

INTERNATIONAL STANDARD

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**Framework for energy market communications –
Part 301: Common information model (CIM) extensions for markets**

**Cadre pour les communications pour le marché de l'énergie –
Partie 301: Extensions du modèle d'information commun (CIM) pour les marchés**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –**Part 301: Common information model (CIM) extensions for markets****FOREWORD**

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International Standard IEC 62325-301 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This second edition cancels and replaces the first edition published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Environmental weather support
- b) Demand-side communication for North American markets
- c) Transparency regulations and flow-based market coupling along with network codes support for European Markets
- d) Registered resource updates.

The text of this standard is based on the following documents:

FDIS	Report on voting
57/1947/FDIS	57/1961/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

Throughout this document, references are made to the UML model. References to specific UML packages and classes are made by citing the name of package or class in single quotes, example, 'IEC 61970' or 'IdentifiedObject'.

A list of all parts of the IEC 62325 series, under the general title: *Framework for energy market communications*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 62325 is one of a series of standards for deregulated energy market data exchanges. This standard series was originally based upon the work of the European transmission system operators TF 14 EDI (Electronic data interchange) and the Electric Power Research Institute (EPRI) TR 1009455 and TR 1011431 (CIM extensions to support market operations, phase 1 and phase 2).

The principal objective of the IEC 62325 series is to produce standards which facilitate the integration of market application software developed independently by different vendors into a market management system, as well as integration of market management systems and market participant systems. This is accomplished by defining message exchanges to enable these applications or systems to access public data and exchange information independent of how such information is represented internally.

The common information model (CIM) specifies the basis for the semantics for this message exchange. The profile specifications, which are contained in other parts of IEC 62325, specify the content of the messages exchanged. Profile specifications in other parts of IEC 62325 support both European style markets based on the European regulations, Third Party Access and zonal market concepts, and North American style markets characterized by day ahead unit commitment by a market operator, intraday and real time balancing through central dispatch, and settlement based on locational marginal prices. These markets are used in the US and in other parts of the world and are not exclusively limited to North America.

The CIM is an abstract model that represents all the major objects in an electric utility enterprise typically needed to model the operational aspects of a utility. This model includes public classes and attributes for these objects, as well as the relationships between them.

The IEC 62325 series are part of a series of standards dealing with the CIM. IEC 61970 defines the EMS application programming interfaces and IEC 61968 defines System interfaces for distribution management. IEC 62325-301 corresponds to IEC 61970-301 and IEC 61968-11 which describe parts of the common information model relevant to modeling interfaces for EMS, DMS and MMS systems. While there are multiple IEC standard series dealing with different parts of the CIM, there is a single, unified information model comprising the CIM behind all these individual standard series.

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 301: Common information model (CIM) extensions for markets

1 Scope

This part of IEC 62325 specifies the common information model (CIM) for energy market communications.

The CIM is an abstract model that represents all the major objects in an electric utility enterprise typically involved in utility operations and electricity market management. By providing a standard way of representing power system resources as object classes and attributes, along with their relationships, the CIM facilitates the integration of market management system (MMS) applications developed independently by different vendors, between entire MMS systems developed independently, or between an MMS system and other systems concerned with different aspects of market management, such as capacity allocation, day-ahead management, balancing, settlement, etc.

The CIM facilitates integration by defining a common language (i.e. semantics) based on the CIM to enable these applications or systems to access public data and exchange information independent of how such information is represented internally.

The object classes represented in the CIM are abstract in nature and may be used in a wide variety of applications. The use of the CIM goes far beyond its application in a market management system.

Due to the size of the complete CIM, the object classes contained in the CIM are grouped into a number of logical packages, each of which represents a certain part of the overall power system being modeled. Collections of these packages are progressed as separate international standards. This particular document specifies a set of packages which provide a logical view of the functional aspects of market management within an electricity market, and other functional aspects including environmental aspects that are closely related to electricity markets and that are shared between all applications. Other standards specify more specific parts of the model that are needed by only certain applications. Subclause 4.2 provides the current grouping of packages into standards documents.

This new edition of IEC 62325-301 contains support for demand-side communication within a wholesale market. The IEC 62325-301 additions include support for demand-side resource registration and enrollment of a market participating resource as well as support for deployment and performance evaluation of demand side resources. A new package has been included in this edition of IEC 62325-301 to support environmental (weather) data. This new package 'Environmental' provides support for weather conditions including forecasts, observations, measurements, phenomena, and alerts. Additional updates have been added within the 'MarketManagement' package to support the transparency regulations, flow based market coupling and new network codes to support the European Markets. These updates include new classes, attributes and associations within the IEC 62325 packages as well as updates to existing classes, attributes and associations to accurately represent the existing use cases.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61968-11, *Application integration at electric utilities – System interfaces for distribution management – Part 11: Common information model (CIM) extensions for distribution*

IEC TS 61970-2:2004, *Energy management system application program interface (EMS-API) – Part 2: Glossary*

IEC 61970-301, *Energy management system application program interface (EMS-API) – Part 301: Common information model (CIM) base*

IEC 61970-302, *Energy management system application program interface (EMS-API) – Part 302: Common information model (CIM) for dynamics*

IEC 62325-450, *Framework for energy market communications – Part 450: Profile and context modelling rules*

Object management group: *UML 2.0 specification* – available at <<http://www.omg.org>>

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in IEC TS 61970-2 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 Terms and definitions

3.1.1

application program interface

API

set of public functions provided by an executable application component for use by other executable application components

[SOURCE: IEC 61970-2:2004, 3.4]

3.1.2

extensible markup language

XML

markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable

3.1.3

XML schema description

XSD

XML-based language used to describe and control XML document contents

3.1.4

intra-day markets

intra-day scheduling markets which refine the commitment and schedules produced by the day ahead markets

3.1.5

load forecast

load forecast system which predicts load for the specified time horizon

3.1.6

locational marginal price

LMP

marginal cost (currency/MWh) of serving the next increment of demand at a pricing node consistent with existing transmission constraints and the performance characteristics of the resources

3.1.7

market management system

MMS

computer system comprising a software platform that provides basic support services and a set of applications with the functionality needed for the effective management of the electricity market

Note 1 to entry: These software systems in an electricity market may include support for capacity allocation, scheduling energy, ancillary or other services, real-time operations and settlements.

3.1.8

scheduler

scheduling system for resources that produce, consume, or transport energy or ancillary services in an energy market

3.1.9

third party access

concept in market management systems which allows third parties to use the transmission system on an equal basis

3.1.10

unified modeling language

UML

modeling language in the field of object-oriented software engineering that is maintained by the Object Management Group

3.1.11

RDF schema

RDFS

W3C recommendation which provides basic elements for the description of ontologies

3.1.12

ontology web language

OWL

W3C recommendation which provides a knowledge representation language for authoring ontologies

3.2 Abbreviated terms

CRR	congestion revenue rights
DAM	day ahead market which determines the commitment and schedules of resources
DMS	distribution management system
EMS	energy management system
MDMS	meter data management system
RTM	real time markets which finalize dispatch for system resources

4 CIM specification

4.1 CIM modeling notation

The CIM is defined using object-oriented modeling techniques. Specifically, the CIM specification uses the unified modeling language (UML) notation, which defines the CIM as a group of packages.

Each package in the CIM contains one or more class diagrams showing graphically all the classes in that package and their relationships. Each class is then defined in text in terms of its attributes and relationships to other classes.

The UML notation is described in the Object Management Group (OMG) standard and several published textbooks.

4.2 CIM packages

The CIM is partitioned into a set of packages. A package is a general purpose means of grouping related model elements. The packages have been chosen to make the model easier to design, understand and review. The common information model consists of the complete set of packages. Entities may have associations that cross many package boundaries. Each application may use information represented in several packages.

The comprehensive CIM is partitioned into groups of packages for convenience in managing and maintaining them. IEC 62325-301 includes the following packages:

- 'MarketCommon'
- 'MarketManagement'
- 'MarketOperations'
- 'Environmental'

Packages used by IEC 61970-301 and packages used by IEC 61968-11 describe additional parts of the CIM that deal with other logical views of utility operations including network models, generation, load, outages, assets, location, activities, consumers, documentation, work management.

NOTE The package boundaries do not imply application boundaries. An application may use CIM entities from several packages.

The IEC 62325-301 is published based on an agreed upon stable version of IEC 61970 and IEC 61968.

Figure 1 shows package dependencies. The 'IEC 62325' package and its subpackages depend on the 'IEC 61970' and 'IEC 61968' packages. The 'IEC 61970' package is used by the IEC 61970 series of standards as a core model that represents power system resources and their relationships. The 'IEC 61968' package is used by the IEC 61968 series of standards describing logical views of utility operations, including assets, location, activities, customers, documentation, work management and metering models. The dashed line indicates a dependency relationship, with the arrowhead pointing from the dependent package to the package on which it has a dependency.

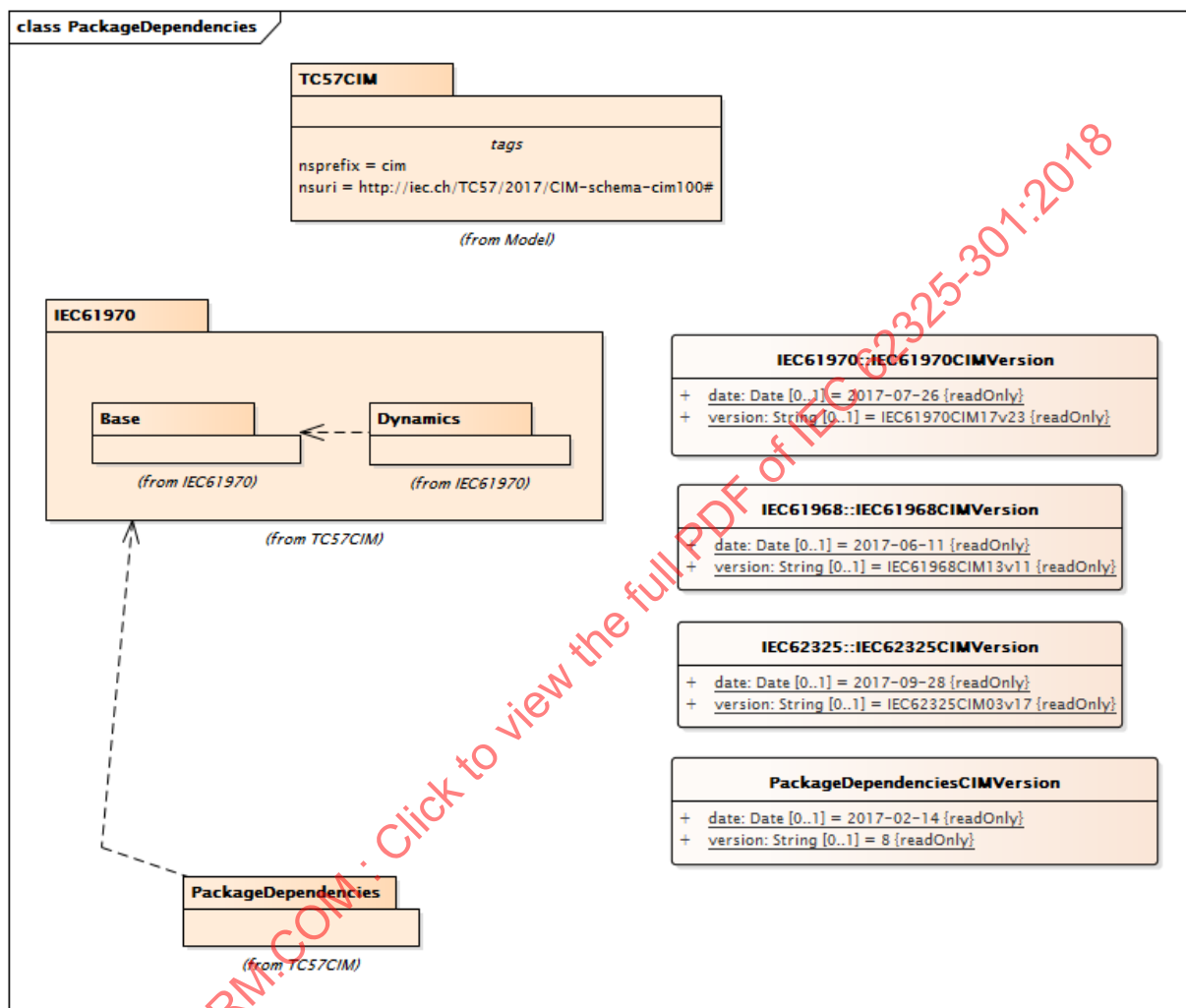


Figure 1 – 'TC 57CIM' package dependency diagram

Figure 2 shows the packages defined for IEC 62325-301 and their dependency relationships. The dashed line indicates a dependency relationship, with the arrowhead pointing from the dependent package to the package on which it has a dependency. The IEC 62325 packages include dependencies upon packages from the IEC 61970 series and the IEC 61968 series. These dependencies are shown in the diagram.

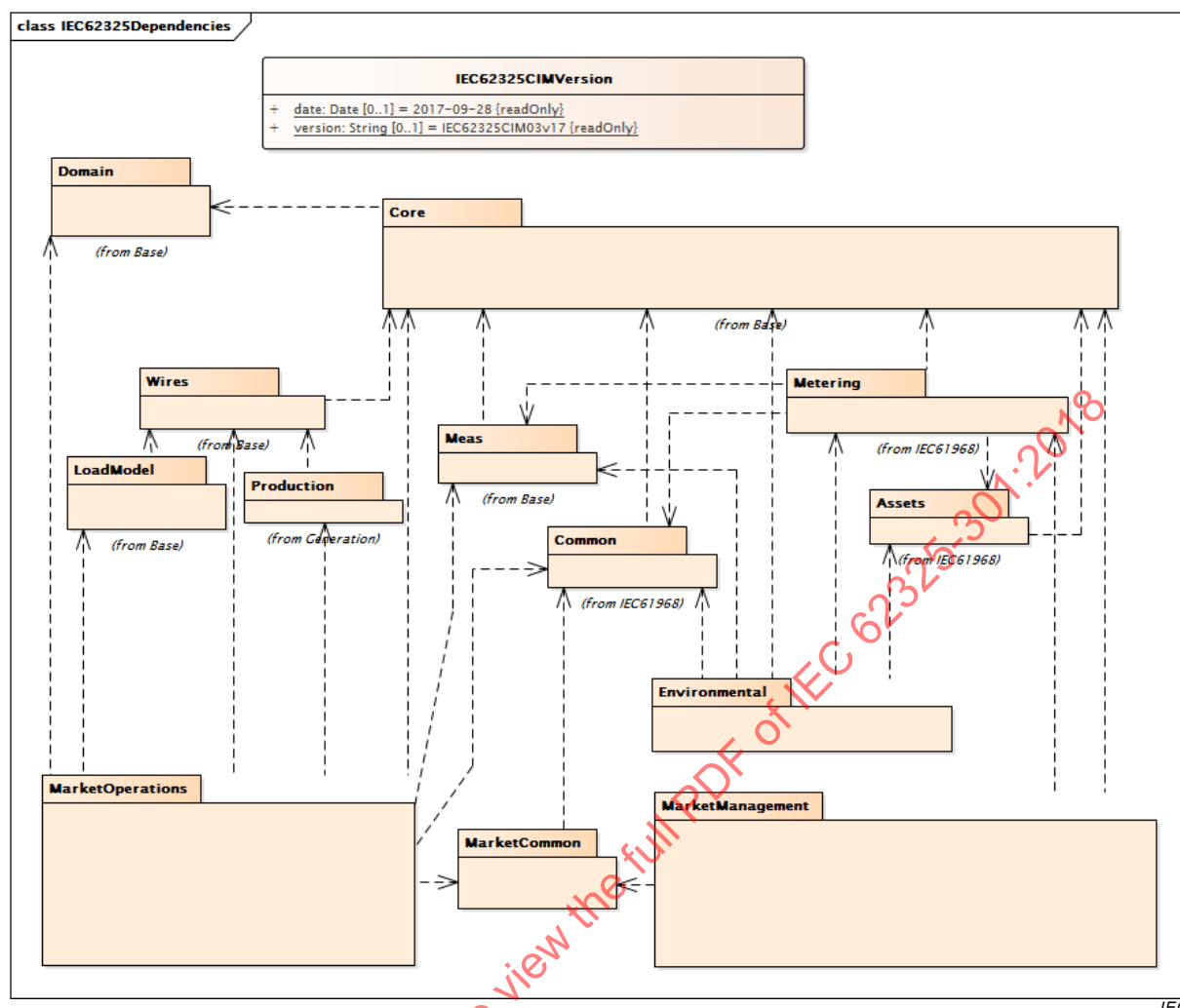


Figure 2. – ‘IEC 62325’ package dependency diagram

Clause 6 contains the specification for each of the CIM packages.

NOTE The contents of the CIM defined in this specification were auto-generated from the CIM UML electronic model release IEC62325CIM03v17, which is available through the CIM Users Group.

4.3 CIM classes and relationships

4.3.1 Classes

The class diagram(s) for each CIM package show(s) all the classes in the package and their relationships. Where relationships exist with classes in other packages, those classes are also shown.

Classes and objects model what is in a power system that needs to be represented in a common way to market applications. A class is a description of an object found in the real world, such as a bid, registered resource, or registered load that needs to be represented as part of the overall electricity market in an MMS. Other types of objects include things such as schedules and measurements that MMS applications also need to process, analyze, and store. Such objects need a common representation to achieve the purposes of this standard for plug-compatibility and interoperability. A particular object in a power system with a unique identity is modeled as an instance of the class to which it belongs.

In this document when a header includes the term “root class”, it means the class does not have inheritance and does not have a stereotype.

The CIM is defined to facilitate data exchange. As defined in this document, CIM entities have no behavior. IEC 62325-450, *Framework for energy market communications – Part 450: Profile and context modeling rules* defines the modeling principles to generate a profile and the modeling framework principles to define the message payload.

Classes have attributes that describe the characteristics of the objects. Each class in the CIM contains the attributes that describe and identify a specific instance of the class. Only the attributes that are of public interest to MMS applications are included in the class descriptions.

Each attribute has a type, which identifies what kind of attribute it is. Typical attributes are of type ‘Integer’, ‘Float’, ‘Boolean’, ‘String’, ‘Datetime’, ‘Date’, ‘Duration’, and ‘Decimal’, which are called primitive types. However, many additional types are defined as part of the CIM specification. For example, ‘RegisteredGenerator’ has a “maxDependableCap” attribute of type ‘ActivePower’. The definition of many shared types is contained in the ‘Domain’ package described in Clause 6. The UML stereotypes of ‘Primitive’, ‘enumeration’, ‘CIMDatatype’, and ‘Compound’ are added to classes used as types:

- The ‘CIMDatatype’ stereotype is used with a specific CIM semantic to describe a type that has several attributes {‘value’, ‘unit’, ‘multiplier’, ‘denominatorUnit’, ‘denominatorMultiplier’}, which implies custom mapping to serialization artifacts such as RDFS, OWL, and XSD. Classes with these stereotypes do not participate in generalization or association relationships and are simply used as types for attributes.
- The ‘enumeration’ stereotype is used to describe the type of an attribute with an enumerated list of choices.
- The ‘Compound’ stereotype is used to describe sets of related attributes that are commonly reused. ‘Compound’ classes may consist of attributes whose types are ‘Primitive’, ‘enumeration’, ‘CIMDatatype’ or other ‘compound’ classes as long as the ‘compound’ classes do not recurse.

All CIM attributes are implicitly optional in the sense that profiles using the CIM may eliminate any attributes.

Relationships between classes reveal how they are structured in terms of each other. CIM classes are related in a variety of ways, as described in 4.3.2, 4.3.3 and 4.3.4.

4.3.2 Generalization

A generalization is a relationship between a more general and a more specific class. The more specific class can contain only additional information. For example, ‘RegisteredGenerator’ is a specific subclass of ‘RegisteredResource’. Generalization provides for the specific class to inherit attributes and relationships from all the more general classes above it.

Figure 3 is an example of generalization. In this example taken from the ‘MarketCommon’ package, a ‘MarketParticipant’ is a more specific type of ‘Organisation’. ‘Organisation’ also inherits from ‘IdentifiedObject’.

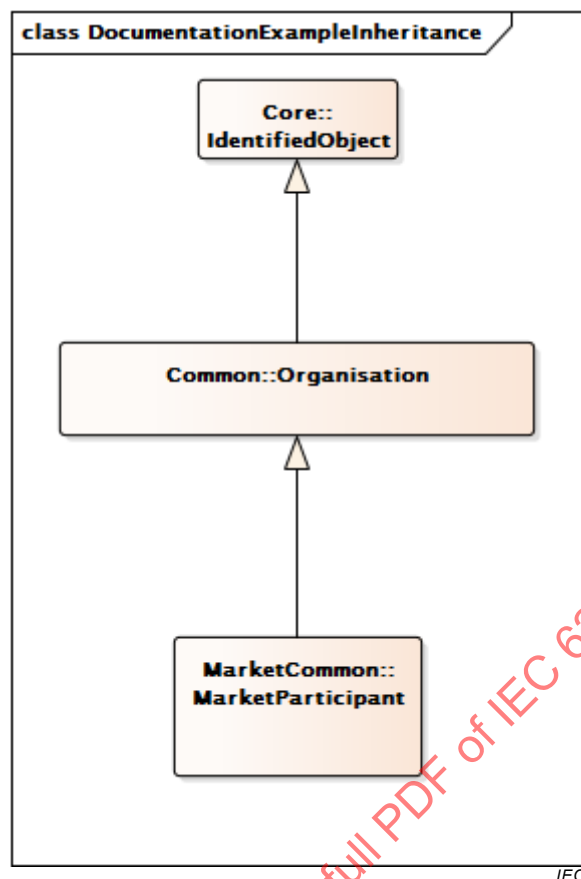


Figure 3 – Example of generalization

4.3.3 Simple association

An association is a conceptual connection between classes. Each association has two “association ends”. The “association ends” were called “roles” prior to the *UML 2.0 specification*. Each association end describes the role the target class (i.e., the class the association end goes *to*) has in relation to the source class (i.e., the class the association end goes *from*). Association ends are usually given the name of the target class with or without a qualifier term (verb, noun, adverb) phrase. Each association end also has multiplicity/cardinality, which is an indication of how many objects may participate in the given relationship. In the CIM, associations are not named, only association ends are named. For example, in the CIM there is an association between a ‘MarketParticipant’ and ‘MarketRole’ (see Figure 4 which is taken from the ‘MarketCommon’ package). Multiplicity is shown at both ends of the association. In this example, a ‘MarketParticipant’ object may reference 0 or more ‘MarketRole’ objects and a ‘MarketRole’ may be referenced by 0 or more ‘MarketParticipant’ objects.

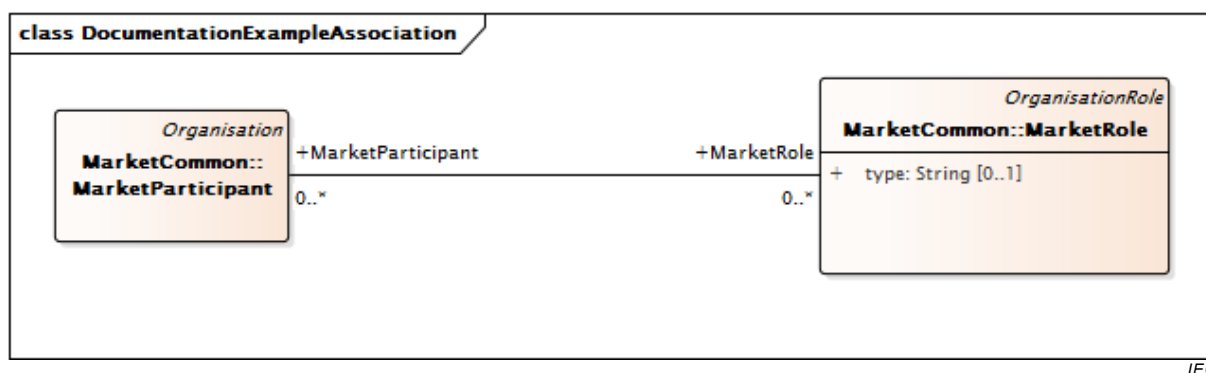


Figure 4 – Example of simple association

4.3.4 Aggregation

Aggregation is a special case of association. Aggregation indicates that the relationship between the classes is some sort of whole-part relationship, where the whole class “consists of” or “contains” the part class, and the part class is “part of” the whole class. The part class does not inherit from the whole class as in generalization. Figure 5 illustrates an aggregation between the ‘EnergyProfile’ class and the ‘EnergyTransaction’ class, which is taken from the ‘ExternalInputs’ package. As shown, an ‘EnergyProfile’ can be a member of one ‘EnergyTransaction’ object, but an ‘EnergyTransaction’ object can contain any one or more of ‘EnergyProfile’ objects. In the context of using CIM as an information model, aggregation does not have a precise or formal interpretation beyond a simple association and is intended to visually assist in representing normal usage.

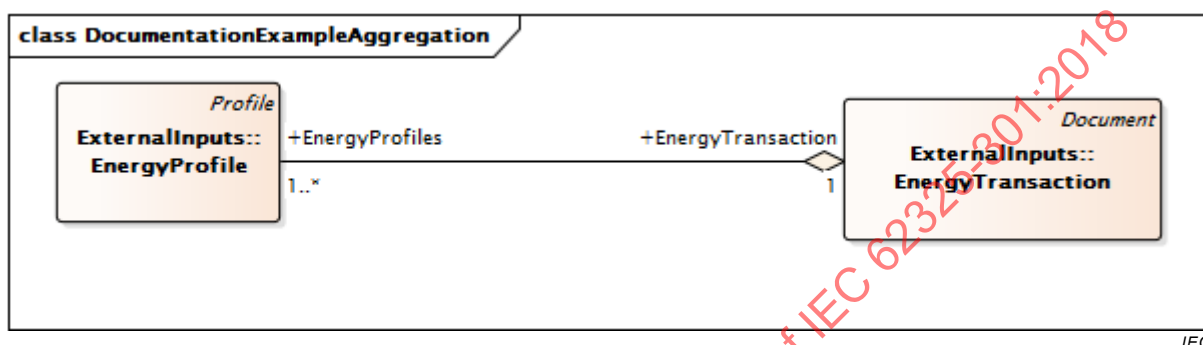


Figure 5 – Example of aggregation

4.4 CIM model concepts and examples

4.4.1 ‘MarketCommon’ package

The common market model describes the market participants and the role they are assuming in the market. A market participant could play several roles in a market, as shown in Figure 6.

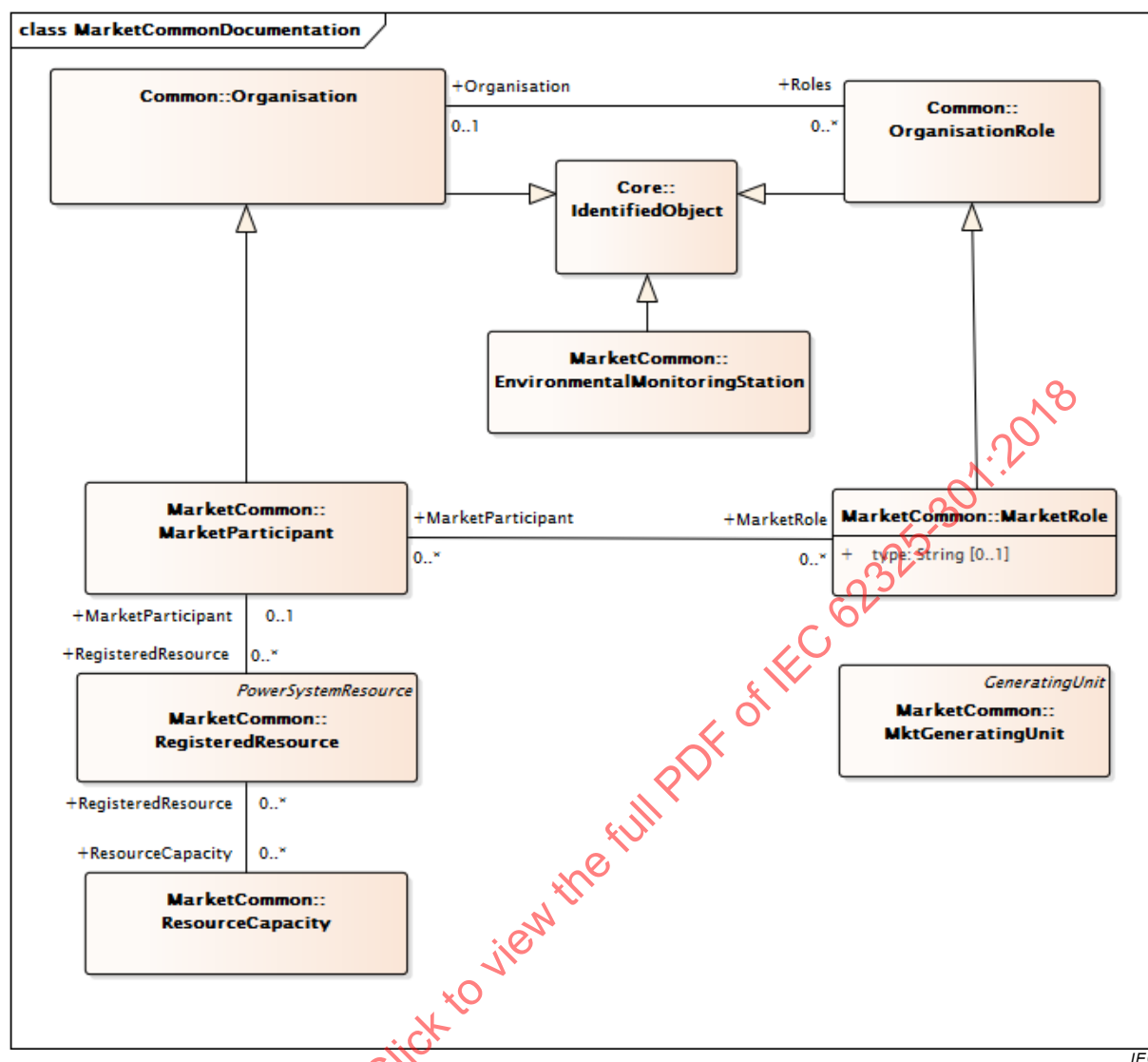


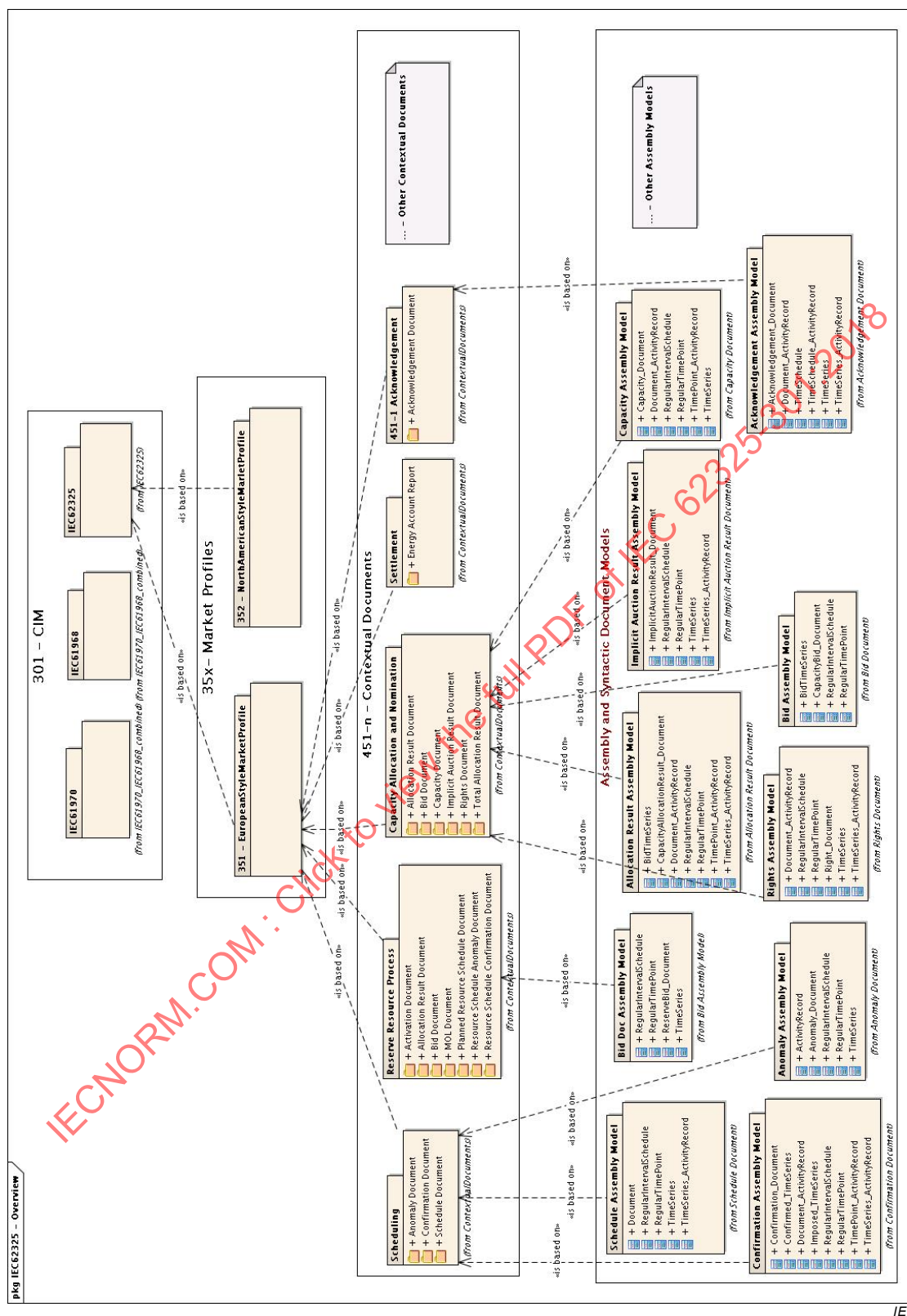
Figure 6 – Common market model

4.4.2 'MarketManagement' package

The market management model describes a consistent set of classes to be used together with the common market model to generate a profile. The profile is to be used when the electricity market is mainly based on regulated Third Party Access, i.e. transmission system operators have to allow any electricity supplier non-discriminatory access to:

- the transmission network to supply customers
- the infrastructure that enables the exchange of energy by wholesale and retail transactions (bilateral or through a power exchange)

The 'MarketManagement' package refers to what is later called the European style market. Figure 7 shows an overview of the layered modeling framework that enables the specification of messages from the CIM down through the different layers. This layered modeling framework defines how the concepts of the 'MarketManagement' package originate from the CIM through the definition of a market profile that enables the generation of contextualized documents for information exchange.



IEC

Figure 7 – Market management model overview

As shown in Figure 7, for each business process necessary to run an electricity market, a dedicated set of contextualized documents is provided. As indicated in Figure 7, the market profiles are specified in IEC 62325-351 and the contextual documents are described in IEC 62325-451-1, IEC 62325-451-2, etc.

Figure 8 shows the classes of the 'MarketManagement' package.

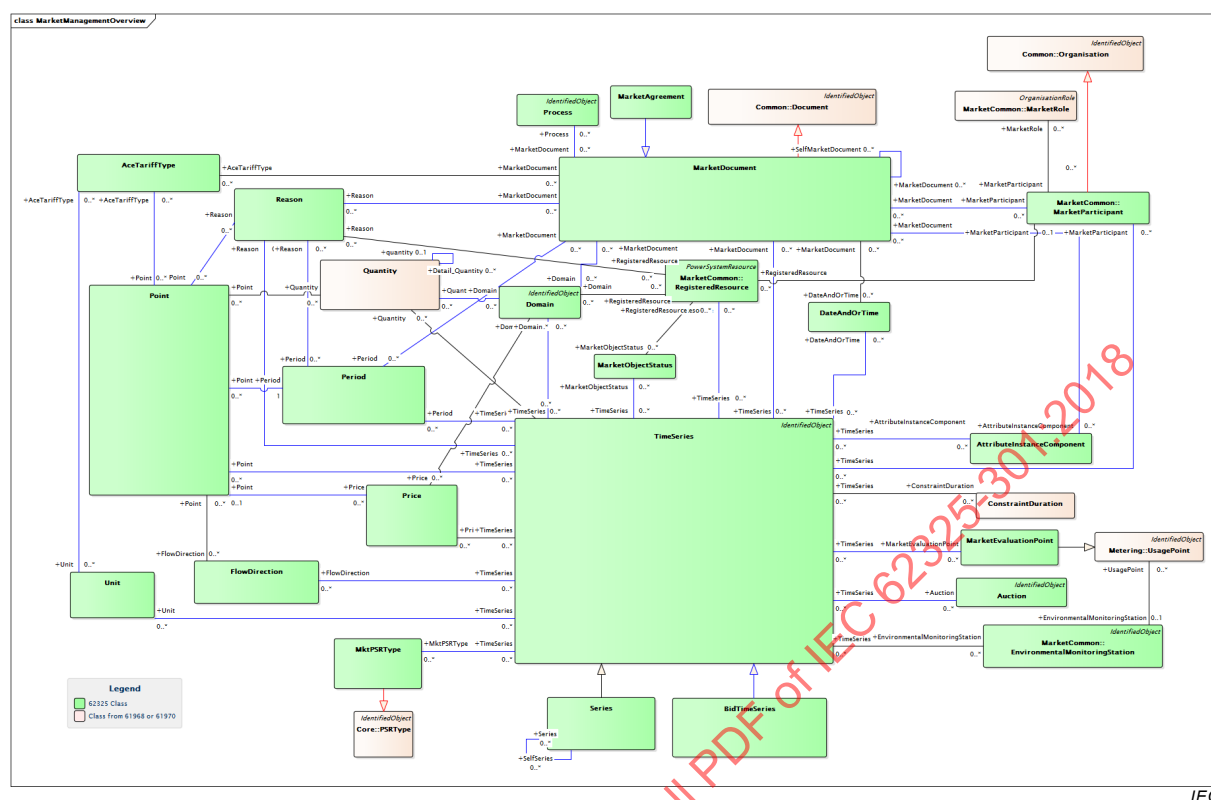


Figure 8 – Market management model

In this market management model a key role is given to the concept of 'MarketDocument', i.e. the transactions on the electricity market are based on contractual exchanges of information between market participants through a given set of documents depending upon the business process.

As shown in Figure 7, for each business process necessary to run an electricity market, a dedicated set of contextualized documents is provided. As an example, here is a non-exhaustive list of processes:

- the acknowledgment process: As the information exchange is based on contractual exchanges, it is required to have a functional acknowledgment for the exchanged document, and not only a technical acknowledgment;
- the scheduling process: This process describes the way of exchanging information related to schedules, i.e. generation schedules, load schedules, bilateral trade schedules, power exchanges trade schedules, etc.;
- the settlement process: This process describes how to exchange the information necessary to settle the electricity market, i.e. the comparison of the scheduled energy and the actual meters;
- the transmission capacity allocation and nomination process: This process describes the explicit and implicit auctions of transmission capacity for cross border trades. It includes also the secondary market of capacity rights, i.e. the resale of capacity rights;
- the reserve resource process: This process describes the way resources, i.e. the generation units and the dispatchable load, are scheduled, and capacity is auctioned and in particular the activation by the system operator of the tertiary reserve for balancing purpose;
- etc.

Within a 'MarketDocument', another important concept is the 'TimeSeries' concept (see Figure 9) based on which market participants (i.e. 'MarketParticipant' class) playing a role (i.e. 'MarketRole' class) in a market business process (i.e. 'Process' class) can exchange schedules of volume/price related to an energy domain area (i.e. 'Domain' class) for a given business type (such as "internal trade", "cross-border trade", "primary reserve", "secondary reserve", "tertiary reserve", etc.). These documents are the basis on which all exchanges are built in order to manage energy exchanges, bid, capacity allocation, energy reserve resources, and settlement.



Figure 9 – ‘MarketManagement’ ‘TimeSeries’ core concept

A specialization of the TimeSeries class is defined in order to provide an appropriate way to describe the configuration of a market object and the interrelation between these objects and market participants. This class is named Series.

To handle quantities and prices in a contractual way for the electricity market, attributes of type 'Decimal' have been introduced in the modeling process.

4.4.3 'MarketOperations' package

4.4.3.1 Market operations

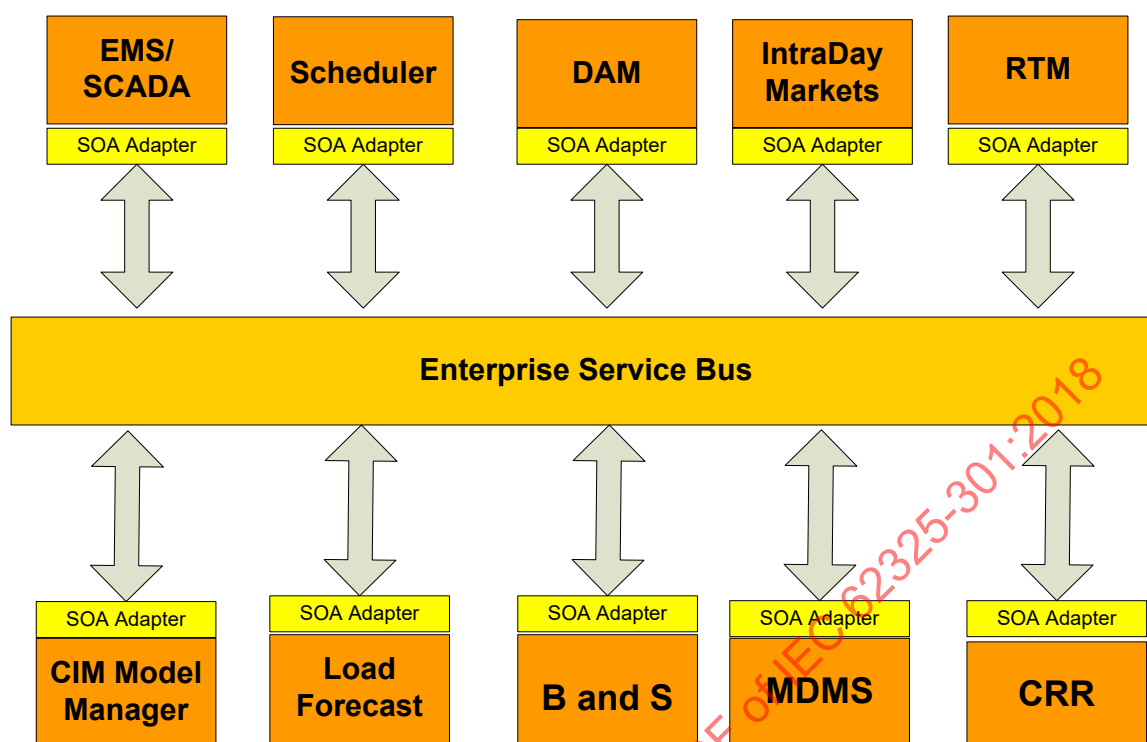
The 'MarketOperations' package describes a consistent set of classes to be used together with the common market model (and other parts of the CIM described in IEC 61970-301 and IEC 61968-11) to generate a profile. The profile, in such a case, is to be used for North American style electricity market that is mainly characterized by day ahead unit commitment by a market operator, intraday and real time balancing through central dispatch, and settlement based on locational marginal prices (LMPs).

This kind of North American style electricity market also includes the auction of congestion revenue rights which are financial instruments that market participants purchase to hedge against congestion costs. Meter data management and billing and settlement are also included. The 'MarketOperations' package includes models to support these characteristics.

Subclauses 4.4.3.2 through 4.4.3.6 describe major concepts referenced in the 'MarketOperations' package.

4.4.3.2 Market operator software systems

Figure 10 shows the software systems of a typical operator of North American style electricity markets that are referenced in the 'MarketOperations' package. The market operator may also be known as a regional transmission operator (RTO) or independent system operator (ISO). The systems are identified as follows:



IEC

Figure 10 – Market operator software systems for North American style electricity markets

4.4.3.3 Regional transmission operator interfaces

Figure 11 illustrates an overview of the UML interface model for a regional transmission operator (RTO) to support the interfaces illustrated in Figure 10. The major classes are briefly summarized: The classes 'AggregateNode' and 'Pnode' are used to model pricing nodes where locational marginal prices are averaged with a weighted average calculation. The class 'LocalReliabilityArea' is used to identify and model load pockets within the RTO. The class 'MktConnectivityNode' is used to extend the IEC 61970 'ConnectivityNode' class with market data. The classes 'TransmissionRightChain', 'ContractRight', and 'MSSAggregation' are used to model legacy contracts for use of the transmission system and to represent grandfathered transmission ownership rights. The classes 'Organisation' and 'MarketParticipant' identify the RTO. The classes 'SecurityConstraints' and 'SecurityConstraintSum' are used to model system constraints such as nomograms that approximate transient stability constraints. The classes 'HostControlArea', 'SubControlArea', and 'AdjacentCAsSet' are used to model data to support control area operations. Resource models and participating transmission owner data are included through associations with their associated classes. More details of the RTO model are included in Clause 6.



4.4.3.4 Resource model

Figure 12 illustrates a high level view of the UML model that supports the resource model data for North American style electricity market. The class 'RegisteredResource' is a parent class with the following subclasses: 'RegisteredLoad', 'RegisteredInterTie', 'RegisteredGenerator' and 'RegisteredDistributedResource'. The 'RegisteredResource' class has associations with the classes 'AggregateNode', 'Pnode' and 'MktConnectivityNode' to support aggregated and physical resources. The associations to the 'AggregateNode' and to 'AggregatedPnode' (association is inherited from 'Pnode') support the aggregated resource definition on an aggregated node or aggregated pricing node basis. The associations to 'IndividualPnode' (inherited from 'Pnode') and 'MktConnectivityNode' support the physical resource definition on a pricing or connectivity node basis.



4.4.3.5 Bid/Offer model

Figure 13 shows the overview of the classes and associations that are used to model offers and bids. The term bid is used to include offers to sell and bids to buy one or more electricity products. The 'Bid' class is a subclass of the 'Document' class from the 'IEC 61968' package. Bids are further classified as 'ResourceBids' or 'TransactionBids'. 'Resource' bids are bids that are based on physical (or virtual) resources that are inside the footprint of the RTO and thus under the direct operational control of the RTO. 'TransactionBids' are bilateral agreements made between market participants that are reported to the RTO for inclusion as constraints in the market clearing. The RTO determines whether the bilateral agreements can be consummated while maintaining system reliability standards.

Bids are associated with market participants. Scheduling coordinators fulfil a specialized role of a market participant that submits bids on behalf of market participants. Each 'Bid' class

must be associated to one 'MarketParticipant'. This 'MarketParticipant' may be represented by a 'SchedulingCoordinator' as 'SchedulingCoordinator' inherits from 'MarketParticipant'.

The bid class has a relationship to the 'BidProduct' class and to the 'MarketProduct' classes. These associations are used to model the submittal of bids for energy and ancillary services. A further association between the 'Bid' class and the 'Market' class indicates which market the bid is intended for (day ahead, real time, etc.).

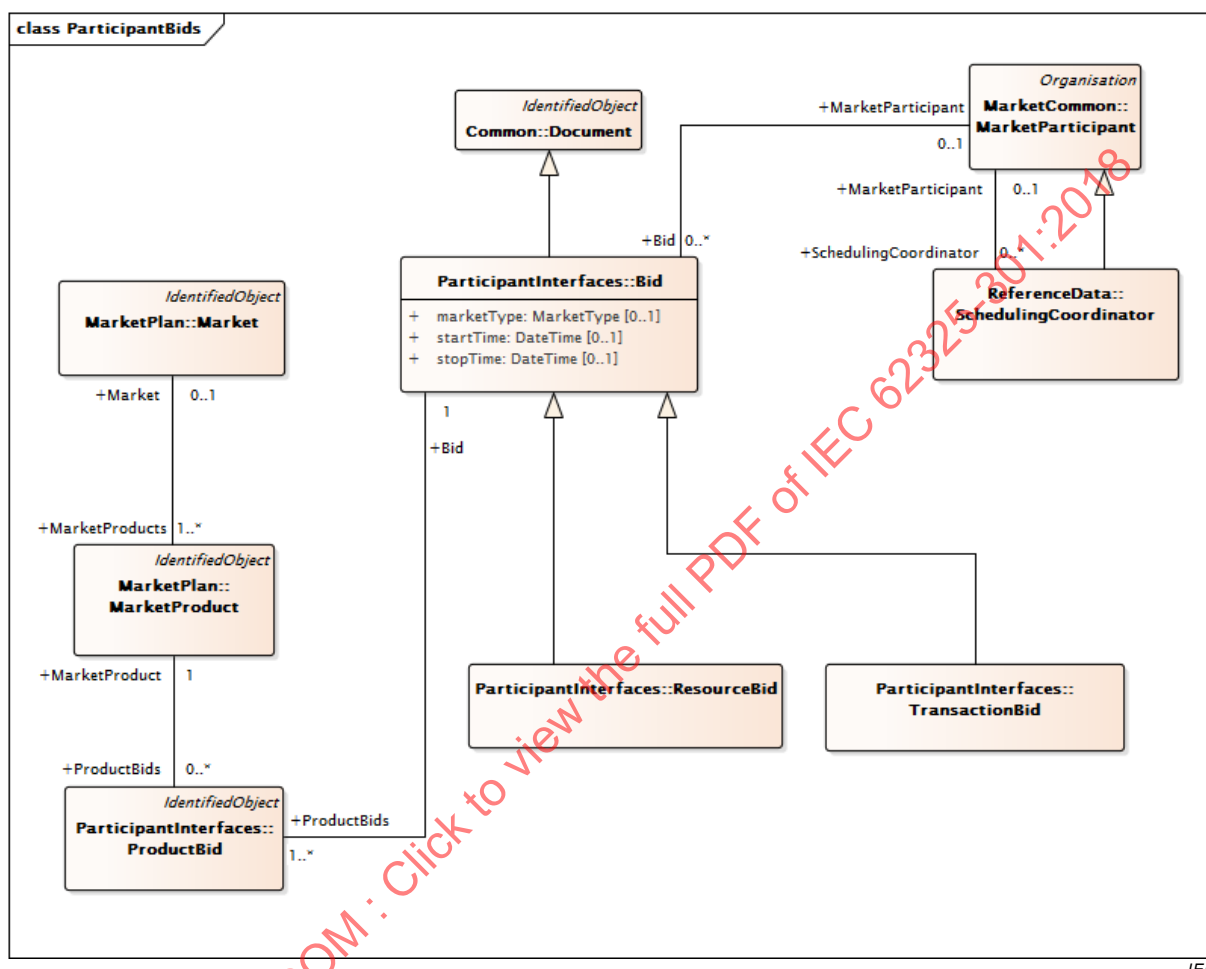


Figure 13 – Bid definition for North American style electricity market

Figure 14 shows further details of bids/offers.

The 'Bid' class is associated with a 'ProductBid' class, which in turn is associated with the 'BidPriceSchedule' class. The class 'BidPriceSchedule' defines bid schedules to allow a product bid to use specified bid price curves for different time intervals. This simplifies the modeling of bids that are made for multi-interval time horizons. The bid schedule is the set of consecutive intervals for which the bid is valid.

A bid may also be a self schedule, meaning that the market participant would like to operate the resource according to a certain (for example minimum) schedule. The market operator determines whether this resource can run with the submitted self schedule while system reliability criteria are met. These self schedules are settled at the LMPs determined during the market clearing. The class 'Bid' is associated with the class 'ProductBid', which is associated with the class 'BidSelfSchedule' to support the modeling of self schedules. The class 'BidSelfSched' is associated with the class 'ContractRight' which may be used to model the use of legacy contracts to support self schedules.

This model also supports bids with part of the range of bid classified as a self schedule and part as regular bid.

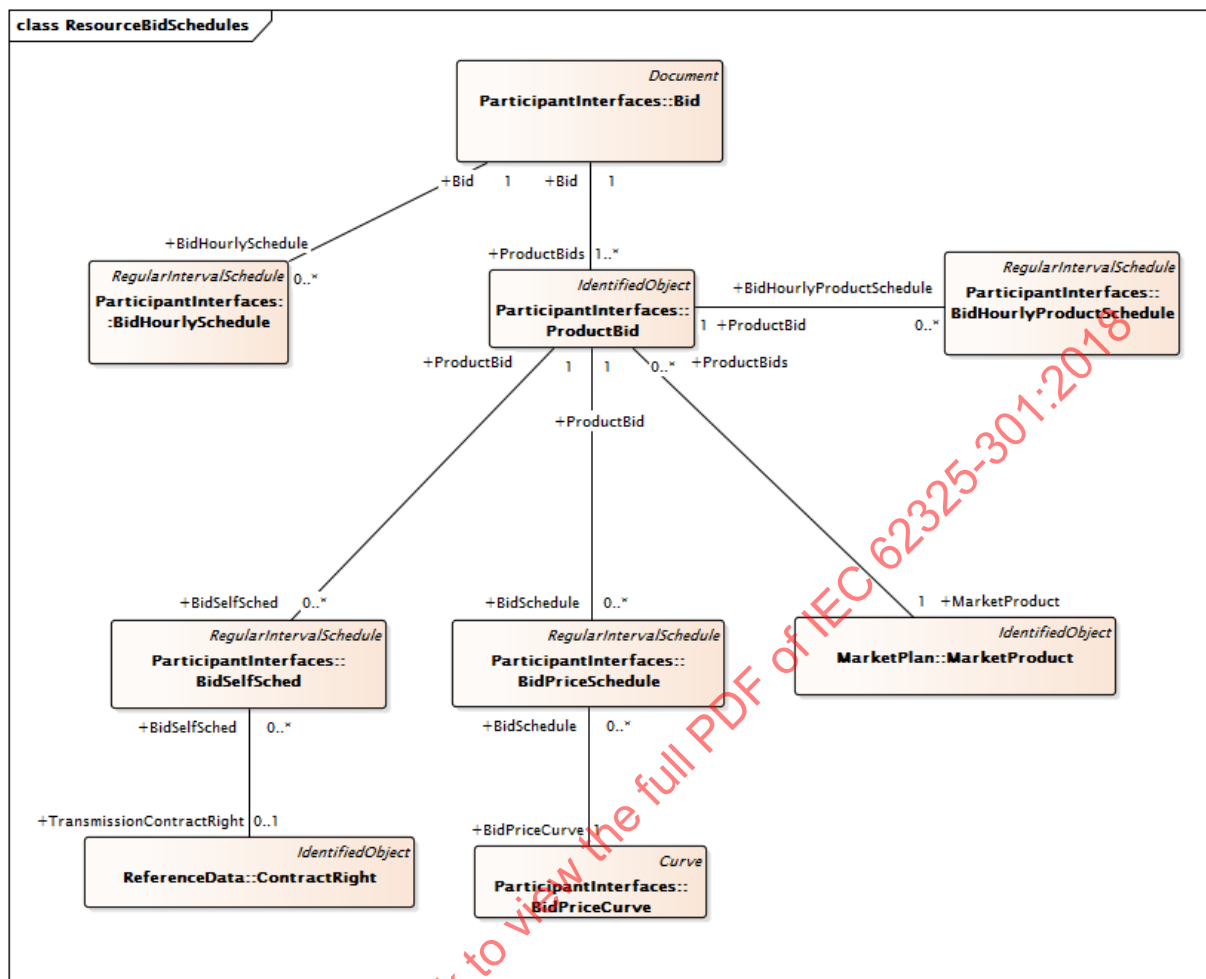


Figure 14 – Resource bid schedule definitions for North American style electricity market

4.4.3.6 Market clearing results

Figure 15 illustrates the major classes used to communicate the results of a market clearing run for a North American style electricity market. The class 'Market' is used to model the type of market (day ahead, real time, or intraday). The class 'MarketFactors' is used to model the market time horizon. The class 'LossClearing' is used to model electrical losses during the market horizon. The class 'GeneralClearing' is used to model the identity of the market interval. The class 'PnodeClearing' and its associations are used to model the cleared prices (locational marginal prices) of the run. The class 'ResourceClearing' is used to model market clearing results on a resource basis. The class 'AncillaryServiceClearing' is used to model the clearing results for ancillary services on a market region basis. The class 'ResourceAwardClearing' is used to model further details of the resource clearing. The class 'ConstraintClearing' is used to model the exchange of data on constraints which are binding constraints in the optimal market clearing solution.

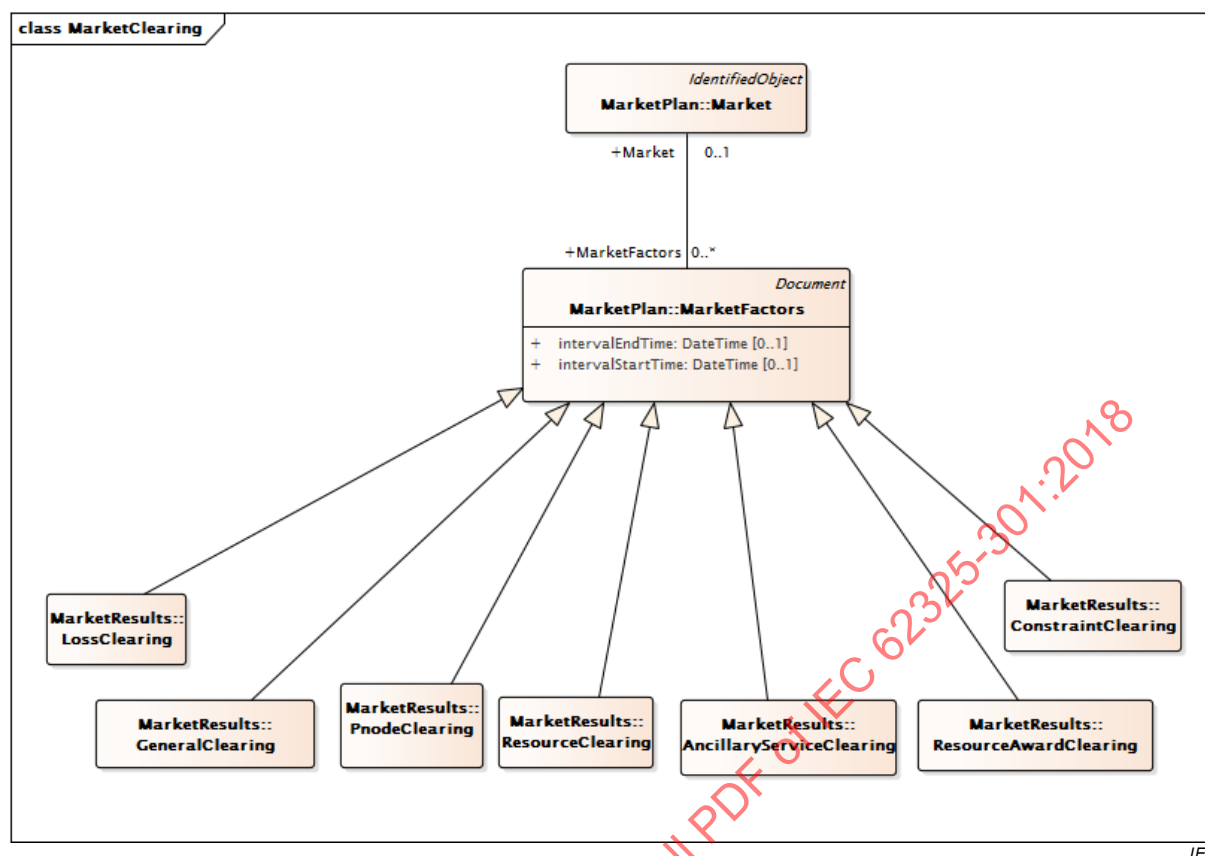


Figure 15 – Market clearing for North American style electricity market

4.4.3.7 Demand-Side Communication

Figure 16 illustrates the major classes used to communicate information between demand-side resources (demand response resources, storage resources, distribution generation resources, etc.) and the markets. The class 'RegisteredDistributedResource' is used to model the resource and is a new specialization of the 'RegisteredResource' class. The class 'ResourceCertification' is used to model different markets or services which the demand-side resource is qualified to provide; for example a demand response resource might be qualified to provide 10 MWh of Energy at 10 MW of power while a storage facility of 20 MWh might be qualified to provide 10 MW of up or down Regulation.

The 'MarketActualEvent' class has been extended to model demand-side events which have a targeted start and end time, along with different 'eventType' and 'eventStatus' indicators. The 'DistributedResourceActualEvent' class is a specialization of 'MarketActualEvent' that is used to capture system-wide demand response activity. Another important enhancement to the model is the extension of the 'Instructions' class to include a Dispatch Operating Delta should a relative amount of power be requested (as opposed to or in addition to an absolute power set-point, or Dispatch Operating Target, which was already in the model).

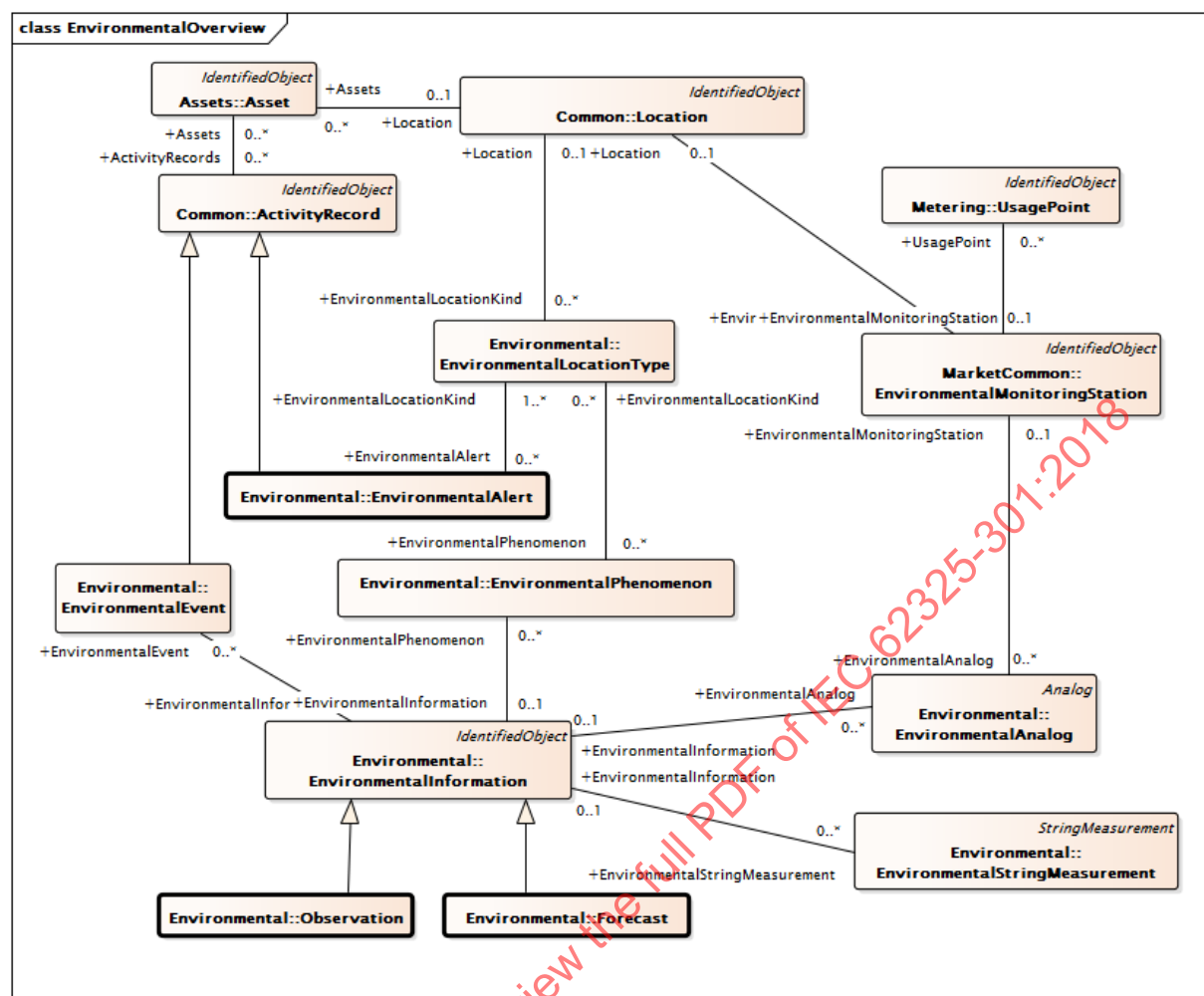
Performance of a demand-side resource is captured in the 'ResourcePerformanceEvaluation' class and may consist of one or more instances of a 'ResourcePerformanceTimeSeriesFactor' such as meter reads, baseline curves, correction curves and/or one or more instances of a 'ResourcePerformanceGlobalFactor' such as a temperature correction or load-offset. Performance over multiple events or dispatches is modeled in the 'ResourcePerformanceRating' class.



Figure 16 – Demand Side Communication for North American style electricity market

4.4.4 Environmental Data

Figure 17 provides an overview of the Environmental package, which contains a model of constructs typically used to describe environmental (weather) conditions including forecasts, observations, measurements, phenomena, alerts and events.

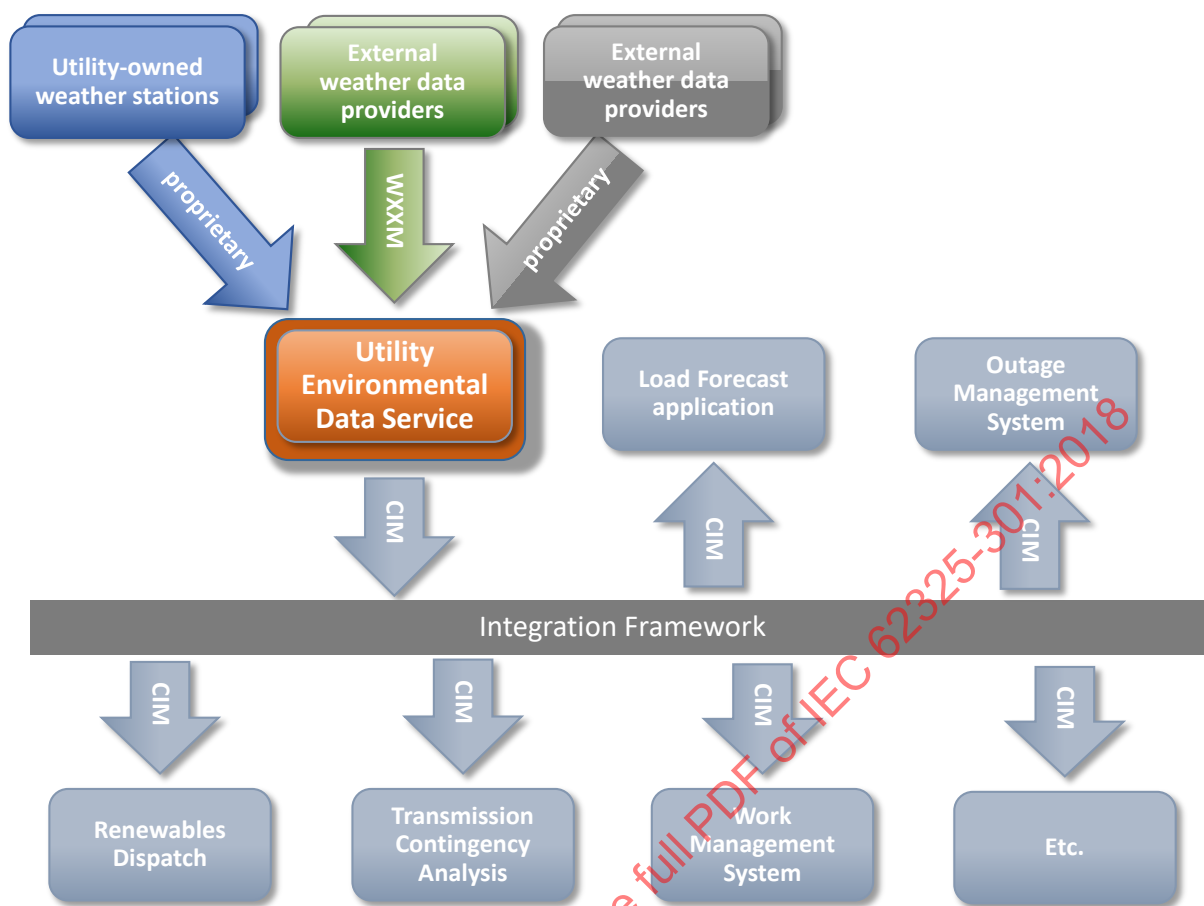


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Figure 17 – Main Environmental classes

Environmental data is used by a diverse range of systems and applications within the power industry, from operations and asset management to customer billing and legal. It is vital to the behaviour of markets and activities as diverse as load and generation forecasting, storm restoration (crew pre-deployment, damage assessment, restoration), responding to environmental events (forest/grass fires, floods, tsunamis), emissions monitoring, geomagnetic induced current monitoring and accident claims investigation.

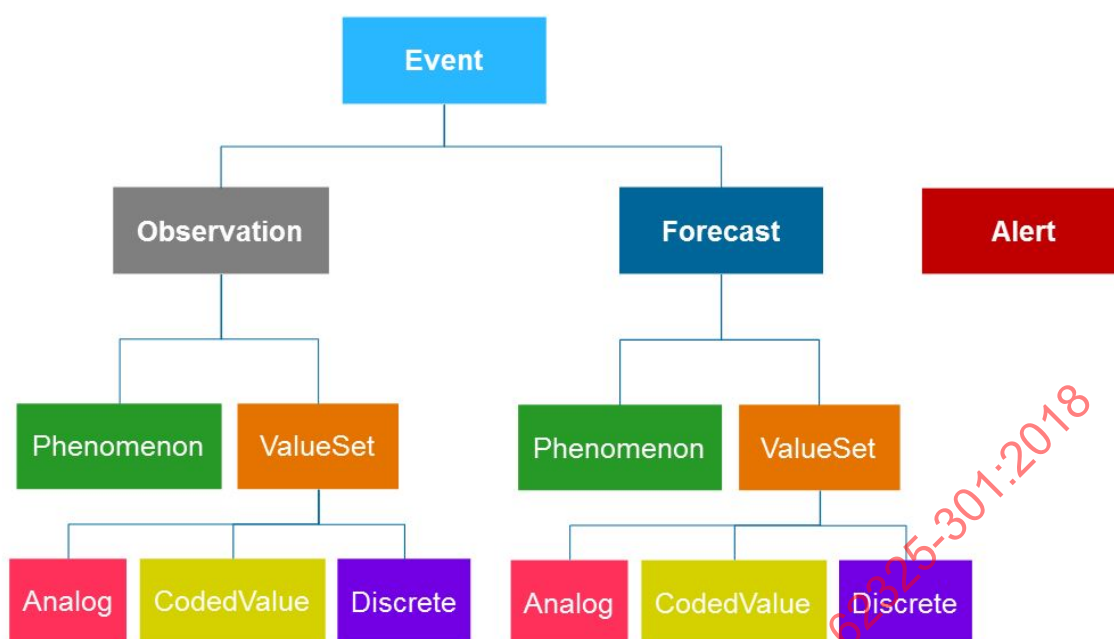
The classes of the Environmental package are intended to support the exchange of environmental data information inside a utility and to facilitate the association of environmental data with other utility enterprise information (location, asset, usage point) to which it might naturally relate. As illustrated in Figure 18, a Utility Environmental Data Service plays a key role in the use cases of environmental data exchange within the utility. The Environmental Data Service receives inputs from a variety of outside sources (in a variety of formats), stores and manages this data over time and provides it as required to a wide range of consuming applications at the utility.



IEC

Figure 18 – Utility Environmental Data Service

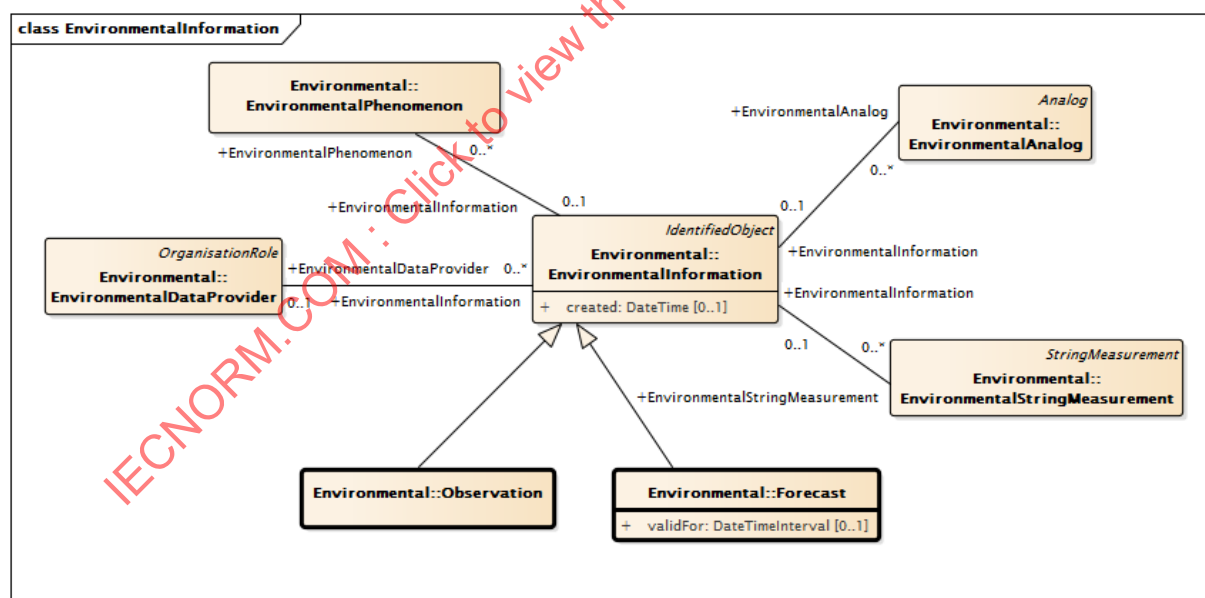
As shown in Figure 19, the four high-level environmental data constructs are observation, forecast, alert and event. These constructs are represented by the 'Observation', 'Forecast', 'EnvironmentalAlert' and 'EnvironmentalEvent' classes respectively. 'Forecast' and 'Observation' are both child classes of 'EnvironmentalInformation' and the organization of data pertaining to each of them is identical.



IEC

Figure 19 – High Level Environmental Data Constructs

As illustrated in Figure 20, each observation or forecast is created at a moment in time, can have a provider and contains any number of measurement values and phenomenon descriptions. Additionally, a forecast has a time for which it is valid. Locational information for forecasts and observations is provided at the measurement or phenomenon level.



IEC

Figure 20 – Forecasts and observations

The measurement model for environment values is shown in Figure 21. Analogs associated with forecasts and observations are subclassed by the region in which they occur (atmospheric, geospheric, hydrospheric or space) and a kind attribute allows explicit definition of the value being measured (for example, atmospheric temperature, water surface temperature, humidity or irradiance). Analogs leverage the statistical calculation definitions provided by the ExtendedAnalog related classes ('CalculationMethodHierarchy', 'CalculationMethodOrder', 'StatisticalCalculation', and 'PeriodicStatisticalCalculation'), which support clear definition of the meaning of an analog value. This allows, for example, an analog to be described as an 'hourly peak of a 5 minute sampling of temperature'.

```

classDiagram
    class MarketCommon {
        class EnvironmentalMonitoringStation
    }
    class Environmental {
        class EnvironmentalInformation {
            +created: DateTime [0..1]
        }
        class EnvironmentalAnalog {
            +kind: AtmosphericAnalogKind [0..1]
            +kind: GeosphericAnalogKind [0..1]
            +kind: HydrosphericAnalogKind [0..1]
            +kind: SpaceAnalogKind [0..1]
        }
        class EnvironmentalDiscrete {
            +kind: EnvironmentalDiscreteKind
        }
        class EnvironmentalStringMeasurement
    }
    class Meas {
        class Measurement {
            +Measurement
        }
        class Analog {
            +Analog
        }
        class Discrete {
            +Discrete
        }
        class StringMeasurement {
            +StringMeasurement
        }
        class AnalogValue {
            +AnalogValues
        }
        class DiscreteValue {
            +DiscreteValues
        }
        class StringMeasurementValue {
            +StringMeasurementValues
        }
    }
    class AssetMeas {
        class CalculationMethodHierarchy {
            +CalculationMethodHierarchy
        }
        class CalculationMethodOrder {
            +CalculationMethodOrder
        }
        class PeriodicStatisticalCalculation
        class StatisticalCalculation
    }
    class IOPoint {
        class MeasurementValueExt
    }
    class MeasurementValue {
        class MeasurementValueExt
    }

    MarketCommon "0..1" -- "0..*" EnvironmentalMonitoringStation : +EnvironmentalMonitoringStation
    Environmental "0..1" -- "0..*" EnvironmentalInformation : +EnvironmentalInformation
    Environmental "0..1" -- "0..*" EnvironmentalAnalog : +EnvironmentalAnalog
    Environmental "0..1" -- "0..*" EnvironmentalDiscrete : +EnvironmentalDiscrete
    Environmental "0..1" -- "0..*" EnvironmentalStringMeasurement : +EnvironmentalStringMeasurement
    Meas "0..*" -- "1" Measurement : +Measurement
    Meas "1" -- "0..*" Analog : +Analog
    Meas "1" -- "0..*" Discrete : +Discrete
    Meas "1" -- "0..*" StringMeasurement : +StringMeasurement
    Meas "0..*" -- "0..*" AnalogValue : +AnalogValues
    Meas "0..*" -- "0..*" DiscreteValue : +DiscreteValues
    Meas "0..*" -- "0..*" StringMeasurementValue : +StringMeasurementValues
    AssetMeas "0..1" -- "1" CalculationMethodHierarchy : +CalculationMethodHierarchy
    AssetMeas "1" -- "0..*" CalculationMethodOrder : +CalculationMethodOrder
    AssetMeas "0..*" -- "1" PeriodicStatisticalCalculation : +StatisticalCalculation
    AssetMeas "1" -- "0..*" StatisticalCalculation : +StatisticalCalculation
    IOPoint --> MeasurementValue : MeasurementValueExt
    MeasurementValue --> MeasurementValue : MeasurementValueExt
    EnvironmentalStringMeasurement --> MeasurementValue : MeasurementValueExt
    EnvironmentalStringMeasurement --> MeasurementValue : MeasurementValueExt
    
```

Figure 21 – Environmental measurements

Environmental monitoring stations, whose model is illustrated in Figure 22, can provide analog values for observations and have their capabilities defined by the 'ReportingCapability' class. The possibility that a monitoring station could be associated with a meter or customer is addressed by an association between 'EnvironmentalMonitoringStation' and 'UsagePoint' classes.

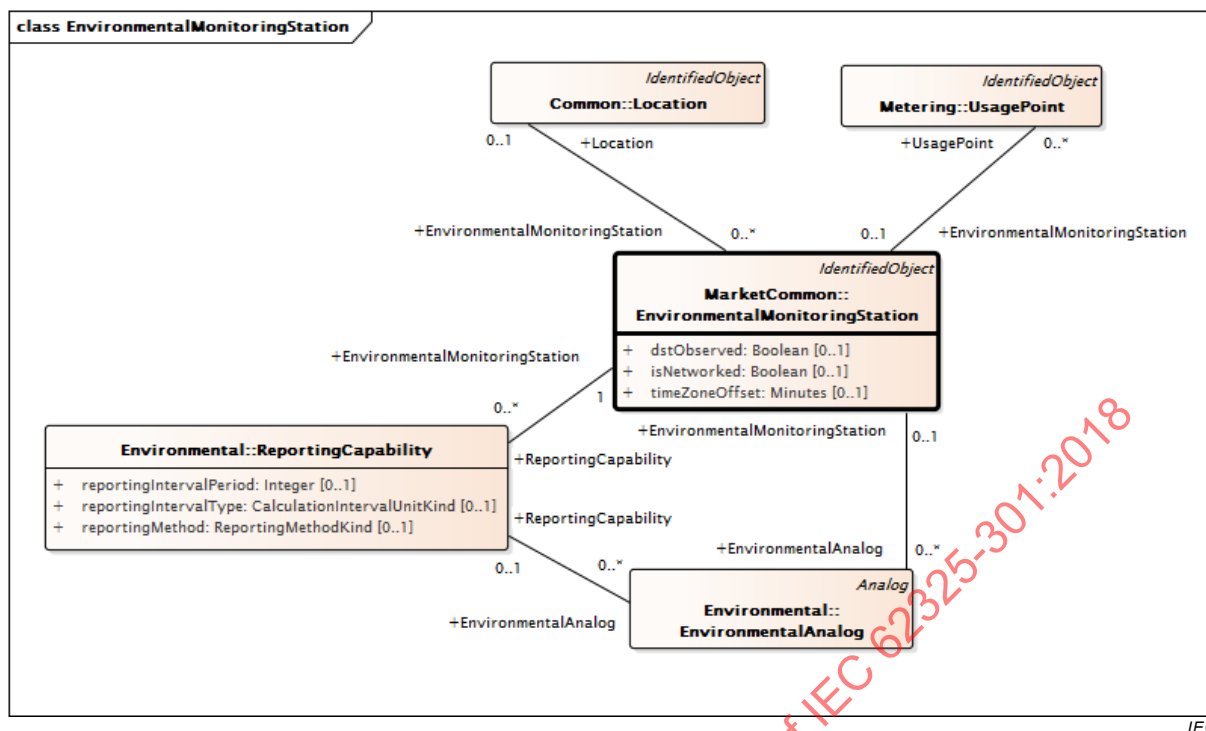
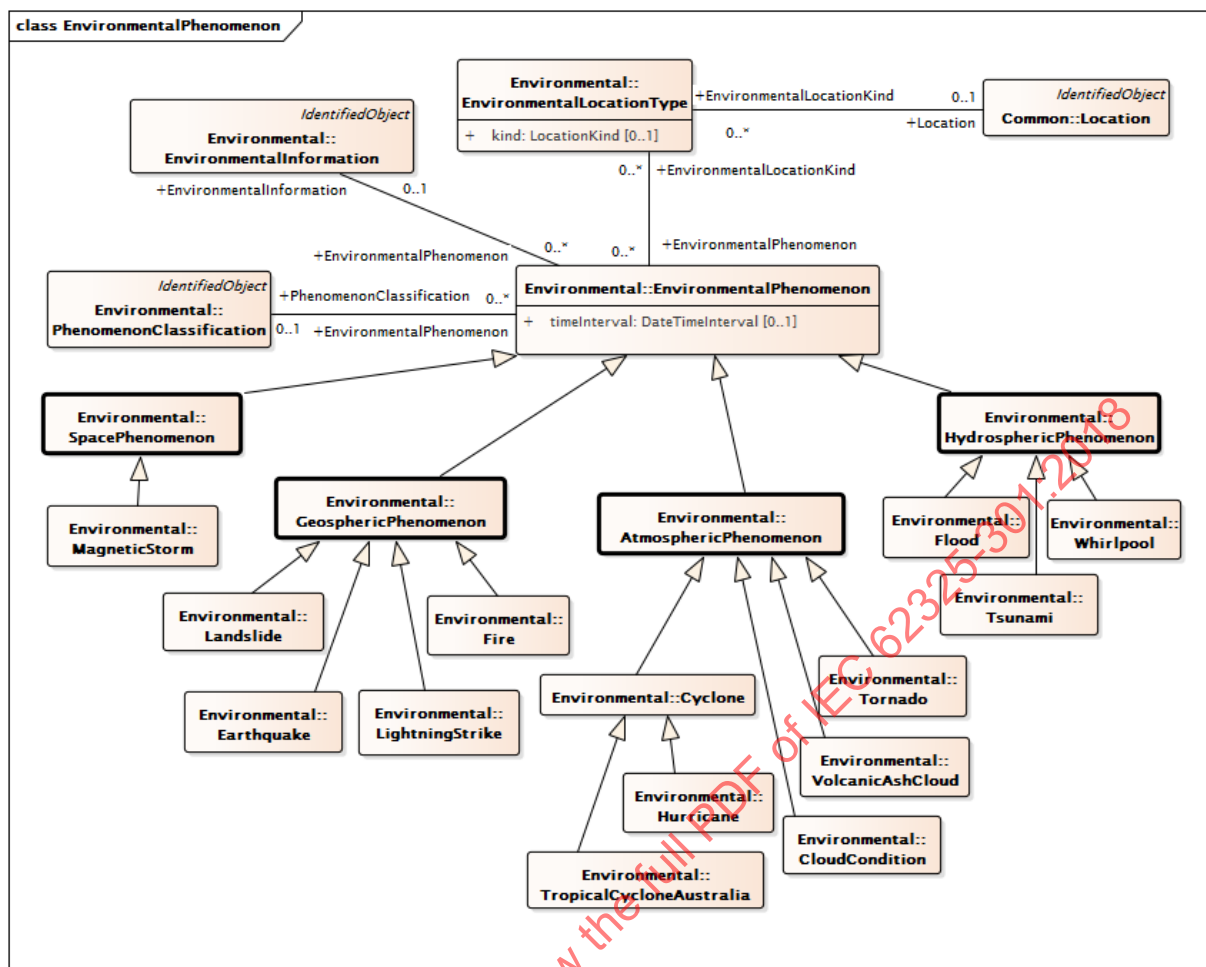


Figure 22 – Environmental monitoring station

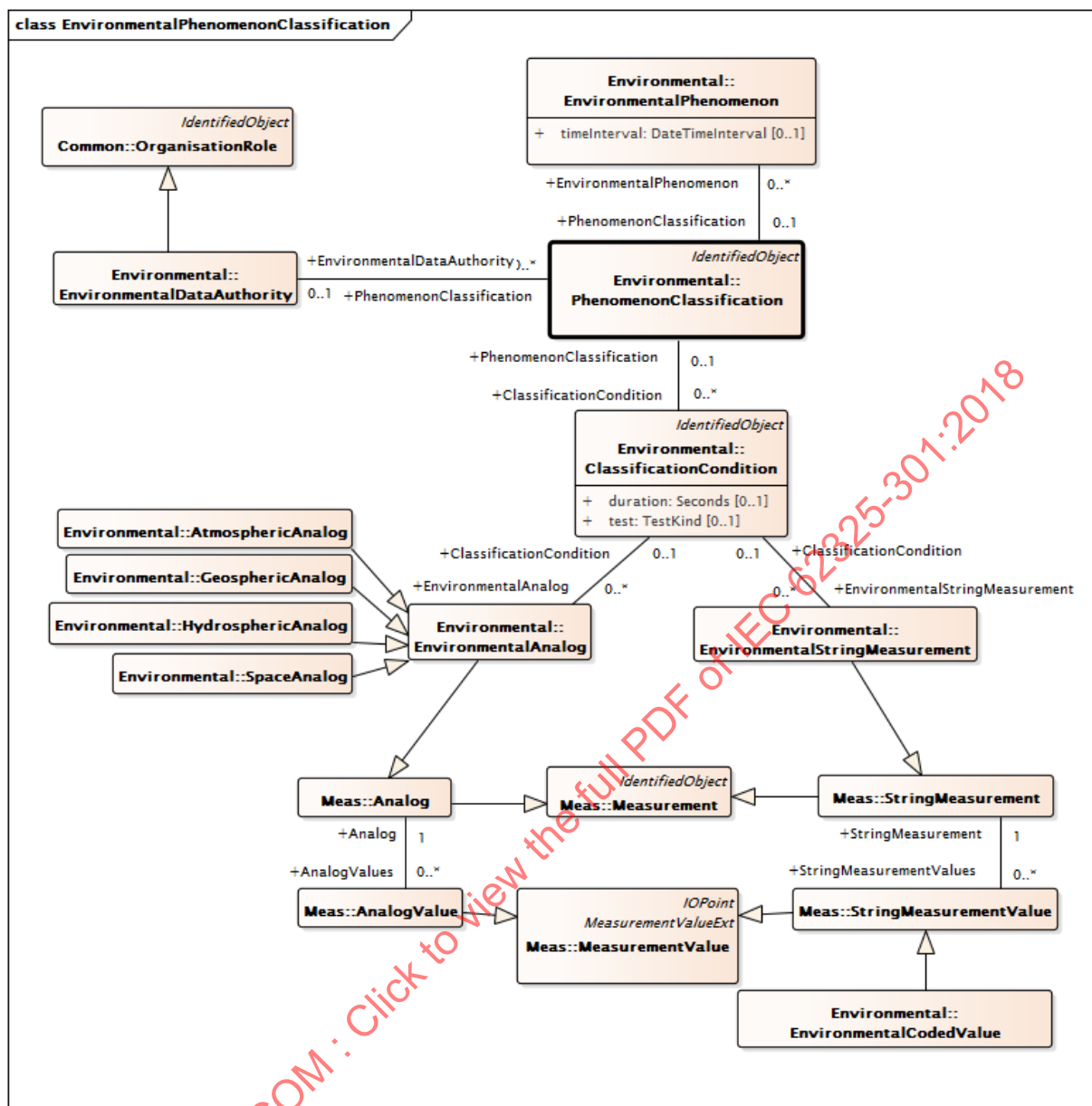
Figure 23 overviews the modeling of environmental phenomena. The characteristics of environment phenomena (i.e., hurricanes, tornados, grass fires, floods, geo-magnetic space storms) at a moment in time are described by the 'EnvironmentalPhenomenon' class and its children, which are subclassed using the same regional groupings used for analogs (atmospheric, geospheric, hydrospheric, and space). The location of phenomena are often described by both a center and extent, and this is supported by means of the 'EnvironmentalLocationKind' class.



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Figure 23 – Environmental Phenomenon

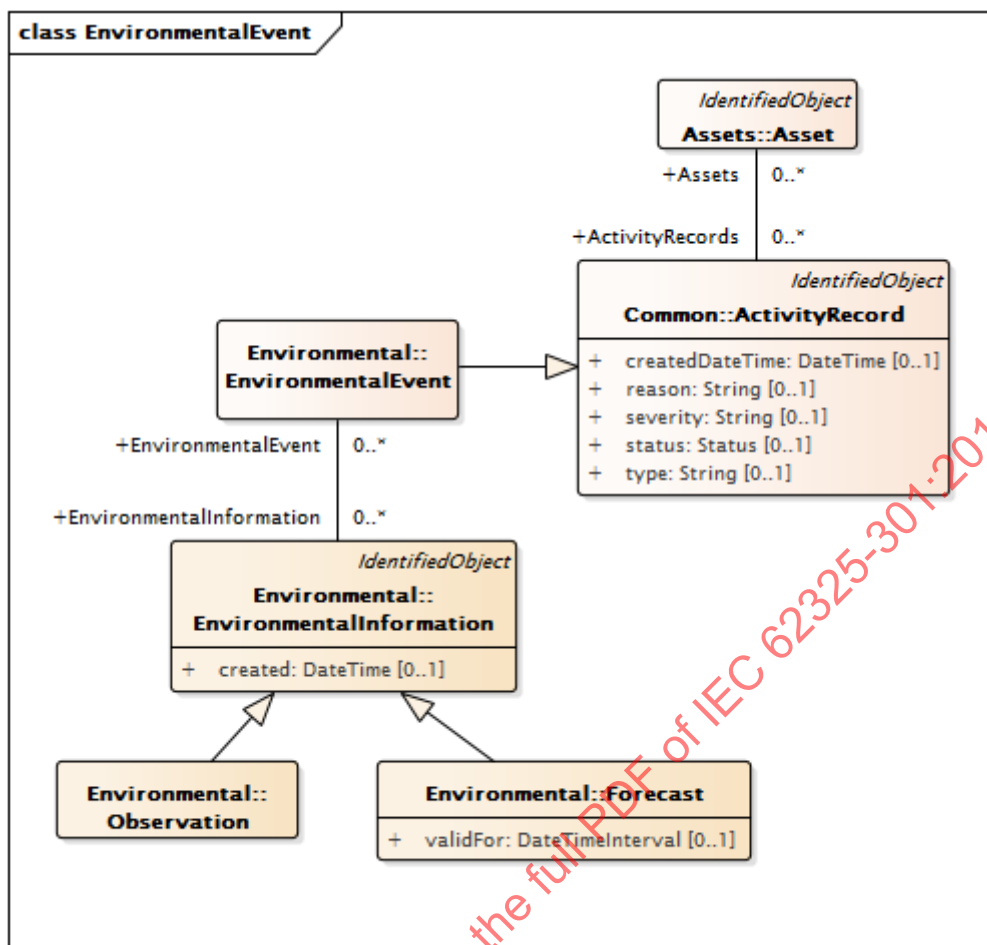
Additional definition of the severity of phenomena can be accomplished by using the 'PhenomenonClassification' class and associated classes, which allow an environmental data authority (for example a weather service or utility) to define threshold levels of measurement values associated with phenomenon classification conditions. These are shown in Figure 24.



IEC

Figure 24 – Environmental Phenomenon classification

Figure 25 illustrates the modeling of environmental events. Major events, like hurricane Katrina or the 2008 Sichuan earthquake, are represented by the EnvironmentalEvent class and can be described through time by means of multiple forecasts and/or observations ('EnvironmentalInformation' child class instances) each related to the environmental event and each including one or more phenomenon 'snapshots' ('EnvironmentalPhenomenon' child class instances).



IEC

Figure 25 – Environmental Event

Environmental alerts are illustrated in Figure 26. Environmental alerts, like tornado watches and warnings, are described by the ‘EnvironmentalAlert’ class, which supports the definition of alert provider, alerting authority, and alert location. Alerting authorities (like the US National Weather Service) periodically update the types and definitions of alerts they can issue and the ‘AlertTypeList’ class allows the specification of which version of alert definitions is being used. Some alerts have primary and secondary locations to which they apply and the ‘EnvironmentalLocationKind’ class allows this distinction to be made.

In addition to supporting the identification of major, named environmental events (like fires or tsunamis), the ‘EnvironmentalEvent’ class also supports the definition of smaller, local environmental events (like localized flooding) and allows them to be related to assets.

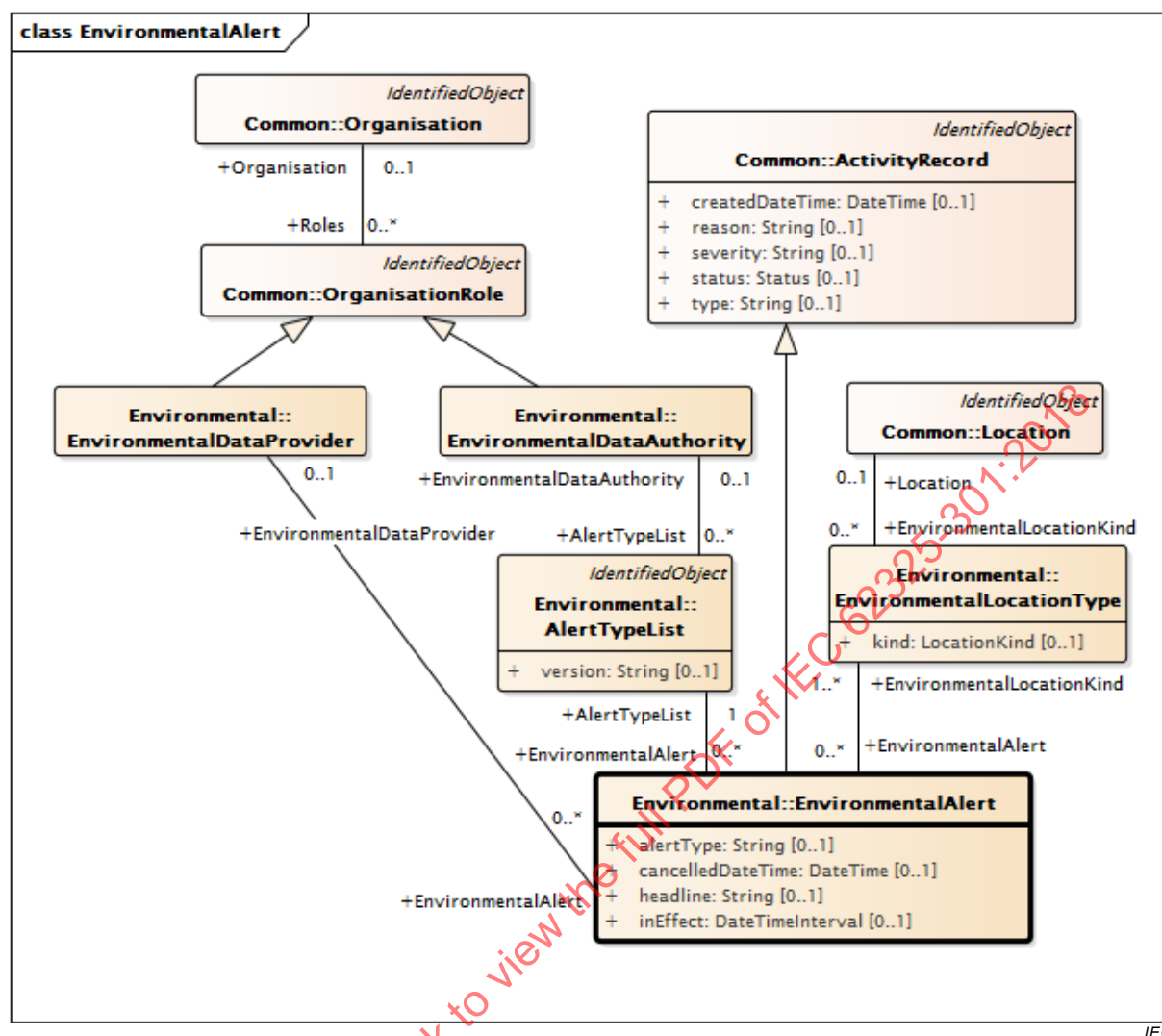


Figure 26 – Environmental alert

4.5 Modeling guidelines

4.5.1 Modeling for change

IEC 62325-301 defines the CIM along with IEC 61970-301, IEC 61970-302 and IEC 61968-11.

4.5.2 Process for amendments to the CIM

It may be desirable to amend the CIM to either revise the existing model or to extend the CIM to model additional elements of an electric utility power system. The recommended process for such amendments is as follows.

- Prepare a use case(s) to describe the desired changes. This should include proposed changes to the appropriate class diagrams showing new/revised classes, attributes, and associations.
- The use case(s) is then reviewed by the appropriate working group to decide if the requested changes should be treated as revisions to the current CIM standard, or if they should be treated as private amendments, not requiring a change to the standard itself.
- Proposed amendments accepted by the working group will be added to a list of outstanding issues, and at the appropriate time, a new version of the CIM model will be prepared and an update made to the appropriate IEC CIM specification.

4.5.3 Changes to the CIM UML model

From a modeling perspective, when the CIM is extended, the approach is to start with the existing CIM UML model. The extensions may be added in any of several ways that are available in UML, but in all cases the approach is to inspect the current model and determine the best way to build off of the existing class diagrams. The extensions may take the form of any of the following, starting from the simplest to the most complex:

- adding additional attributes to existing classes;
- adding additional associations between two existing classes;
- adding new classes that are specializations of existing classes;
- adding new classes via associations with existing classes.

The main objective is to reuse the existing CIM to the maximum extent possible. From a packaging point of view, extensions should be made to existing packages where possible. If the extensions comprise a new domain of application, then consideration should be given to creating a new package for the additions, but still creating the necessary associations to the existing package, keeping in mind that even though a new package is being created, the CIM is still a single model.

4.5.4 Changes to the CIM standards documents

From a documentation perspective, when the CIM is extended, a decision shall be made whether the changes constitute updates to existing CIM standards documents, or whether a new part 3xx specification is required.

4.5.5 CIM profiles

An implementation of the CIM need not include all classes, attributes, or associations in the standard CIM specification to be compliant with the CIM standard. Profiles may be defined to specify which elements shall be included (i.e., mandatory elements) in a particular use of the CIM, as well as which are optional. The CIM for Market profiles are defined in the Part IEC 62325-35X and -45X series and shall be based on the modeling rules defined in IEC 62325-450.

In IEC 62325-450, the definition of CIM profiles follows a layered modeling framework to go from the CIM information model down to the specification of messages based on CIM concepts through the definition of different regional contextual models and their subsequent contextualized documents for information exchange.

A full discussion of the rules for IEC 62325 series profiles is presented in IEC 62325-450. Please refer to IEC 62325-450 for a complete explanation and a full description of these rules.

4.6 Modeling tools

The entire CIM UML model exists as an Enterprise Architect project file and is viewable with that tool, including the class diagrams and descriptions of classes, attributes, types, and relationships. Viewing the CIM in this fashion provides a graphical navigation interface that permits all CIM specification data to be viewed via point-and-click from the class diagram in each package. A free viewer is available through Sparx Systems.

Ideally, the CIM information model is independent of any specific UML tool, though experience has shown that exchanges between different tools are often less than perfect. Until tool interoperability is proven effective, future changes to the CIM specification, resulting in new versions of this standard, will be incorporated first into the Enterprise Architect project description to ensure a single source for the CIM model data.

5 Detailed model

5.1 Overview

The common information model (CIM) represents a comprehensive logical view of market operations system information. This definition includes the public classes and attributes, as well as the relationships between them. Subclause 5.2 describes how Clause 6 is structured. Clause 6 is automatically generated from the CIM model.

5.2 Context

The CIM is partitioned into subpackages. Classes within the packages are listed alphabetically. Native class attributes are listed first, followed by inherited attributes in order of depth of inheritance, then by attribute name. Native associations are listed first for each class, followed by inherited associations in order of depth of inheritance, then alphabetically by class name, then alphabetically by association end name. The associations are described according to the role of each class participating in the association. The association ends are listed under the class at each end of an association.

For each package, the model information for each class is fully described in attribute and association end tables. Attribute and association end information for native and inherited attributes is listed as shown in Table 1 and Table 2. For any inherited attributes or association ends the “description” column will contain text indicating the attributes is inherited from a specific class. The description column for native attributes and association ends contains the actual description.

Table 1 – Attribute documentation

name	type	description
native1	Float	A floating point native attribute of the class is described here.
native2	ActivePower	Documentation for another native attribute of type ActivePower.
Name	Float	Inherited from class IdentifiedObject

As shown in Table 1, in an attribute table, in some cases, an attribute is a constant, in which case the phrase “(const)” is added in the name column of the attribute table. In such cases, the attribute normally has an initial value also which is preceded by an equal sign and appended to the attribute name.

Table 2 – Association ends documentation

[mult from]	[mult to] name	type	description
[0..*]	[0..1] PSRType	PSRType	PSRType (custom classification) for this PowerSystemResource.
[0..1]	[0..*] Measurements	Measurement	The Measurements that are included in the naming hierarchy where the PSR is the containing object
[1..1]	[0..*] OperatingShare	OperatingShare	The linkage to any number of operating share objects.
[0..*]	[0..*] PsrLists	PsrList	
[1..1]	[0..1] OutageSchedule	OutageSchedule	A power system resource may have an outage schedule
[0..*]	[0..*] ReportingGroup	ReportingGroup	Reporting groups to which this PSR belongs.
[0..1]	[0..*] DiagramObjects	DiagramObject	inherited from: IdentifiedObject
[1..1]	[0..*] Names	Name	inherited from: IdentifiedObject

As shown in Table 2, in an association ends table, the first column describes the multiplicity at the other end of the association (i.e., the multiplicity of the class for which association ends are being described). The multiplicity of the association end itself is included in brackets. The association end name is listed in plain text. The class at the other end of the association is listed in the “type” column. A multiplicity of zero indicates an optional association. A multiplicity of “*” indicates any number is allowed. For example, a multiplicity of [1..*] indicates a range from 1 to any larger number is allowed.

In the case that a class is an enumeration, the attributes table is replaced by the enums table as shown in Table 3, since enumeration literals have no type. There are no inherited enumeration literals for an enumeration class.

Table 3 – Enums documentation

literal	description
native1	This is the first native enumeration value.
native2	This is the second native enumeration value.
native3	There are typically no inherited attributes for enumerations.

6 Top package IEC62325

6.1 General

The IEC 62325 subpackages of the CIM are developed, standardized and maintained by the IEC.

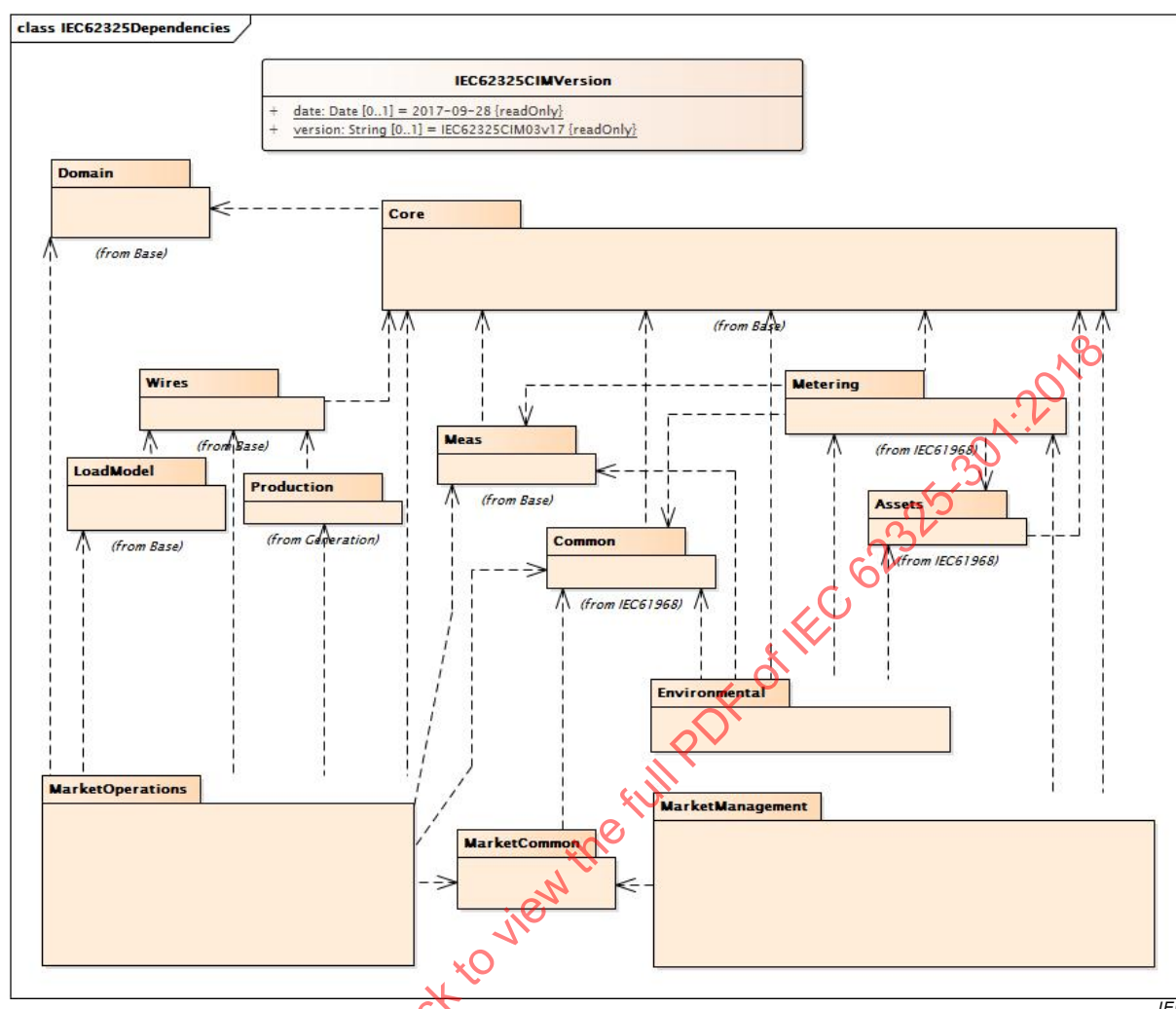


Figure 27 – Class diagram IEC62325::IEC62325Dependencies

Figure 27: Shows the version and top level IEC 62325 packages and their logical dependencies among packages based on inheritance only. Packages with references to an IEC standard are documented in other IEC standard specifications. Packages without references are documented in clause 6.

6.2 IEC62325CIMVersion root class

IEC 62325 version number assigned to this UML model.

Table 4 shows all attributes of IEC62325CIMVersion.

Table 4 – Attributes of IEC62325::IEC62325CIMVersion

name	mult	type	description
date	0..1	Date	(const=2017-09-28) Form is YYYY-MM-DD for example for January 5, 2009 it is 2009-01-05.
version	0..1	String	(const=IEC62325CIM03v17) Form is IEC62325CIMXXvYY where XX is the major CIM package version and the YY is the minor version. For example IEC62325CIM10v03.

6.3 Package MarketCommon

6.3.1 General

This package contains the common objects shared by MarketManagement, MarketOperations and Environmental packages.

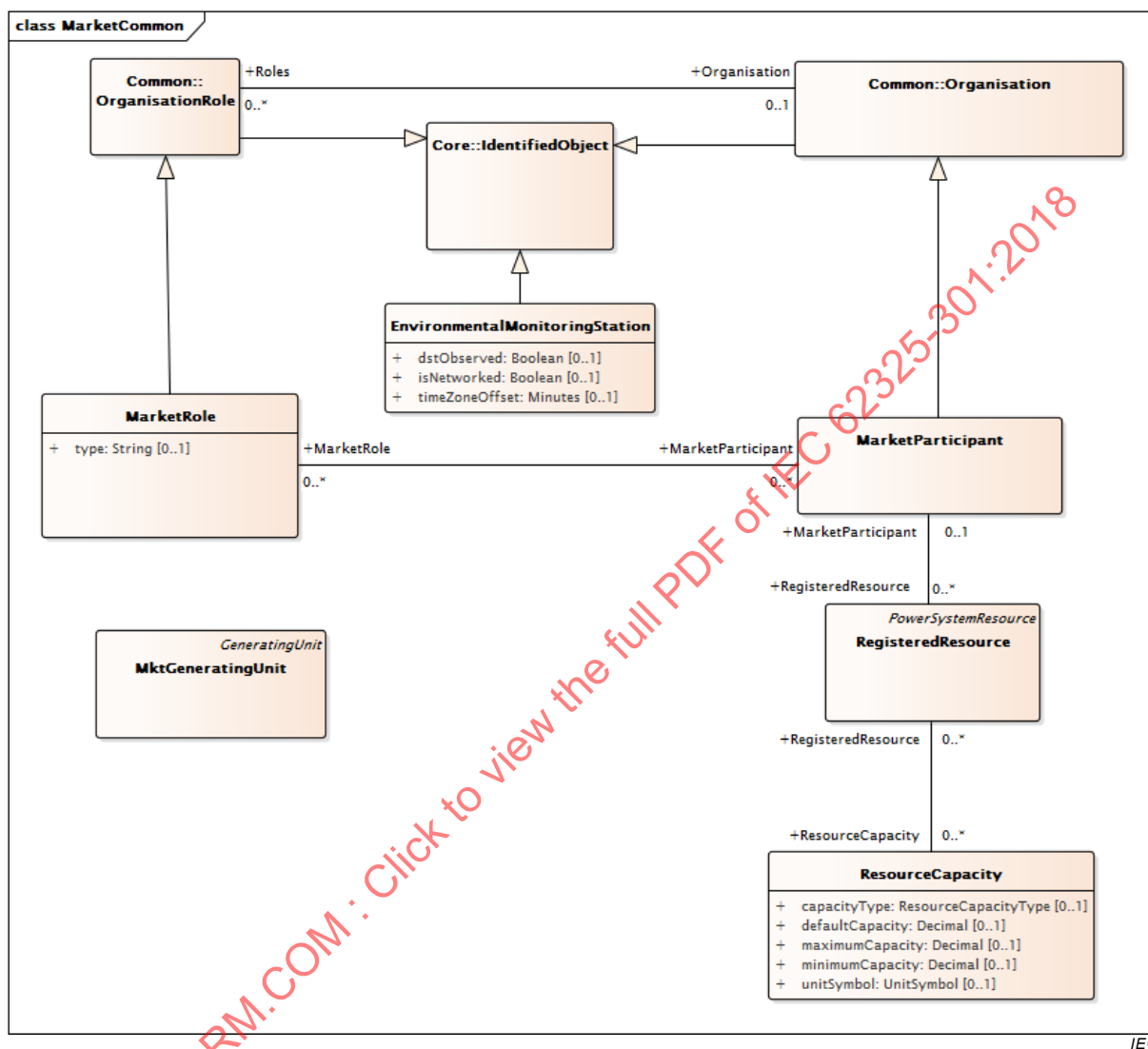


Figure 28 – Class diagram MarketCommon::MarketCommon

Figure 28: Shows common classes used by MarketManagement, MarketOperations and Environmental packages.

6.3.2 MarketParticipant

An identification of a party acting in a electricity market business process. This class is used to identify organizations that can participate in market management and/or market operations.

Table 5 shows all attributes of MarketParticipant.

Table 5 – Attributes of MarketCommon::MarketParticipant

name	mult	type	description
streetAddress	0..1	StreetAddress	inherited from: Organisation
postalAddress	0..1	StreetAddress	inherited from: Organisation
phone1	0..1	TelephoneNumber	inherited from: Organisation
phone2	0..1	TelephoneNumber	inherited from: Organisation
electronicAddress	0..1	ElectronicAddress	inherited from: Organisation
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 6 shows all association ends of MarketParticipant with other classes.

Table 6 – Association ends of MarketCommon::MarketParticipant with other classes

mult from	name	mult to	type	description
0..*	MarketPerson	0..*	MarketPerson	
0..*	MarketDocument	0..*	MarketDocument	
0..1	SchedulingCoordinator	0..*	SchedulingCoordinator	
0..1	RegisteredResource	0..*	RegisteredResource	
0..1	Bid	0..*	Bid	
0..*	TimeSeries	0..*	TimeSeries	
0..*	MarketRole	0..*	MarketRole	
0..*	ParentOrganisation	0..1	ParentOrganization	inherited from: Organisation
0..1	Roles	0..*	OrganisationRole	inherited from: Organisation
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.3.3 MarketRole

The external intended behavior played by a party within the electricity market.

Table 7 shows all attributes of MarketRole.

Table 7 – Attributes of MarketCommon::MarketRole

name	mult	type	description
type	0..1	String	The kind of market roles that can be played by parties for given domains within the electricity market. Types are flexible using dataType of string for free-entry of role types.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 8 shows all association ends of MarketRole with other classes.

Table 8 – Association ends of MarketCommon::MarketRole with other classes

mult from	name	mult to	type	description
0..*	MarketParticipant	0..*	MarketParticipant	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: OrganisationRole
0..*	Organisation	0..1	Organisation	inherited from: OrganisationRole
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.3.4 RegisteredResource

A resource that is registered through the market participant registration system. Examples include generating unit, load, and non-physical generator or load.

Table 9 shows all attributes of RegisteredResource.

Table 9 – Attributes of MarketCommon::RegisteredResource

name	mult	type	description
ACAFlag	0..1	YesNo	Indication that this resource is associated with an Adjacent Control Area.
ASSPOptimizationFlag	0..1	YesNo	Indication that the resource participates in the optimization process by default.
commercialOpDate	0..1	DateTime	Resource Commercial Operation Date.
contingencyAvailFlag	0..1	YesNo	Contingent operating reserve availability (Yes/No). Resource is available to participate with capacity in contingency dispatch.
dispatchable	0..1	Boolean	Dispatchable: indicates whether the resource is dispatchable. This implies that the resource intends to submit Energy bids/offers or Ancillary Services bids/offers, or self-provided schedules.
ECAFlag	0..1	YesNo	Indication that this resource is associated with an Embedded Control area.
flexibleOfferFlag	0..1	YesNo	Flexible offer flag (Y/N).
hourlyPredispatch	0..1	YesNo	Indicates need to dispatch before the start of the operating hour. Only relevant in Real-Time

name	mult	type	description
			Market. Applies to generation, inertia and participating load resource. Value (Y/N).
isAggregatedRes	0..1	YesNo	A flag to indicate if a resource is an aggregated resource.
lastModified	0..1	DateTime	Indication of the last time this item was modified/versioned.
LMPMFlag	0..1	YesNo	LMPM flag: indicates whether the resource is subject to the LMPM test (Yes/No).
marketParticipationFlag	0..1	YesNo	Market Participation flag: indicates whether the resource participate in the market.
maxBaseSelfSchedQty	0..1	Float	Maximum base self schedule quantity.
maxOnTime	0..1	Float	Maximum on time after start up.
minDispatchTime	0..1	Hours	Minimum number of consecutive hours a resource shall be dispatched if bid is accepted.
minOffTime	0..1	Float	Minimum off time after shut down.
minOnTime	0..1	Float	Minimum on time after start up.
mustOfferFlag	0..1	YesNo	Must offer flag: indicates whether the unit is subject to the must offer provisions (Y/N).
nonMarket	0..1	YesNo	Flag to indicate that the Resource is not participating in the Market Operations.
pointOfDeliveryFlag	0..1	YesNo	Indication that the registered resource is a Point of Delivery (YES) resource which implies there is a POD Loss Factor.
priceSetFlagDA	0..1	YesNo	Price setting flag: indicates whether a resource is capable of setting the Market Clearing Price (Y) for the DA market, and if not, indicates whether the resource shall submit bids for energy at \$ 0 (S) or not (N). Initially in the RegisteredGenerator class. It was moved to the RegisteredResource class for the participating load dispatch purpose.
priceSetFlagRT	0..1	YesNo	Price setting flag: indicates whether a resource is capable of setting the Market Clearing Price (Y) for the RT market, and if not, indicates whether the resource shall submit bids for energy at \$ 0 (S) or not (N). Initially in the RegisteredGenerator class. It was moved to the RegisteredResource class for the participating load dispatch purpose.
registrationStatus	0..1	ResourceRegistrationStatus	Registration Status of resource – Active, Mothballed, Planned, or Decommissioned.
resourceAdequacyFlag	0..1	YesNo	Indication that this resource participates in the resource adequacy function.
SMPMFlag	0..1	YesNo	SMPM flag: indicates whether the resource is subject to the SMPM test (Yes/No).
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 10 shows all association ends of RegisteredResource with other classes.

Table 10 – Association ends of MarketCommon::RegisteredResource with other classes

mult from	name	mult to	type	description
0..*	MarketParticipant	0..1	MarketParticipant	
0..*	ForbiddenRegion	0..*	ForbiddenRegion	
0..*	AggregateNode	0..1	AggregateNode	An AggregateNode may be associated with up to many RegisteredResources.
1..1	DispatchInstReply	0..*	DispatchInstReply	
0..*	TimeSeries	0..*	TimeSeries	
0..*	RampRateCurve	0..*	RampRateCurve	
0..1	ContractDistributionFactor	0..*	ContractDistributionFactor	
1..1	OrgResOwnership	0..*	OrgResOwnership	
0..1	RMROperatorInput	0..*	RMROperatorInput	
0..1	ResourceDispatchResults	0..*	ResourceDispatchResults	
0..1	SubstitutionResourceList	0..*	SubstitutionResourceList	
0..*	AdjacentCaset	0..1	AdjacentCaset	
0..*	SubControlArea	0..*	SubControlArea	
1..1	IntermittentResourceEligibility	0..*	IntermittentResourceEligibility	
1..1	FormerReference	0..*	FormerReference	
1..1	Commitments	0..*	Commitments	
0..1	MPMResourceStatus	0..*	MPMResourceStatus	
0..1	RUCAwardInstruction	0..*	RUCAwardInstruction	
0..1	AllocationResultValues	0..*	AllocationResultValues	
1..1	LoadFollowingInst	0..*	LoadFollowingInst	
0..1	ResourceLoadFollowingInst	0..*	ResourceLoadFollowingInst	
1..1	ResourceAncillaryServiceQualification	0..*	ResourceCertification	RegisteredResources are qualified for resource ancillary service types (which include market product types as well as other types such as BlackStart) by the association to the class ResourceAncillaryServiceQualification.
0..1	ExpectedEnergyValues	0..*	ExpectedEnergyValues	
0..*	Reason	0..*	Reason	
0..*	InterTie	0..*	SchedulingPoint	
0..*	MktConnectivityNode	0..1	MktConnectivityNode	
0..1	DopInstruction	0..*	DopInstruction	
0..*	ResourceCapacity	0..*	ResourceCapacity	
1..1	ResourceVerifiableCosts	0..1	ResourceVerifiableCosts	
1..1	DefaultBid	0..1	DefaultBid	
0..*	MarketObjectStatus	0..*	MarketObjectStatus	
0..*	ControlAreaDesignation	0..*	ControlAreaDesignation	
0..1	LoadFollowingOperatorInput	0..*	LoadFollowingOperatorInput	
0..*	MPMTestThreshold	0..*	MPMTestThreshold	
0..1	ResourceAwardInstructi	0..*	ResourceAwardInstructi	

mult from	name	mult to	type	description
	on		on	
0..1	ExPostResourceResults	0..*	ExPostResourceResults	
1..1	Instructions	0..*	Instructions	
0..*	Pnode	0..1	Pnode	A registered resource injects power at one or more connectivity nodes related to a pnode
0..*	HostControlArea	0..1	HostControlArea	
0..*	Domain	0..*	Domain	
0..*	EnergyMarkets	0..*	EnergyMarket	
0..1	DotInstruction	0..*	DotInstruction	
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.3.5 MktGeneratingUnit

Subclass of IEC61970:Production:GeneratingUnit.

Table 11 shows all attributes of MktGeneratingUnit.

Table 11 – Attributes of MarketCommon::MktGeneratingUnit

name	mult	type	description
allocSpinResP	0..1	ActivePower	inherited from: GeneratingUnit
autoCntrlMarginP	0..1	ActivePower	inherited from: GeneratingUnit
baseP	0..1	ActivePower	inherited from: GeneratingUnit
controlDeadband	0..1	ActivePower	inherited from: GeneratingUnit
controlPulseHigh	0..1	Seconds	inherited from: GeneratingUnit
controlPulseLow	0..1	Seconds	inherited from: GeneratingUnit
controlResponseRate	0..1	ActivePowerChangeRate	inherited from: GeneratingUnit
efficiency	0..1	PerCent	inherited from: GeneratingUnit
genControlMode	0..1	GeneratorControlMode	inherited from: GeneratingUnit
genControlSource	0..1	GeneratorControlSource	inherited from: GeneratingUnit
governorMPL	0..1	PU	inherited from: GeneratingUnit
governorSCD	0..1	PerCent	inherited from: GeneratingUnit
highControlLimit	0..1	ActivePower	inherited from: GeneratingUnit
initialP	0..1	ActivePower	inherited from: GeneratingUnit
longPF	0..1	Float	inherited from: GeneratingUnit
lowControlLimit	0..1	ActivePower	inherited from: GeneratingUnit

name	mult	type	description
lowerRampRate	0..1	ActivePowerChangeRate	inherited from: GeneratingUnit
maxEconomicP	0..1	ActivePower	inherited from: GeneratingUnit
maximumAllowableSpinningReserve	0..1	ActivePower	inherited from: GeneratingUnit
maxOperatingP	0..1	ActivePower	inherited from: GeneratingUnit
minEconomicP	0..1	ActivePower	inherited from: GeneratingUnit
minimumOffTime	0..1	Seconds	inherited from: GeneratingUnit
minOperatingP	0..1	ActivePower	inherited from: GeneratingUnit
modelDetail	0..1	Classification	inherited from: GeneratingUnit
nominalP	0..1	ActivePower	inherited from: GeneratingUnit
normalPF	0..1	Float	inherited from: GeneratingUnit
penaltyFactor	0..1	Float	inherited from: GeneratingUnit
raiseRampRate	0..1	ActivePowerChangeRate	inherited from: GeneratingUnit
ratedGrossMaxP	0..1	ActivePower	inherited from: GeneratingUnit
ratedGrossMinP	0..1	ActivePower	inherited from: GeneratingUnit
ratedNetMaxP	0..1	ActivePower	inherited from: GeneratingUnit
shortPF	0..1	Float	inherited from: GeneratingUnit
startupCost	0..1	Money	inherited from: GeneratingUnit
startupTime	0..1	Seconds	inherited from: GeneratingUnit
tieLinePF	0..1	Float	inherited from: GeneratingUnit
totalEfficiency	0..1	PerCent	inherited from: GeneratingUnit
variableCost	0..1	Money	inherited from: GeneratingUnit
aggregate	0..1	Boolean	inherited from: Equipment
inService	0..1	Boolean	inherited from: Equipment
networkAnalysisEnabled	0..1	Boolean	inherited from: Equipment
normallyInService	0..1	Boolean	inherited from: Equipment
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 12 shows all association ends of MktGeneratingUnit with other classes.

Table 12 – Association ends of MarketCommon::MktGeneratingUnit with other classes

mult from	name	mult to	type	description
1..1	GeneratingUnitDynamicValues	0..*	GeneratingUnitDynamicValues	
0..1	RotatingMachine	0..*	RotatingMachine	inherited from: GeneratingUnit
1..1	GenUnitOpCostCurves	0..*	GenUnitOpCostCurve	inherited from: GeneratingUnit
1..1	GenUnitOpSchedule	0..1	GenUnitOpSchedule	inherited from: GeneratingUnit
1..1	ControlAreaGeneratingUnit	0..*	ControlAreaGeneratingUnit	inherited from: GeneratingUnit
1..1	GrossToNetActivePowerCurves	0..*	GrossToNetActivePowerCurve	inherited from: GeneratingUnit

mult from	name	mult to	type	description
0..1	OperationalLimitSet	0..*	OperationalLimitSet	inherited from: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	inherited from: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	inherited from: Equipment
0..1	Faults	0..*	Fault	inherited from: Equipment
0..*	AdditionalEquipmentContainer	0..*	EquipmentContainer	inherited from: Equipment
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.3.6 EnvironmentalMonitoringStation

An environmental monitoring station, examples of which could be a weather station or a seismic monitoring station.

Table 13 shows all attributes of EnvironmentalMonitoringStation.

Table 13 – Attributes of MarketCommon::EnvironmentalMonitoringStation

name	mult	type	description
dstObserved	0..1	Boolean	Whether this station is currently reporting using daylight saving time. Intended to aid a utility Weather Service in interpreting information coming from a station and has no direct relationship to the manner in which time is expressed in EnvironmentalValueSet.
isNetworked	0..1	Boolean	Indication that station is part of a network of stations used to monitor weather phenomena covering a large geographical area.
timeZoneOffset	0..1	Minutes	The time offset from UTC (a.k.a. GMT) configured in the station "clock", not (necessarily) the time zone in which the station is physically located. This attribute exists to support management of utility monitoring stations and has no direct relationship to the manner in which time is expressed in EnvironmentalValueSet.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 14 shows all association ends of EnvironmentalMonitoringStation with other classes.

Table 14 – Association ends of MarketCommon::EnvironmentalMonitoringStation with other classes

mult from	name	mult to	type	description
0..*	Location	0..1	Location	Location of this monitoring station.
0..1	UsagePoint	0..*	UsagePoint	
0..1	EnvironmentalAnalog	0..*	EnvironmentalAnalog	Environmental analog measurement provided by this monitoring station.
0..*	TimeSeries	0..*	TimeSeries	
1..1	ReportingCapability	0..*	ReportingCapability	One of the reporting capabilities of this monitoring station.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.3.7 ResourceCapacity root class

This class model the various capacities of a resource. A resource may have numbers of capacities related to operating, ancillary services, energy trade and so forth. Capacities may be defined for active power or reactive power.

Table 15 shows all attributes of ResourceCapacity.

Table 15 – Attributes of MarketCommon::ResourceCapacity

name	mult	type	description
capacityType	0..1	ResourceCapacityType	capacity type The types are but not limited to: Regulation Up Regulation Dn Spinning Reserve Non-Spinning Reserve FOO capacity MOO capacity
defaultCapacity	0..1	Decimal	default capacity
maximumCapacity	0..1	Decimal	maximum capacity
minimumCapacity	0..1	Decimal	minimum capacity
unitSymbol	0..1	UnitSymbol	Unit selection for the capacity values.

Table 16 shows all association ends of ResourceCapacity with other classes.

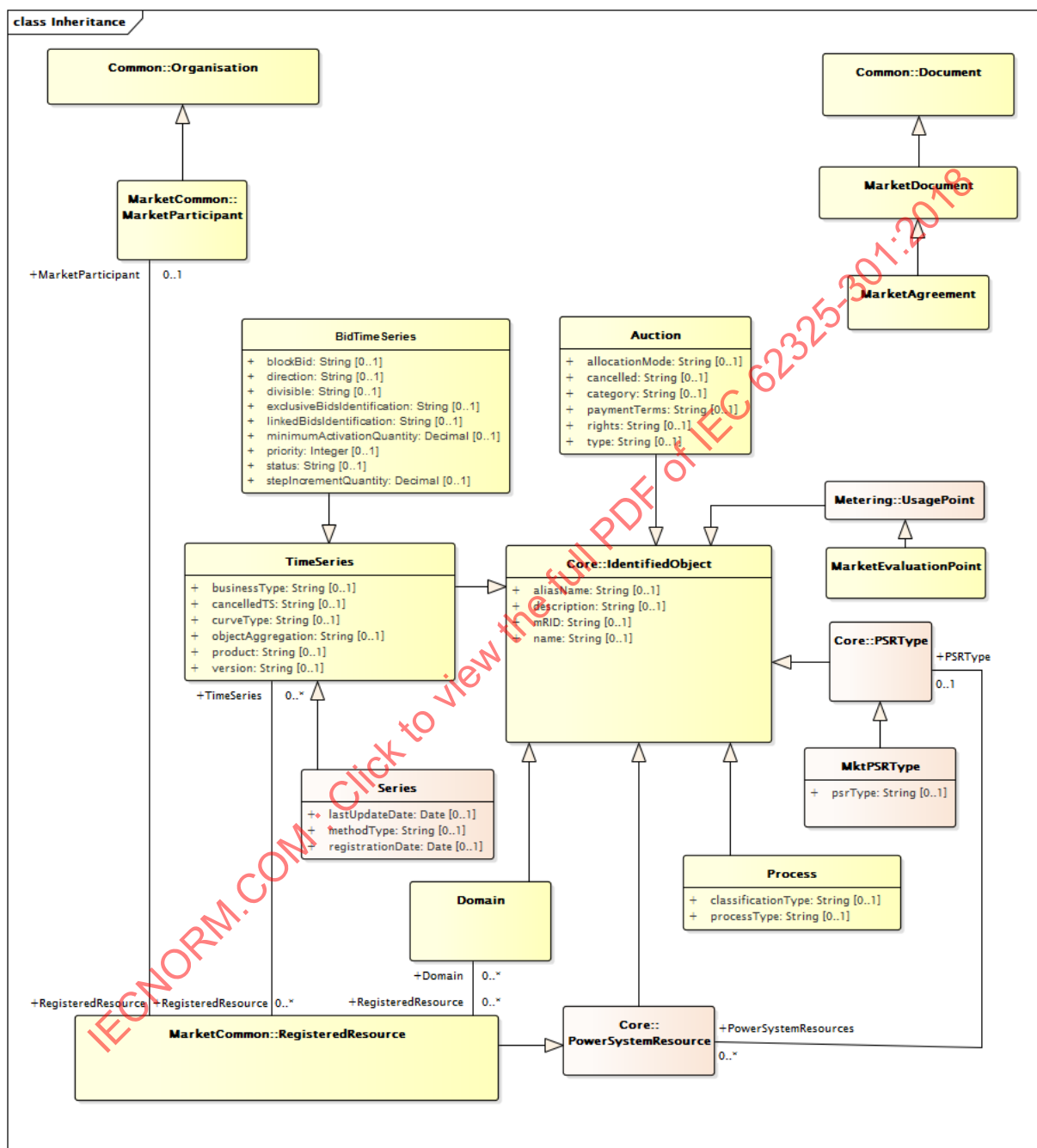
Table 16 – Association ends of MarketCommon::ResourceCapacity with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..*	RegisteredResource	

6.4 Package MarketManagement

6.4.1 General

This package contains all core CIM Market Extensions required for market management systems.



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Figure 29 – Class diagram MarketManagement::Inheritance

Figure 29: Provides the Market Management Inheritance structure.

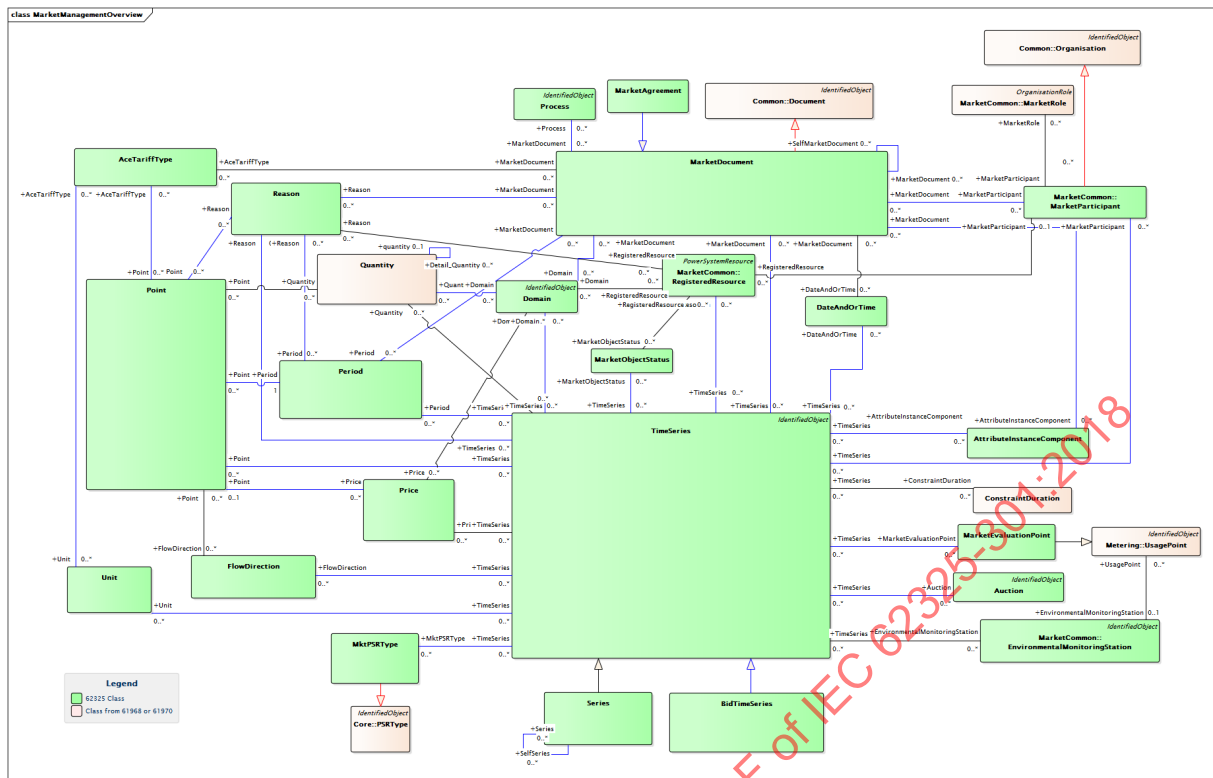


Figure 30 – Class diagram MarketManagement::MarketManagementOverview

Figure 30: Describes all used classes for the definition of Market Management Profiles.

It is possible to see all dependencies with other common CIM concepts in Energy Management Systems and Distribution Management Systems.

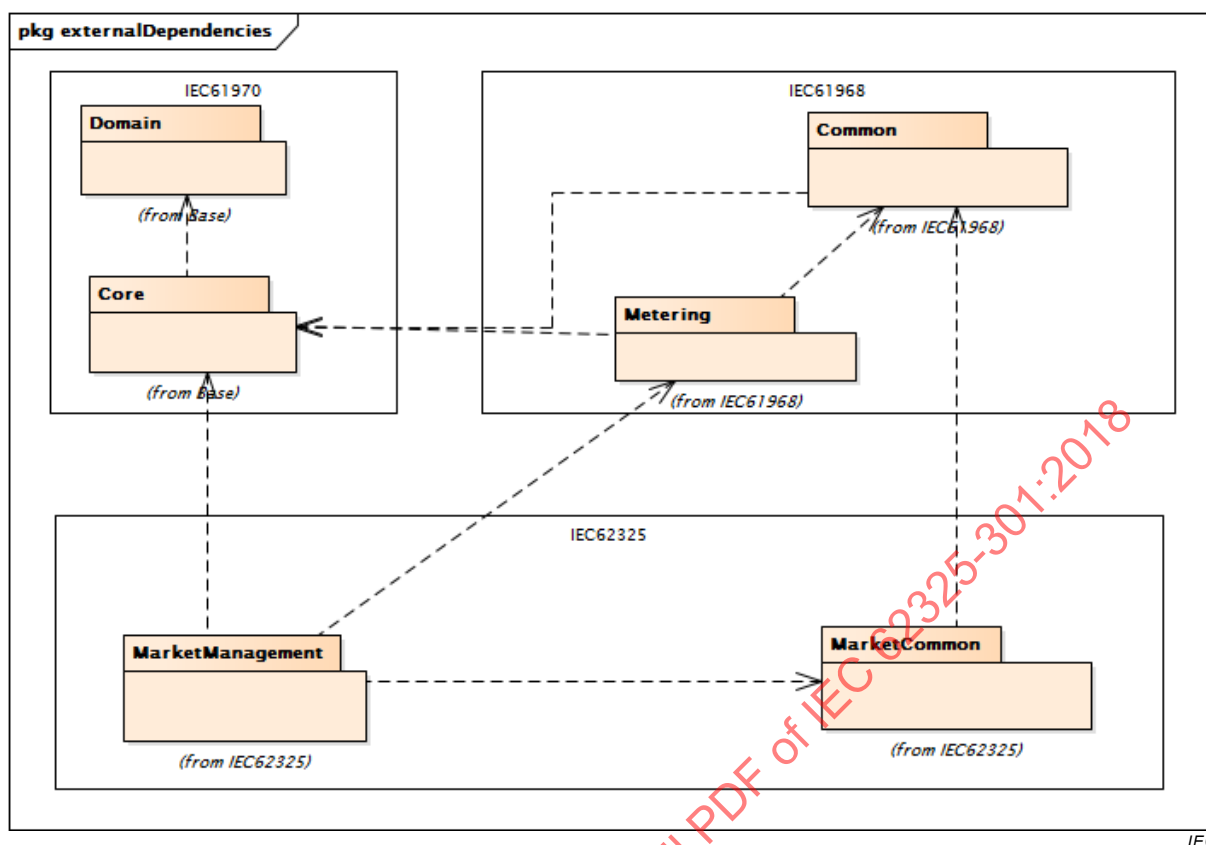


Figure 31 – Package diagram MarketManagement::externalDependencies

Figure 31: Provides the Market Management external dependencies.

6.4.2 AceTariffType root class

The Area Control Error tariff type that is applied or used.

Table 17 shows all attributes of AceTariffType.

Table 17 – Attributes of MarketManagement::AceTariffType

name	mult	type	description
type	0..1	String	The coded type of an ACE tariff.

Table 18 shows all association ends of AceTariffType with other classes.

Table 18 – Association ends of MarketManagement::AceTariffType with other classes

mult from	name	mult to	type	description
0..*	Unit	0..*	Unit	
0..*	MarketDocument	0..*	MarketDocument	
0..*	Point	0..*	Point	

6.4.3 AttributeInstanceComponent root class

A class used to provide information about an attribute.

Table 19 shows all attributes of AttributeInstanceComponent.

Table 19 – Attributes of MarketManagement::AttributeInstanceComponent

name	mult	type	description
attribute	0..1	String	The identification of the formal name of an attribute.
attributeValue	0..1	String	The instance value of the attribute.
position	0..1	Integer	A sequential value representing a relative sequence number.

Table 20 shows all association ends of AttributeInstanceComponent with other classes.

Table 20 – Association ends of MarketManagement::AttributeInstanceComponent with other classes

mult from	name	mult to	type	description
0..*	TimeSeries	0..*	TimeSeries	
0..*	MarketDocument	0..*	MarketDocument	

6.4.4 Auction

A class providing the identification and type of an auction.

Table 21 shows all attributes of Auction.

Table 21 – Attributes of MarketManagement::Auction

name	mult	type	description
allocationMode	0..1	String	Identification of the method of allocation in an auction.
cancelled	0..1	String	An indicator that signifies that the auction has been cancelled.
category	0..1	String	The product category of an auction.
paymentTerms	0..1	String	The terms which dictate the determination of the bid payment price.
rights	0..1	String	The rights of use the transmission capacity acquired in an auction.
type	0..1	String	The kind of the Auction (e.g. implicit, explicit ...).
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 22 shows all association ends of Auction with other classes.

Table 22 – Association ends of MarketManagement::Auction with other classes

mult from	name	mult to	type	description
0..*	TimeSeries	0..*	TimeSeries	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.4.5 BidTimeSeries

The formal specification of specific characteristics related to a bid.

Table 23 shows all attributes of BidTimeSeries.

Table 23 – Attributes of MarketManagement::BidTimeSeries

name	mult	type	description
blockBid	0..1	String	Indication that the values in the period are considered as a whole. They cannot be changed or subdivided.
direction	0..1	String	The coded identification of the energy flow.
divisible	0..1	String	An indication whether or not each element of the bid may be partially accepted or not.
status	0..1	String	The information about the status of the bid, such as "shared", "restricted", ...
linkedBidsIdentification	0..1	String	Unique identification associated with all linked bids.
exclusiveBidsIdentification	0..1	String	Unique identification associated with all linked tenders. The identification of a set of tenders that are linked together signifying that only one can be accepted. This identification is defined by the tenderer and must be unique for a given auction.
minimumActivationQuantity	0..1	Decimal	The minimum quantity of energy that can be activated at a given time interval.
stepIncrementQuantity	0..1	Decimal	The minimum increment that can be applied for an increase in an activation request.
priority	0..1	Integer	The numeric local priority given to a bid. Lower numeric values will have higher priority.
businessType	0..1	String	inherited from: TimeSeries
cancelledTS	0..1	String	inherited from: TimeSeries
curveType	0..1	String	inherited from: TimeSeries
objectAggregation	0..1	String	inherited from: TimeSeries
product	0..1	String	inherited from: TimeSeries
version	0..1	String	inherited from: TimeSeries
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 24 shows all association ends of BidTimeSeries with other classes.

Table 24 – Association ends of MarketManagement::BidTimeSeries with other classes

mult from	name	mult to	type	description
0..*	MarketParticipant	0..*	MarketParticipant	inherited from: TimeSeries
0..*	EnvironmentalMonitoringStation	0..*	EnvironmentalMonitoringStation	inherited from: TimeSeries
0..*	DateAndOrTime	0..*	DateAndOrTime	inherited from: TimeSeries
0..*	Domain	0..*	Domain	inherited from: TimeSeries
0..*	FlowDirection	0..*	FlowDirection	inherited from: TimeSeries
0..*	MarketDocument	0..*	MarketDocument	inherited from: TimeSeries
0..*	MarketEvaluationPoint	0..*	MarketEvaluationPoint	inherited from: TimeSeries
0..*	Period	0..*	Period	inherited from: TimeSeries
0..*	Reason	0..*	Reason	inherited from: TimeSeries
0..*	RegisteredResource	0..*	RegisteredResource	inherited from: TimeSeries
0..*	AttributeInstanceComponent	0..*	AttributeInstanceComponent	inherited from: TimeSeries
0..*	Auction	0..*	Auction	inherited from: TimeSeries
0..*	ConstraintDuration	0..*	ConstraintDuration	inherited from: TimeSeries
0..*	MarketObjectStatus	0..*	MarketObjectStatus	inherited from: TimeSeries
0..*	MktPSRType	0..*	MktPSRType	inherited from: TimeSeries
0..*	Point	0..*	Point	inherited from: TimeSeries
0..*	Price	0..*	Price	inherited from: TimeSeries
0..*	Quantity	0..*	Quantity	inherited from: TimeSeries
0..*	Unit	0..*	Unit	inherited from: TimeSeries
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.4.6 ConstraintDuration root class

Duration constraint to activate, to put in operation, to deactivate, ... a given event.

Table 25 shows all attributes of ConstraintDuration.

Table 25 – Attributes of MarketManagement::ConstraintDuration

name	mult	type	description
duration	0..1	Duration	The duration of the constraint.
type	0..1	String	The type of the constraint.

Table 26 shows all association ends of ConstraintDuration with other classes.

Table 26 – Association ends of MarketManagement::ConstraintDuration with other classes

mult from	name	mult to	type	description
0..*	TimeSeries	0..*	TimeSeries	

6.4.7 DateAndOrTime root class

The date and/or the time.

Table 27 shows all attributes of DateAndOrTime.

Table 27 – Attributes of MarketManagement::DateAndOrTime

name	mult	type	description
date	0..1	Date	Date as "yyyy-mm-dd", which conforms with ISO 8601
time	0..1	Time	Time as "hh:mm:ss.sssZ", which conforms with ISO 8601.

Table 28 shows all association ends of DateAndOrTime with other classes.

Table 28 – Association ends of MarketManagement::DateAndOrTime with other classes

mult from	name	mult to	type	description
0..*	MarketDocument	0..*	MarketDocument	
0..*	TimeSeries	0..*	TimeSeries	

6.4.8 Domain

An area of activity defined within the energy market.

Table 29 shows all attributes of Domain.

Table 29 – Attributes of MarketManagement::Domain

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 30 shows all association ends of Domain with other classes.

Table 30 – Association ends of MarketManagement::Domain with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..*	RegisteredResource	
0..*	MarketDocument	0..*	MarketDocument	
0..*	Price	0..*	Price	
0..*	TimeSeries	0..*	TimeSeries	
0..*	Quantity	0..*	Quantity	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.4.9 FlowDirection root class

The coded identification of the direction of energy flow.

Table 31 shows all attributes of FlowDirection.

Table 31 – Attributes of MarketManagement::FlowDirection

name	mult	type	description
direction	0..1	String	The coded identification of the direction of energy flow.

Table 32 shows all association ends of FlowDirection with other classes.

Table 32 – Association ends of MarketManagement::FlowDirection with other classes

mult from	name	mult to	type	description
0..*	Point	0..*	Point	
0..*	TimeSeries	0..*	TimeSeries	

6.4.10 MarketAgreement

An identification or eventually the contents of an agreement between two or more parties.

Table 33 shows all attributes of MarketAgreement.

Table 33 – Attributes of MarketManagement::MarketAgreement

name	mult	type	description
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 34 shows all association ends of MarketAgreement with other classes.

Table 34 – Association ends of MarketManagement::MarketAgreement with other classes

mult from	name	mult to	type	description
0..*	AttributeInstanceComponent	0..*	AttributeInstanceComponent	inherited from: MarketDocument
0..*	Domain	0..*	Domain	inherited from: MarketDocument
0..*	Period	0..*	Period	inherited from: MarketDocument
0..*	SelfMarketDocument	0..*	MarketDocument	inherited from: MarketDocument
0..*	MarketParticipant	0..*	MarketParticipant	inherited from: MarketDocument
0..*	AceTariffType	0..*	AceTariffType	inherited from: MarketDocument
0..*	DateAndOrTime	0..*	DateAndOrTime	inherited from: MarketDocument
0..*	Reason	0..*	Reason	inherited from: MarketDocument
0..*	TimeSeries	0..*	TimeSeries	inherited from: MarketDocument
0..*	Process	0..*	Process	inherited from: MarketDocument
0..*	MarketDocument	0..*	MarketDocument	inherited from: MarketDocument
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.4.11 MarketDocument

Electronic document containing the information necessary to satisfy a given business process set of requirements.

Table 35 shows all attributes of MarketDocument.

Table 35 – Attributes of MarketManagement::MarketDocument

name	mult	type	description
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 36 shows all association ends of MarketDocument with other classes.

Table 36 – Association ends of MarketManagement::MarketDocument with other classes

mult from	name	mult to	type	description
0..*	AttributeInstanceComponent	0..*	AttributeInstanceComponent	
0..*	Domain	0..*	Domain	
0..*	Period	0..*	Period	
0..*	SelfMarketDocument	0..*	MarketDocument	
0..*	MarketParticipant	0..*	MarketParticipant	
0..*	AceTariffType	0..*	AceTariffType	
0..*	DateAndOrTime	0..*	DateAndOrTime	
0..*	Reason	0..*	Reason	
0..*	TimeSeries	0..*	TimeSeries	
0..*	Process	0..*	Process	
0..*	MarketDocument	0..*	MarketDocument	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document

mult from	name	mult to	type	description
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.4.12 MarketEvaluationPoint

The identification of an entity where energy products are measured or computed.

Table 37 shows all attributes of MarketEvaluationPoint.

Table 37 – Attributes of MarketManagement::MarketEvaluationPoint

name	mult	type	description
isSdp	0..1	Boolean	inherited from: UsagePoint
isVirtual	0..1	Boolean	inherited from: UsagePoint
phaseCode	0..1	PhaseCode	inherited from: UsagePoint
grounded	0..1	Boolean	inherited from: UsagePoint
servicePriority	0..1	String	inherited from: UsagePoint
serviceDeliveryRemark	0..1	String	inherited from: UsagePoint
estimatedLoad	0..1	CurrentFlow	inherited from: UsagePoint
checkBilling	0..1	Boolean	inherited from: UsagePoint
ratedCurrent	0..1	CurrentFlow	inherited from: UsagePoint
nominalServiceVoltage	0..1	Voltage	inherited from: UsagePoint
ratedPower	0..1	ActivePower	inherited from: UsagePoint
outageRegion	0..1	String	inherited from: UsagePoint
readCycle	0..1	String	inherited from: UsagePoint
readRoute	0..1	String	inherited from: UsagePoint
amiBillingReady	0..1	AmiBillingReadyKind	inherited from: UsagePoint
connectionState	0..1	UsagePointConnectedKind	inherited from: UsagePoint
minimalUsageExpected	0..1	Boolean	inherited from: UsagePoint
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 38 shows all association ends of MarketEvaluationPoint with other classes.

Table 38 – Association ends of MarketManagement::MarketEvaluationPoint with other classes

mult from	name	mult to	type	description
0..*	TimeSeries	0..*	TimeSeries	
0..*	Equipments	0..*	Equipment	inherited from: UsagePoint
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: UsagePoint
0..*	ServiceCategory	0..1	ServiceCategory	inherited from: UsagePoint
0..1	EndDevices	0..*	EndDevice	inherited from: UsagePoint
0..1	ServiceMultipliers	0..*	ServiceMultiplier	inherited from: UsagePoint
0..*	Outage	0..*	Outage	inherited from: UsagePoint
0..*	Outage	0..*	Outage	inherited from: UsagePoint
0..*	CustomerAgreement	0..1	CustomerAgreement	inherited from: UsagePoint
0..*	PricingStructures	0..*	PricingStructure	inherited from: UsagePoint
0..*	ServiceLocation	0..1	ServiceLocation	inherited from: UsagePoint
0..*	EndDeviceControls	0..*	EndDeviceControl	inherited from: UsagePoint
0..1	EndDeviceEvents	0..*	EndDeviceEvent	inherited from: UsagePoint
0..1	MeterReadings	0..*	MeterReading	inherited from: UsagePoint
0..1	MeterServiceWorkTasks	0..*	MeterWorkTask	inherited from: UsagePoint
0..*	MetrologyRequirements	0..*	MetrologyRequirement	inherited from: UsagePoint
0..*	ServiceSupplier	0..1	ServiceSupplier	inherited from: UsagePoint
0..*	UsagePointGroups	0..*	UsagePointGroup	inherited from: UsagePoint
0..*	UsagePointLocation	0..1	UsagePointLocation	inherited from: UsagePoint
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.4.13 MarketObjectStatus root class

The condition or position of an object with regard to its standing.

Table 39 shows all attributes of MarketObjectStatus.

Table 39 – Attributes of MarketManagement::MarketObjectStatus

name	mult	type	description
status	0..1	String	The coded condition or position of an object with regard to its standing.

Table 40 shows all association ends of MarketObjectStatus with other classes.

Table 40 – Association ends of MarketManagement::MarketObjectStatus with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..*	RegisteredResource	
0..*	TimeSeries	0..*	TimeSeries	

6.4.14 MktPSRType

The type of a power system resource.

Table 41 shows all attributes of MktPSRType.

Table 41 – Attributes of MarketManagement::MktPSRType

name	mult	type	description
psrType	0..1	String	The coded type of a power system resource.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 42 shows all association ends of MktPSRType with other classes.

Table 42 – Association ends of MarketManagement::MktPSRType with other classes

mult from	name	mult to	type	description
0..*	TimeSeries	0..*	TimeSeries	
0..1	PowerSystemResources	0..*	PowerSystemResource	inherited from: PSRType
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.4.15 Period root class

An identification of a time interval that may have a given resolution.

Table 43 shows all attributes of Period.

Table 43 – Attributes of MarketManagement::Period

name	mult	type	description
resolution	0..1	Duration	The number of units of time that compose an individual step within a period.
timeInterval	0..1	DateTimeInterval	The start and end date and time for a given interval.

Table 44 shows all association ends of Period with other classes.

Table 44 – Association ends of MarketManagement::Period with other classes

mult from	name	mult to	type	description
0..*	Reason	0..*	Reason	
0..*	MarketDocument	0..*	MarketDocument	
1..1	Point	0..*	Point	
0..*	TimeSeries	0..*	TimeSeries	

6.4.16 Point root class

An identification of a set of values beeing adressed within a specific interval of time.

Table 45 shows all attributes of Point.

Table 45 – Attributes of MarketManagement::Point

name	mult	type	description
position	0..1	Integer	A sequential value representing the relative position within a given time interval.
quality	0..1	String	The quality of the information being provided. This quality may be estimated, not available, as provided, etc.
quantity	0..1	Decimal	Principal quantity identified for a point.
secondaryQuantity	0..1	Decimal	Secondary quantity identified for a point.

Table 46 shows all association ends of Point with other classes.

Table 46 – Association ends of MarketManagement::Point with other classes

mult from	name	mult to	type	description
0..*	AceTariffType	0..*	AceTariffType	
0..*	Period	1..1	Period	
0..*	TimeSeries	0..*	TimeSeries	
0..*	FlowDirection	0..*	FlowDirection	
0..1	Price	0..*	Price	
0..*	Reason	0..*	Reason	
0..*	Quantity	0..*	Quantity	

6.4.17 Price root class

The cost corresponding to a specific measure and expressed in a currency.

Table 47 shows all attributes of Price.

Table 47 – Attributes of MarketManagement::Price

name	mult	type	description
amount	0..1	Decimal	A number of monetary units specified in a unit of currency.
category	0..1	String	The category of a price to be used in a price calculation. The price category is mutually agreed between System Operators.
direction	0..1	String	The direction indicates whether a System Operator pays the Market Parties or inverse.

Table 48 shows all association ends of Price with other classes.

Table 48 – Association ends of MarketManagement::Price with other classes

mult from	name	mult to	type	description
0..*	Domain	0..*	Domain	
0..*	Point	0..1	Point	
0..*	TimeSeries	0..*	TimeSeries	

6.4.18 Process

The formal specification of a set of business transactions having the same business goal.

Table 49 shows all attributes of Process.

Table 49 – Attributes of MarketManagement::Process

name	mult	type	description
classificationType	0..1	String	The classification mechanism used to group a set of objects together within a business process. The grouping may be of a detailed or a summary nature.
processType	0..1	String	The kind of business process.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 50 shows all association ends of Process with other classes.

Table 50 – Association ends of MarketManagement::Process with other classes

mult from	name	mult to	type	description
0..*	MarketDocument	0..*	MarketDocument	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.4.19 Quantity root class

Description of quantities needed in the data exchange.

The type of the quantity is described either by the role of the association or the type attribute.

The quality attribute provides the information about the quality of the quantity (measured, estimated, etc.).

Table 51 shows all attributes of Quantity.

Table 51 – Attributes of MarketManagement::Quantity

name	mult	type	description
quantity	0..1	Decimal	The quantity value. The association role provides the information about what is expressed.
type	0..1	String	The description of the type of the quantity.
quality	0..1	String	The quality of the information being provided. This quality may be estimated, not available, as provided, etc.

Table 52 shows all association ends of Quantity with other classes.

Table 52 – Association ends of MarketManagement::Quantity with other classes

mult from	name	mult to	type	description
0..*	Domain	0..*	Domain	
0..*	Point	0..*	Point	
0..*	TimeSeries	0..*	TimeSeries	
0..*	quantity	0..1	Quantity	
0..1	Detail_Quantity	0..*	Quantity	Additional information related to the associated quantity.

6.4.20 Reason root class

The motivation of an act.

Table 53 shows all attributes of Reason.

Table 53 – Attributes of MarketManagement::Reason

name	mult	type	description
code	0..1	String	The motivation of an act in coded form.
text	0..1	String	The textual explanation corresponding to the reason code.

Table 54 shows all association ends of Reason with other classes.

Table 54 – Association ends of MarketManagement::Reason with other classes

mult from	name	mult to	type	description
0..*	MarketDocument	0..*	MarketDocument	
0..*	Point	0..*	Point	
0..*	RegisteredResource	0..*	RegisteredResource	
0..*	Period	0..*	Period	
0..*	TimeSeries	0..*	TimeSeries	

6.4.21 Series

A set of similar physical or conceptual objects defined for the same period or point of time.

Table 55 shows all attributes of Series.

Table 55 – Attributes of MarketManagement::Series

name	mult	type	description
lastUpdateDate	0..1	Date	The date of the last update related to this market object.
methodType	0..1	String	Type of method used in the business process related to this Series, e.g. metering method.
registrationDate	0..1	Date	For a market object, the date of registration of a contract, e.g. the date of change of supplier for a customer.
businessType	0..1	String	inherited from: TimeSeries
cancelledTS	0..1	String	inherited from: TimeSeries
curveType	0..1	String	inherited from: TimeSeries
objectAggregation	0..1	String	inherited from: TimeSeries
product	0..1	String	inherited from: TimeSeries
version	0..1	String	inherited from: TimeSeries
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 56 shows all association ends of Series with other classes.

Table 56 – Association ends of MarketManagement::Series with other classes

mult from	name	mult to	type	description
0..*	SelfSeries	0..*	Series	
0..*	Series	0..*	Series	
0..*	MarketParticipant	0..*	MarketParticipant	inherited from: TimeSeries
0..*	EnvironmentalMonitoring Station	0..*	EnvironmentalMonitoring Station	inherited from: TimeSeries
0..*	DateAndOrTime	0..*	DateAndOrTime	inherited from: TimeSeries
0..*	Domain	0..*	Domain	inherited from: TimeSeries
0..*	FlowDirection	0..*	FlowDirection	inherited from: TimeSeries

mult from	name	mult to	type	description
0..*	MarketDocument	0..*	MarketDocument	inherited from: TimeSeries
0..*	MarketEvaluationPoint	0..*	MarketEvaluationPoint	inherited from: TimeSeries
0..*	Period	0..*	Period	inherited from: TimeSeries
0..*	Reason	0..*	Reason	inherited from: TimeSeries
0..*	RegisteredResource	0..*	RegisteredResource	inherited from: TimeSeries
0..*	AttributeInstanceComponent	0..*	AttributeInstanceComponent	inherited from: TimeSeries
0..*	Auction	0..*	Auction	inherited from: TimeSeries
0..*	ConstraintDuration	0..*	ConstraintDuration	inherited from: TimeSeries
0..*	MarketObjectStatus	0..*	MarketObjectStatus	inherited from: TimeSeries
0..*	MktPSRType	0..*	MktPSRType	inherited from: TimeSeries
0..*	Point	0..*	Point	inherited from: TimeSeries
0..*	Price	0..*	Price	inherited from: TimeSeries
0..*	Quantity	0..*	Quantity	inherited from: TimeSeries
0..*	Unit	0..*	Unit	inherited from: TimeSeries
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.4.22 TimeSeries

A set of regular time-ordered measurements or values of quantitative nature of an individual or collective phenomenon taken at successive, in most cases equidistant, periods / points of time.

Table 57 shows all attributes of TimeSeries.

Table 57 – Attributes of MarketManagement::TimeSeries

name	mult	type	description
businessType	0..1	String	The identification of the nature of the time series.
cancelledTS	0..1	String	An indicator stating that the TimeSeries, identified by the mRID, is cancelled as well as all the values sent in a previous version of the TimeSeries in a previous document.
curveType	0..1	String	The coded representation of the type of curve being described.
objectAggregation	0..1	String	Identification of the object that is the common denominator used to aggregate a time series.
product	0..1	String	The type of the product such as Power, energy, reactive power, transport capacity that is the subject of the time series.
version	0..1	String	Version of the time series.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 58 shows all association ends of TimeSeries with other classes.

Table 58 – Association ends of MarketManagement::TimeSeries with other classes

mult from	name	mult to	type	description
0..*	MarketParticipant	0..*	MarketParticipant	
0..*	EnvironmentalMonitoringStation	0..*	EnvironmentalMonitoringStation	
0..*	DateAndOrTime	0..*	DateAndOrTime	
0..*	Domain	0..*	Domain	
0..*	FlowDirection	0..*	FlowDirection	
0..*	MarketDocument	0..*	MarketDocument	
0..*	MarketEvaluationPoint	0..*	MarketEvaluationPoint	
0..*	Period	0..*	Period	
0..*	Reason	0..*	Reason	
0..*	RegisteredResource	0..*	RegisteredResource	
0..*	AttributeInstanceComponent	0..*	AttributeInstanceComponent	
0..*	Auction	0..*	Auction	
0..*	ConstraintDuration	0..*	ConstraintDuration	
0..*	MarketObjectStatus	0..*	MarketObjectStatus	
0..*	MktPSRType	0..*	MktPSRType	
0..*	Point	0..*	Point	
0..*	Price	0..*	Price	
0..*	Quantity	0..*	Quantity	
0..*	Unit	0..*	Unit	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.4.23 Unit root class

The identification of the unit name for the time series quantities.

Table 59 shows all attributes of Unit.

Table 59 – Attributes of MarketManagement::Unit

name	mult	type	description
name	0..1	String	The coded representation of the unit.

Table 60 shows all association ends of Unit with other classes.

Table 60 – Association ends of MarketManagement::Unit with other classes

mult from	name	mult to	type	description
0..*	TimeSeries	0..*	TimeSeries	
0..*	AceTariffType	0..*	AceTariffType	

6.5 Package MarketOperations

6.5.1 General

This package contains all core CIM Market Extensions required for market operations systems.

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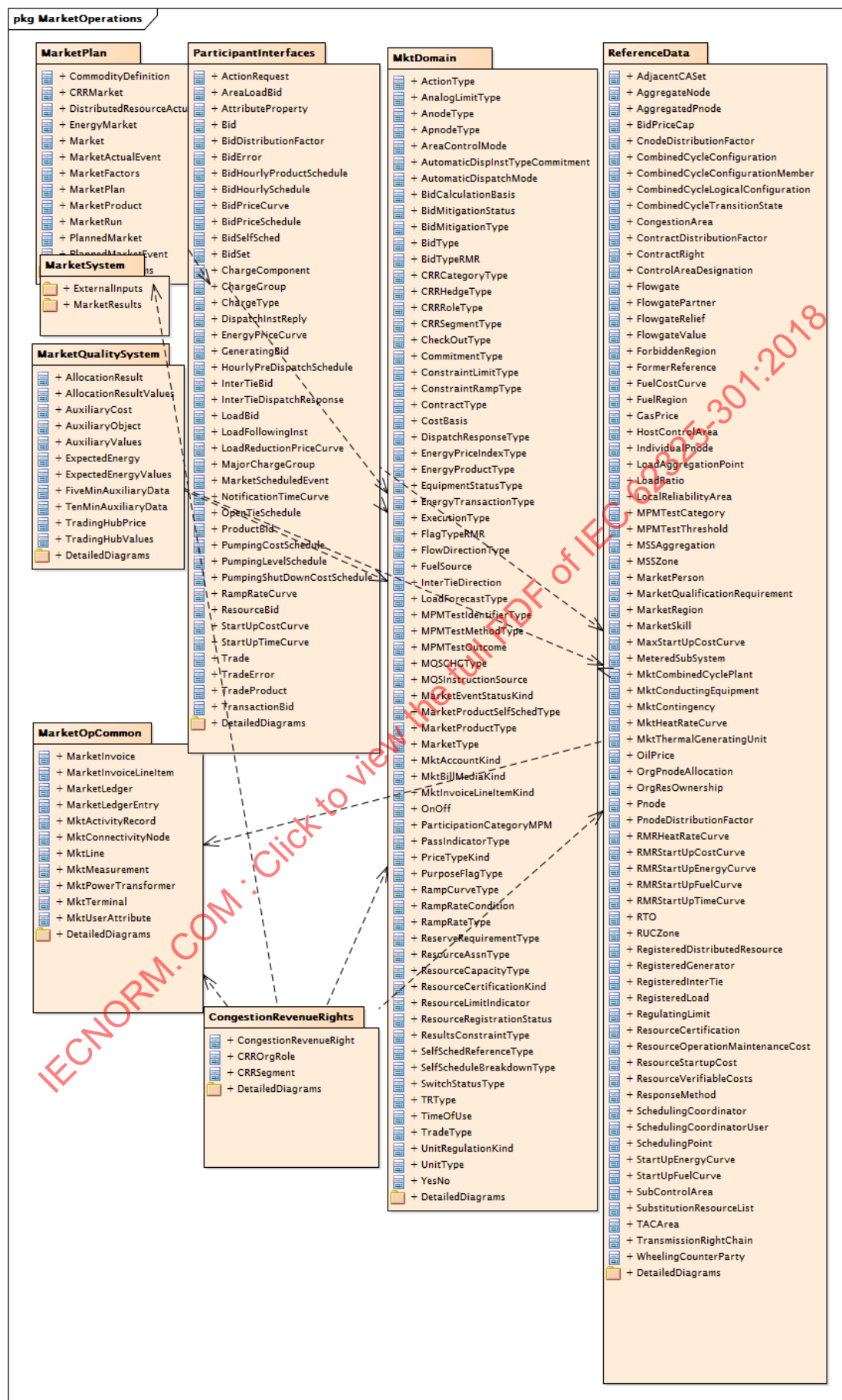


Figure 32 – Package diagram MarketOperations::MarketOperations

Figure 32: Shows the package containing all core CIM Market Extensions required for market operations systems.

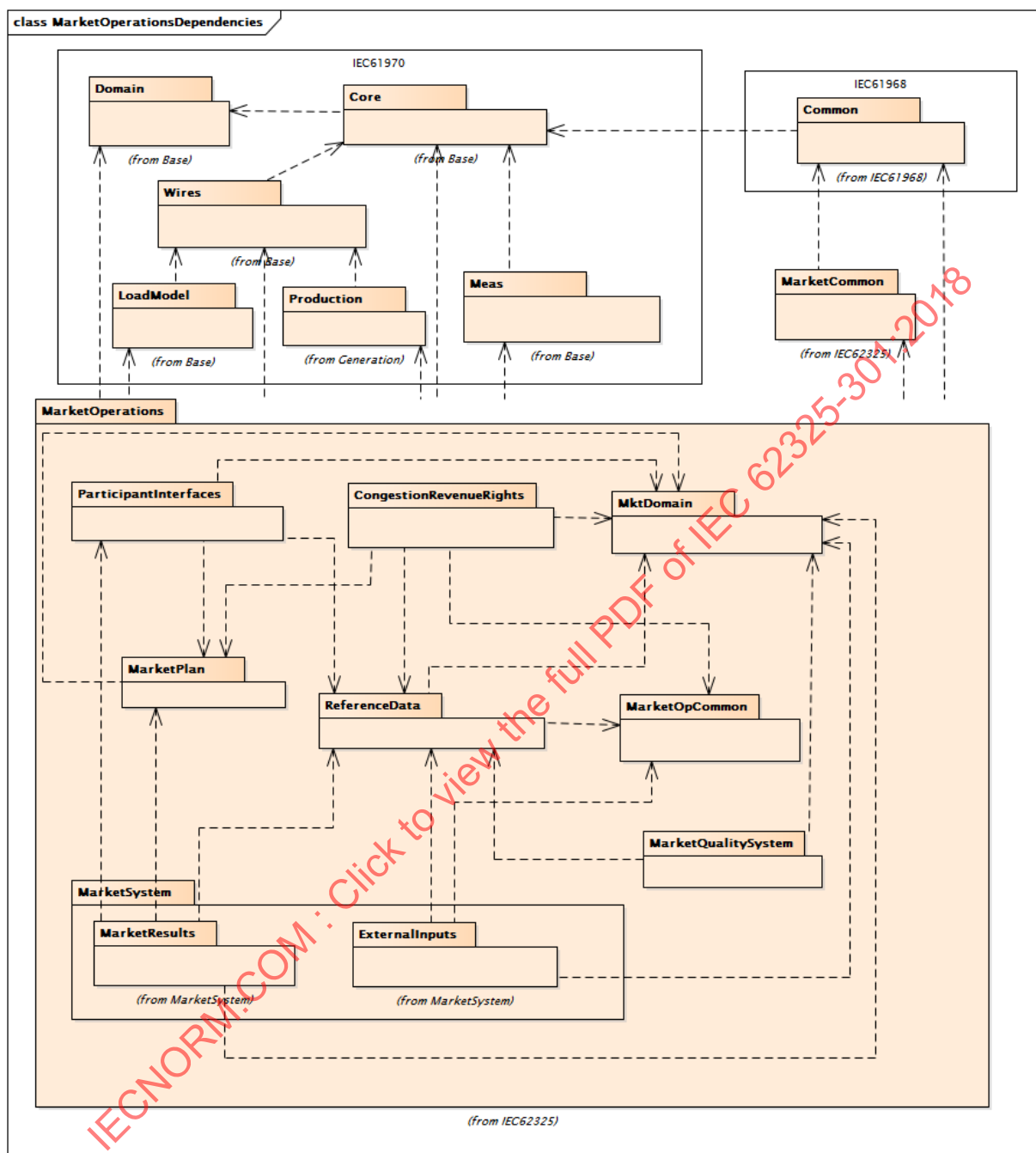


Figure 33 – Class diagram MarketOperations::MarketOperationsDependencies

Figure 33: Shows Market Operation internal package dependencies and external dependencies.

6.5.2 Package CongestionRevenueRights

6.5.2.1 General

Congestion rent is a major, highly volatile charge currently faced by many participants in the LMP-based electrical energy markets. For this reason, the ISOs offer congestion revenue rights (CRR), also known as financial transmission rights or transmission congestion contracts. These are financial instruments that allow market participants to hedge against

congestion charges when they schedule their generation, load and bilateral energy transactions.

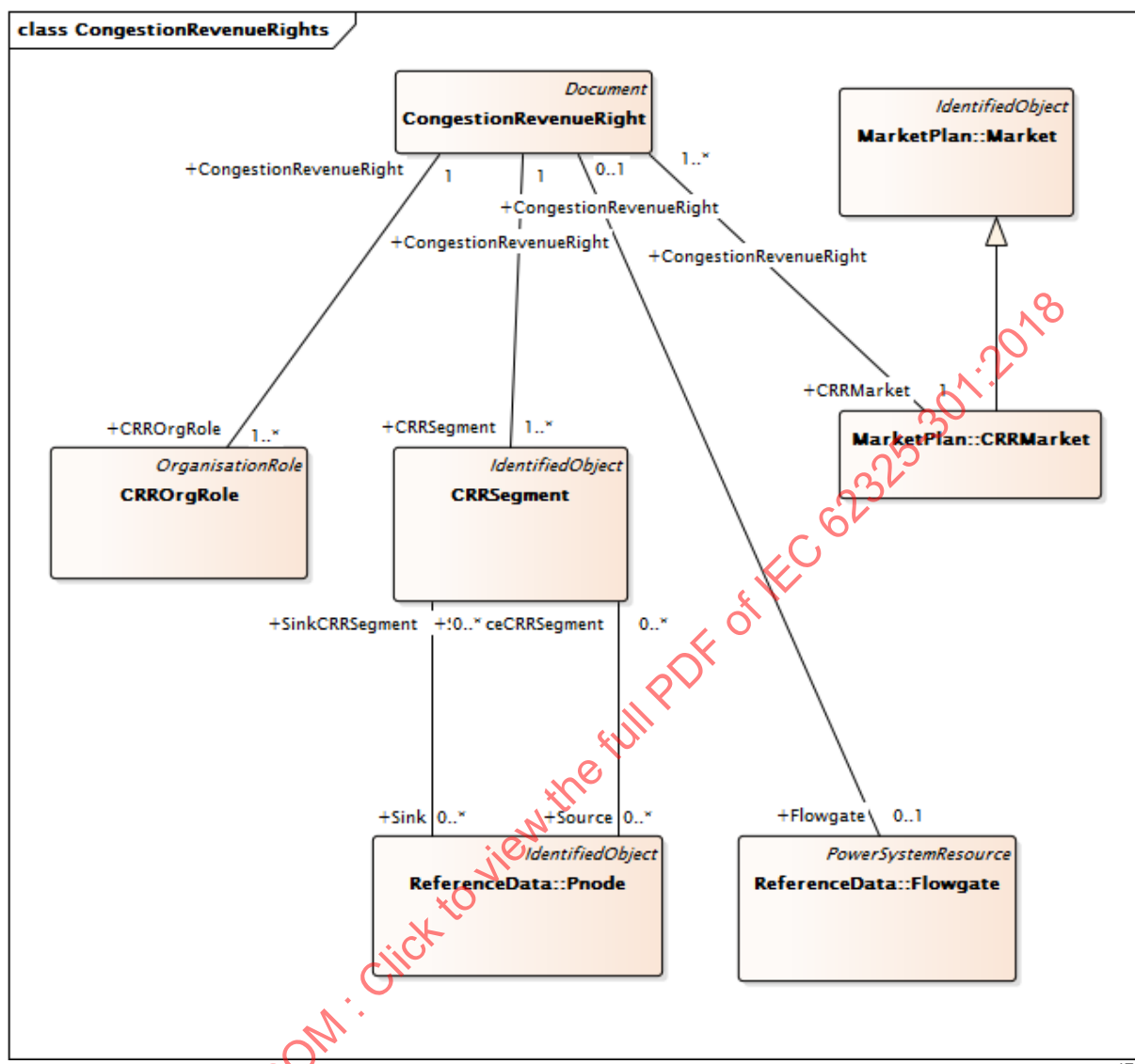


Figure 34 – Class diagram CongestionRevenueRights::CongestionRevenueRights

Figure 34: Shows a congestion revenue right (CRR), which is a financial instrument which entitles the holder to a CRR payment when the Congestion is in the direction of the CRR source to the CRR sink. The classes shown are used to model the CRR data. The CRRSegment class contains information about CRR segments. The MktOrganization class contains information about the entity that holds the CRR. Associations from CRRSegment to Reference data show the source and sink Pnodes.

6.5.2.2 CongestionRevenueRight

Congestion Revenue Rights (CRR) class that is inherited from a Document class.

A CRR is a financial concept that is used to hedge congestion charges.

The CRR is usually settled based on the Locational Marginal Prices (LMPs) that are calculated in the day-ahead market. These LMPs are determined by the Day-ahead resource schedules/bids. CRRs will not hedge against marginal losses. If the congestion component of LMP at the sink is greater than at the source, then the CRR owner is entitled to receive a portion of congestion revenues. If the congestion component at the sink is less than at the

source, then an obligation-type CRR owner will be charged, but an option-type CRR owner will not.

Table 61 shows all attributes of CongestionRevenueRight.

Table 61 – Attributes of CongestionRevenueRights::CongestionRevenueRight

name	mult	type	description
cRRcategory	0..1	CRRCategoryType	CRR category represents 'PTP' for a point-to-point CRR, or 'NSR' for a Network Service Right. If CRR category is 'PTP', both Source ID and Sink ID fields are required. If CRR category is 'NSR' only one field, either Source ID or Sink ID, shall be not null and the other shall be null. However, the 'NSR' category will include at least three records.
cRRtype	0..1	CRRSegmentType	Type of the CRR, from the possible type definitions in the CRR System (e.g. 'LSE', 'ETC').
hedgeType	0..1	CRRHedgeType	Hedge type Obligation or Option. An obligation type requires the holder to receive or pay the congestion rent. An option type gives the holder the option of receiving or paying the congestion rent.
timeOfUse	0..1	TimeOfUse	Time of Use flag of the CRR – Peak (ON), Offpeak (OFF) or all 24 hours (24HR).
tradeSliceID	0..1	String	Segment of the CRR described in the current record.
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 62 shows all association ends of CongestionRevenueRight with other classes.

**Table 62 – Association ends of CongestionRevenueRights::
CongestionRevenueRight with other classes**

mult from	name	mult to	type	description
0..1	Flowgate	0..1	Flowgate	
1..*	CRRMarket	1..1	CRRMarket	
1..1	CRRSegment	1..*	CRRSegment	
1..1	CRROrgRole	1..*	CRROrgRole	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.2.3 CRROrgRole

Identifies a way in which an organisation may participate with a defined Congestion Revenue Right (CRR).

Table 63 shows all attributes of CRROrgRole.

Table 63 – Attributes of CongestionRevenueRights::CRROrgRole

name	mult	type	description
kind	0..1	CRRRoleType	Kind of role the organisation is with regards to the congestion revenue rights.
status	0..1	Status	Status of congestion revenue rights organisation role.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 64 shows all association ends of CRROrgRole with other classes.

Table 64 – Association ends of CongestionRevenueRights::CRROrgRole with other classes

mult from	name	mult to	type	description
1..*	CongestionRevenueRight	1..1	CongestionRevenueRight	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: OrganisationRole
0..*	Organisation	0..1	Organisation	inherited from: OrganisationRole
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.2.4 CRRSegment

CRRSegment represents a segment of a CRR in a particular time frame.

The segment class contains amount, clearing price, start date and time, end date and time.

Table 65 shows all attributes of CRRSegment.

Table 65 – Attributes of CongestionRevenueRights::CRRSegment

name	mult	type	description
amount	0..1	Money	Dollar amount = quantity x clearingPrice
clearingPrice	0..1	Money	Clearing price of a CRR
endDateTime	0..1	DateTime	segment end date time
quantity	0..1	Float	The MW amount associated with the CRR
startDateTime	0..1	DateTime	segment start date time
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 66 shows all association ends of CRRSegment with other classes.

Table 66 – Association ends of CongestionRevenueRights::CRRSegment with other classes

mult from	name	mult to	type	description
1..*	CongestionRevenueRight	1..1	CongestionRevenueRight	
0..*	Source	0..*	Pnode	
0..*	Sink	0..*	Pnode	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.3 Package MarketOpCommon

6.5.3.1 General

This package contains the common objects shared by MarketOperations packages.

6.5.3.2 MarketInvoice root class

A roll up of invoice line items. The whole invoice has a due date and amount to be paid, with information such as customer, banks etc. being obtained through associations. The invoice roll up is based on individual line items that each contain amounts and descriptions for specific services or products.

Table 67 shows all attributes of MarketInvoice.

Table 67 – Attributes of MarketOpCommon::MarketInvoice

name	mult	type	description
amount	0..1	Money	Total amount due on this invoice based on line items and applicable adjustments.
billMediaKind	0..1	MktBillMediaKind	Kind of media by which the CustomerBillingInfo was delivered.
dueDate	0..1	Date	Calculated date upon which the Invoice amount is due.
kind	0..1	MktAccountKind	Kind of invoice (default is 'sales').
mailedDate	0..1	Date	Date on which the customer billing statement/invoice was printed/mailed.
proForma	0..1	Boolean	True if payment is to be paid by a Customer to accept a particular ErpQuote (with associated Design) and have work initiated, at which time an associated ErpInvoice should automatically be generated. EprPayment.subjectStatus satisfies terms specified in the ErpQuote.
referenceNumber	0..1	String	Number of an invoice to be reference by this invoice.
transactionDateTime	0..1	DateTime	Date and time when the invoice is issued.
transferType	0..1	String	Type of invoice transfer.

Table 68 shows all association ends of MarketInvoice with other classes.

Table 68 – Association ends of MarketOpCommon::MarketInvoice with other classes

mult from	name	mult to	type	description
0..*	MajorChargeGroup	1..*	MajorChargeGroup	
1..1	MarketInvoiceLineItems	0..*	MarketInvoiceLineItem	

6.5.3.3 MarketInvoiceLineItem root class

An individual line item on an invoice.

Table 69 shows all attributes of MarketInvoiceLineItem.

Table 69 – Attributes of MarketOpCommon::MarketInvoiceLineItem

name	mult	type	description
billPeriod	0..1	DateTimeInterval	Bill period for the line item.
glAccount	0..1	String	General Ledger account code, shall be a valid combination.
glDateTime	0..1	DateTime	Date and time line item will be posted to the General Ledger.
kind	0..1	MktInvoiceLineItemKind	Kind of line item.
lineAmount	0..1	Float	Amount due for this line item.
lineNumber	0..1	String	Line item number on invoice statement.
lineVersion	0..1	String	Version number of the bill run.
netAmount	0..1	Float	Net line item charge amount.
previousAmount	0..1	Float	Previous line item charge amount.

Table 70 shows all association ends of MarketInvoiceLineItem with other classes.

Table 70 – Association ends of MarketOpCommon::MarketInvoiceLineItem with other classes

mult from	name	mult to	type	description
0..*	MarketInvoice	1..1	MarketInvoice	
0..*	Settlement	0..*	Settlement	
0..*	ContainerMarketInvoiceLineItem	0..1	MarketInvoiceLineItem	
0..1	ComponentMarketInvoiceLineItems	0..*	MarketInvoiceLineItem	

6.5.3.4 MarketLedger root class

In accounting transactions, a ledger is a book containing accounts to which debits and credits are posted from journals, where transactions are initially recorded. Journal entries are periodically posted to the ledger. Ledger actual represents actual amounts by account within ledger within company or within business area. Actual amounts may be generated in a source application and then loaded to a specific ledger within the enterprise general ledger or budget application.

Table 71 shows all association ends of MarketLedger with other classes.

Table 71 – Association ends of MarketOpCommon::MarketLedger with other classes

mult from	name	mult to	type	description
1..1	MarketLedgerEntries	0..*	MarketLedgerEntry	

6.5.3.5 MarketLedgerEntry root class

Details of an individual entry in a ledger, which was posted from a journal on the posted date.

Table 72 shows all attributes of MarketLedgerEntry.

Table 72 – Attributes of MarketOpCommon::MarketLedgerEntry

name	mult	type	description
accountID	0..1	String	Account identifier for this entry.
accountKind	0..1	MktAccountKind	Kind of account for this entry.
amount	0..1	Money	The amount of the debit or credit for this account.
postedDateTime	0..1	DateTime	Date and time this entry was posted to the ledger.
status	0..1	Status	Status of ledger entry.
transactionDateTime	0..1	DateTime	Date and time journal entry was recorded.

Table 73 shows all association ends of MarketLedgerEntry with other classes.

Table 73 – Association ends of MarketOpCommon::MarketLedgerEntry with other classes

mult from	name	mult to	type	description
0..*	Settlement	0..*	Settlement	
0..*	MarketLedger	1..1	MarketLedger	

6.5.3.6 MktActivityRecord

Subclass of IEC61968: Common:ActivityRecord.

Table 74 shows all attributes of MktActivityRecord.

Table 74 – Attributes of MarketOpCommon::MktActivityRecord

name	mult	type	description
createdDateTime	0..1	DateTime	inherited from: ActivityRecord
type	0..1	String	inherited from: ActivityRecord
severity	0..1	String	inherited from: ActivityRecord
reason	0..1	String	inherited from: ActivityRecord
status	0..1	Status	inherited from: ActivityRecord
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 75 shows all association ends of MktActivityRecord with other classes.

Table 75 – Association ends of MarketOpCommon::MktActivityRecord with other classes

mult from	name	mult to	type	description
0..*	MarketFactors	0..*	MarketFactors	
0..*	Assets	0..*	Asset	inherited from: ActivityRecord
0..*	Author	0..1	Author	inherited from: ActivityRecord
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.3.7 MktConnectivityNode

Subclass of IEC61970:Topology:ConnectivityNode.

Table 76 shows all attributes of MktConnectivityNode.

Table 76 – Attributes of MarketOpCommon::MktConnectivityNode

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 77 shows all association ends of MktConnectivityNode with other classes.

Table 77 – Association ends of MarketOpCommon::MktConnectivityNode with other classes

mult from	name	mult to	type	description
0..1	RegisteredResource	0..*	RegisteredResource	
1..1	NodeConstraintTerm	0..*	NodeConstraintTerm	
0..*	RTO	1..1	RTO	
1..1	SysLoadDistribuFactor	0..1	SysLoadDistributionFactor	
1..1	LossPenaltyFactor	0..*	LossSensitivity	
1..1	CnodeDistributionFactor	0..*	CnodeDistributionFactor	
1..1	IndividualPnode	0..1	IndividualPnode	
0..*	TopologicalNode	0..1	TopologicalNode	inherited from: ConnectivityNode
0..*	ConnectivityNodeContainer	1..1	ConnectivityNodeContainer	inherited from: ConnectivityNode
0..1	Terminals	0..*	Terminal	inherited from: ConnectivityNode
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.3.8 MktLine

Subclass for IEC61970:Wires:Line.

Table 78 shows all attributes of MktLine.

Table 78 – Attributes of MarketOpCommon::MktLine

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 79 shows all association ends of MktLine with other classes.

Table 79 – Association ends of MarketOpCommon::MktLine with other classes

mult from	name	mult to	type	description
0..*	Flowgate	0..*	Flowgate	
0..*	Region	0..1	SubGeographicalRegion	inherited from: Line
0..1	Equipments	0..*	Equipment	inherited from: EquipmentContainer
0..*	AdditionalGroupedEquipment	0..*	Equipment	inherited from: EquipmentContainer
1..1	ConnectivityNodes	0..*	ConnectivityNode	inherited from: ConnectivityNodeContainer
0..1	TopologicalNode	0..*	TopologicalNode	inherited from: ConnectivityNodeContainer
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.3.9 MktMeasurement

Subclass of IEC61970:Meas:Measurement.

Table 80 shows all attributes of MktMeasurement.

Table 80 – Attributes of MarketOpCommon::MktMeasurement

name	mult	type	description
measurementType	0..1	String	inherited from: Measurement
phases	0..1	PhaseCode	inherited from: Measurement
uncefactUnitCode	1..1	UncefactUnitCode	inherited from: Measurement
unitMultiplier	0..1	UnitMultiplier	inherited from: Measurement
unitSymbol	0..1	UnitSymbol	inherited from: Measurement
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 81 shows all association ends of MktMeasurement with other classes.

Table 81 – Association ends of MarketOpCommon::MktMeasurement with other classes

mult from	name	mult to	type	description
0..*	Pnode	0..1	Pnode	Allows Pnode an association to aggregated resources external DC ties or psuedo tie measurements.
0..*	Terminal	0..1	ACDCTerminal	inherited from: Measurement
0..*	PowerSystemResource	0..1	PowerSystemResource	inherited from: Measurement
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.3.10 MktPowerTransformer

Subclass of IEC61970:Wires:PowerTransformer.

Table 82 shows all attributes of MktPowerTransformer.

Table 82 – Attributes of MarketOpCommon::MktPowerTransformer

name	mult	type	description
beforeShCircuitHighestOperatingCurrent	0..1	CurrentFlow	inherited from: PowerTransformer
beforeShCircuitHighestOperatingVoltage	0..1	Voltage	inherited from: PowerTransformer
beforeShortCircuitAnglePf	0..1	AngleDegrees	inherited from: PowerTransformer
highSideMinOperatingU	0..1	Voltage	inherited from: PowerTransformer
isPartOfGeneratorUnit	0..1	Boolean	inherited from: PowerTransformer
operationalValuesConsidered	0..1	Boolean	inherited from: PowerTransformer
vectorGroup	0..1	String	inherited from: PowerTransformer
aggregate	0..1	Boolean	inherited from: Equipment

name	mult	type	description
inService	0..1	Boolean	inherited from: Equipment
networkAnalysisEnabled	0..1	Boolean	inherited from: Equipment
normallyInService	0..1	Boolean	inherited from: Equipment
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 83 shows all association ends of MktPowerTransformer with other classes.

**Table 83 – Association ends of MarketOpCommon::
MktPowerTransformer with other classes**

mult from	name	mult to	type	description
0..*	Flowgate	0..*	Flowgate	
0..*	EndBFlow	0..1	BranchEndFlow	
0..*	EndAFlow	0..1	BranchEndFlow	
0..1	PowerTransformerEnd	0..*	PowerTransformerEnd	inherited from: PowerTransformer
0..1	TransformerTanks	0..*	TransformerTank	inherited from: PowerTransformer
0..*	BaseVoltage	0..1	BaseVoltage	inherited from: ConductingEquipment
1..1	SvStatus	0..*	SvStatus	inherited from: ConductingEquipment
0..*	ProtectionEquipments	0..*	ProtectionEquipment	inherited from: ConductingEquipment
1..1	Terminals	0..*	Terminal	inherited from: ConductingEquipment
0..1	OperationalLimitSet	0..*	OperationalLimitSet	inherited from: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	inherited from: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	inherited from: Equipment
0..1	Faults	0..*	Fault	inherited from: Equipment
0..*	AdditionalEquipmentContainer	0..*	EquipmentContainer	inherited from: Equipment
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.3.11 MktTerminal

Subclass of IEC61970:Core:Terminal.

Table 84 shows all attributes of MktTerminal.

Table 84 – Attributes of MarketOpCommon::MktTerminal

name	mult	type	description
phases	0..1	PhaseCode	inherited from: Terminal
connected	0..1	Boolean	inherited from: ACDCTerminal
sequenceNumber	0..1	Integer	inherited from: ACDCTerminal
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 85 shows all association ends of MktTerminal with other classes.

Table 85 – Association ends of MarketOpCommon::MktTerminal with other classes

mult from	name	mult to	type	description
0..*	Flowgate	0..1	Flowgate	
1..1	TerminalConstraintTerm	0..*	TerminalConstraintTerm	
0..*	ConductingEquipment	1..1	ConductingEquipment	inherited from: Terminal
0..*	ConnectivityNode	0..1	ConnectivityNode	inherited from: Terminal
0..*	TopologicalNode	0..1	TopologicalNode	inherited from: Terminal
0..1	RegulatingControl	0..*	RegulatingControl	inherited from: Terminal
1..*	NormalHeadFeeder	0..1	Feeder	inherited from: Terminal
1..1	HasFirstMutualCoupling	0..*	MutualCoupling	inherited from: Terminal
0..1	TransformerEnd	0..*	TransformerEnd	inherited from: Terminal
1..1	BranchGroupTerminal	0..*	BranchGroupTerminal	inherited from: Terminal
1..1	SvPowerFlow	0..*	SvPowerFlow	inherited from: Terminal
1..1	AuxiliaryEquipment	0..*	AuxiliaryEquipment	inherited from: Terminal
1..1	HasSecondMutualCoupling	0..*	MutualCoupling	inherited from: Terminal
1..1	TieFlow	0..2	TieFlow	inherited from: Terminal
0..1	EquipmentFaults	0..*	EquipmentFault	inherited from: Terminal
0..1	ConverterDCSides	0..*	ACDCConverter	inherited from: Terminal
1..1	RemoteInputSignal	0..*	RemoteInputSignal	inherited from: Terminal
1..*	BusNameMarker	0..1	BusNameMarker	inherited from: ACDCTerminal
0..1	OperationalLimitSet	0..*	OperationalLimitSet	inherited from: ACDCTerminal
0..1	Measurements	0..*	Measurement	inherited from: ACDCTerminal
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.3.12 MktUserAttribute

Subclass of IEC61968:Domain2:UserAttribute.

Table 86 shows all attributes of MktUserAttribute.

Table 86 – Attributes of MarketOpCommon::MktUserAttribute

name	mult	type	description
sequenceNumber	0..1	Integer	inherited from: UserAttribute
name	0..1	String	inherited from: UserAttribute
value	0..1	StringQuantity	inherited from: UserAttribute

Table 87 shows all association ends of MktUserAttribute with other classes.

Table 87 – Association ends of MarketOpCommon::MktUserAttribute with other classes

mult from	name	mult to	type	description
0..*	ChargeType	0..*	ChargeType	
0..*	MarketStatementLineItem	0..*	MarketStatementLineItem	
0..*	PassThroughBill	0..*	PassThroughBill	
0..*	ChargeGroup	0..*	ChargeGroup	
1..1	AttributeProperty	0..*	AttributeProperty	
0..*	BillDeterminant	0..*	BillDeterminant	
0..*	Transaction	0..1	Transaction	inherited from: UserAttribute

6.5.4 Package MarketPlan

6.5.4.1 General

Market plan definitions for planned markets, planned market events, actual market runs, actual market events.

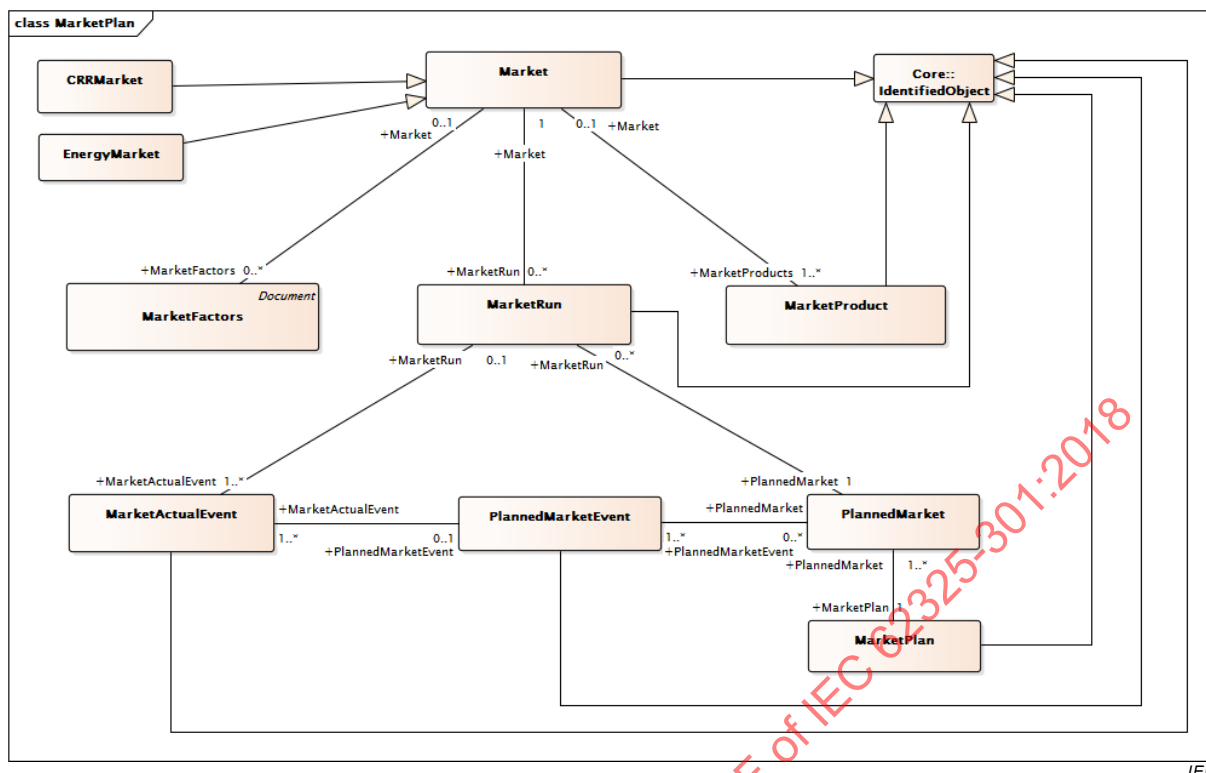


Figure 35 – Class diagram MarketPlan::MarketPlan

Figure 35: Shows the major classes that are used to identify an instance of a market clearing solution. The class Market identifies whether the instance is a Day Ahead, Hour-Ahead (Intraday) or Real Time market. The class MarketFactors describes a market interval as the start and end date/time of the market. The MarketProduct class indicates the market product such as energy or ancillary service. The class PlannedMarket describes the start and end times of the market. Relationships between classes are also shown.

6.5.4.2 CommodityDefinition

Commodities in the context of IEC 62325 are MarketProducts (energy, regulation, reserve, etc) traded at a specific location, which in this case is a Pnode (either a specific pricing node or a pricing area or zone defined as a collection of pricing nodes). The CommodityDefinition is a container for these two parameters, plus the unit of measure and the currency in which the Commodity is traded. Each CommodityDefinition should be relatively static; defined once and rarely changed.

Table 88 shows all attributes of CommodityDefinition.

Table 88 – Attributes of MarketPlan::CommodityDefinition

name	mult	type	description
commodityCurrency	0..1	Currency	The currency in which the Commodity is traded, using the standard conventions associated with the Currency enumeration.
commodityUnit	0..1	UnitSymbol	The unit of measure in which the Commodity is traded, using the standard conventions associated with the UnitSymbol enumeration.
commodityUnitMultiplier	0..1	UnitMultiplier	The unit multiplier, e.g. "k" to convert the unit "W-h" to "kW-h", using the standard conventions associated with the UnitMultiplier enumeration.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 89 shows all association ends of CommodityDefinition with other classes.

Table 89 – Association ends of MarketPlan::CommodityDefinition with other classes

mult from	name	mult to	type	description
0..*	Pnode	1..1	Pnode	
0..*	MarketProduct	1..1	MarketProduct	
1..1	CommodityPrice	1..*	CommodityPrice	
0..*	RTO	1..1	RTO	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.4.3 CRRMarket

Model that describes the Congestion Revenue Rights Auction Market.

Table 90 shows all attributes of CRRMarket.

Table 90 – Attributes of MarketPlan::CRRMarket

name	mult	type	description
labelID	0..1	String	labelID – an ID for a set of apnodes/pnodes used in a CRR market
actualEnd	0..1	DateTime	inherited from: Market
actualStart	0..1	DateTime	inherited from: Market
dst	0..1	Boolean	inherited from: Market
end	0..1	DateTime	inherited from: Market
localTimeZone	0..1	String	inherited from: Market
start	0..1	DateTime	inherited from: Market
status	0..1	String	inherited from: Market
timeIntervalLength	0..1	Float	inherited from: Market
tradingDay	0..1	DateTime	inherited from: Market
tradingPeriod	0..1	String	inherited from: Market
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 91 shows all association ends of CRRMarket with other classes.

Table 91 – Association ends of MarketPlan::CRRMarket with other classes

mult from	name	mult to	type	description
1..1	CongestionRevenueRight	1..*	CongestionRevenueRight	
0..1	MarketFactors	0..*	MarketFactors	inherited from: Market
0..1	MarketProducts	1..*	MarketProduct	inherited from: Market
1..1	MarketRun	0..*	MarketRun	inherited from: Market
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.4.4 DistributedResourceActualEvent

A demand response event is created when there is a need to call upon resources to respond to demand adjustment requests. These events are created by ISO/RTO system operations and managed by a demand response management system (DRMS). These events may or may not be coordinated with the Market Events and a defined Energy Market. The event will call for the deployment of a number of registered resources, or for deployment of resources within a zone (an organizational area within the power system that contains a number of resources).

Table 92 shows all attributes of DistributedResourceActualEvent.

Table 92 – Attributes of MarketPlan::DistributedResourceActualEvent

name	mult	type	description
totalPowerAdjustment	0..1	ActivePower	Total active power adjustment (e.g. load reduction) requested for this demand response event.
eventComments	1..1	String	inherited from: MarketActualEvent
eventEndTime	0..1	DateTime	inherited from: MarketActualEvent
eventStartTime	0..1	DateTime	inherited from: MarketActualEvent
eventStatus	1..1	MarketEventStatusKind	inherited from: MarketActualEvent
eventType	1..1	String	inherited from: MarketActualEvent
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 93 shows all association ends of DistributedResourceActualEvent with other classes.

Table 93 – Association ends of MarketPlan::DistributedResourceActualEvent with other classes

mult from	name	mult to	type	description
0..1	InstructionClearing	0..*	InstructionClearing	ActualDemandResponseEvents may exist that are not part of a coordinated MarketActualEvent associated to a Market. These ActualDemandResponseEvents can have many InstructionClearing Instructions for specified RegisteredResources or DemandResponse AggregateNodes.
1..1	ResourcePerformanceEvaluations	0..*	ResourcePerformanceEvaluation	
0..1	InstructionClearingDOT	0..*	InstructionClearingDOT	
1..*	MarketRun	0..1	MarketRun	inherited from: MarketActualEvent
1..*	PlannedMarketEvent	0..1	PlannedMarketEvent	inherited from: MarketActualEvent
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.4.5 EnergyMarket

Energy and Ancillary Market (e.g. Energy, Spinning Reserve, Non-Spinning Reserve) with a description of the Market operation control parameters.

Table 94 shows all attributes of EnergyMarket.

Table 94 – Attributes of MarketPlan::EnergyMarket

name	mult	type	description
actualEnd	0..1	DateTime	inherited from: Market
actualStart	0..1	DateTime	inherited from: Market
dst	0..1	Boolean	inherited from: Market
end	0..1	DateTime	inherited from: Market
localTimeZone	0..1	String	inherited from: Market
start	0..1	DateTime	inherited from: Market
status	0..1	String	inherited from: Market
timeIntervalLength	0..1	Float	inherited from: Market
tradingDay	0..1	DateTime	inherited from: Market
tradingPeriod	0..1	String	inherited from: Market
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 95 shows all association ends of EnergyMarket with other classes.

Table 95 – Association ends of MarketPlan::EnergyMarket with other classes

mult from	name	mult to	type	description
0..*	RegisteredResources	0..*	RegisteredResource	
0..*	RTO	0..1	RTO	
0..1	Settlements	0..*	Settlement	
1..1	MarketResults	0..1	MarketResults	
1..1	Bids	0..*	Bid	
0..1	MarketFactors	0..*	MarketFactors	inherited from: Market
0..1	MarketProducts	1..*	MarketProduct	inherited from: Market
1..1	MarketRun	0..*	MarketRun	inherited from: Market
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.4.6 Market

Market (e.g. Day Ahead Market, Real Time Market) with a description of the Market operation control parameters.

Table 96 shows all attributes of Market.

Table 96 – Attributes of MarketPlan::Market

name	mult	type	description
actualEnd	0..1	DateTime	Market ending time – actual market end
actualStart	0..1	DateTime	Market starting time – actual market start
dst	0..1	Boolean	True if daylight savings time (DST) is in effect.
end	0..1	DateTime	Market end time.
localTimeZone	0..1	String	Local time zone.
start	0..1	DateTime	Market start time.
status	0..1	String	Market Status 'OPEN', 'CLOSED', 'CLEARED', 'BLOCKED'
timeIntervalLength	0..1	Float	Trading time interval length.
tradingDay	0..1	DateTime	Market trading date
tradingPeriod	0..1	String	Trading period that describes the market, possibilities could be for an Energy Market: Day Hour For a CRR Market: Year Month Season
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 97 shows all association ends of Market with other classes.

Table 97 – Association ends of MarketPlan::Market with other classes

mult from	name	mult to	type	description
0..1	MarketFactors	0..*	MarketFactors	
0..1	MarketProducts	1..*	MarketProduct	
1..1	MarketRun	0..*	MarketRun	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.4.7 MarketActualEvent

This class represents the actual instance of an event.

Table 98 shows all attributes of MarketActualEvent.

Table 98 – Attributes of MarketPlan::MarketActualEvent

name	mult	type	description
eventComments	1..1	String	Free format comments for the event, for any purpose needed.
eventEndTime	0..1	DateTime	End time of the event.
eventStartTime	0..1	DateTime	Start time of the event.
eventStatus	1..1	MarketEventStatusKind	Event status, e.g. active, canceled, expired, etc.
eventType	1..1	String	Actual event type.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 99 shows all association ends of MarketActualEvent with other classes.

Table 99 – Association ends of MarketPlan::MarketActualEvent with other classes

mult from	name	mult to	type	description
1..*	MarketRun	0..1	MarketRun	Market run triggered by this actual event. For example, the DA market run is triggered by the actual open bid submission event and terminated by the actual execution and completion of the DA market run captured by the runState of the MarketRun.
1..*	PlannedMarketEvent	0..1	PlannedMarketEvent	Planned event executed by this actual event.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.4.8 MarketFactors

Aggregation of market information relative for a specific time interval.

Table 100 shows all attributes of MarketFactors.

Table 100 – Attributes of MarketPlan::MarketFactors

name	mult	type	description
intervalEndTime	0..1	DateTime	The end of the time interval for which requirement is defined.
intervalStartTime	0..1	DateTime	The start of the time interval for which requirement is defined.
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 101 shows all association ends of MarketFactors with other classes.

Table 101 – Association ends of MarketPlan::MarketFactors with other classes

mult from	name	mult to	type	description
0..*	MktActivityRecord	0..*	MktActivityRecord	
0..*	Market	0..1	Market	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.4.9 MarketPlan

This class identifies a set of planned markets.

Table 102 shows all attributes of MarketPlan.

Table 102 – Attributes of MarketPlan::MarketPlan

name	mult	type	description
tradingDay	0..1	DateTime	Planned market trading day.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 103 shows all association ends of MarketPlan with other classes.

Table 103 – Association ends of MarketPlan::MarketPlan with other classes

mult from	name	mult to	type	description
1..1	PlannedMarket	1..*	PlannedMarket	A market plan has a number of markets (DA, HA, RT).
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.4.10 MarketProduct

A product traded by an RTO (e.g. energy, 10 minute spinning reserve). Ancillary service product examples include: Regulation, Regulation Up, Regulation Down, Spinning Reserve, Non-Spinning Reserve, etc.

Table 104 shows all attributes of MarketProduct.

Table 104 – Attributes of MarketPlan::MarketProduct

name	mult	type	description
marketProductType	0..1	MarketProductType	Market product type examples: EN (Energy) RU (Regulation Up) RD (Regulation Dn) SR (Spinning Reserve) NR (Non-Spinning Reserve) RC (RUC)
rampInterval	0..1	Float	Ramping time interval for the specific market product type specified by marketProductType attribute. For example, if marketProductType = EN (from enumeration MarketProductType), then the rampInterval is the ramping time interval for Energy.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 105 shows all association ends of MarketProduct with other classes.

Table 105 – Association ends of MarketPlan::MarketProduct with other classes

mult from	name	mult to	type	description
1..*	Market	0..1	Market	
1..1	ProductBids	0..*	ProductBid	
1..1	ResourceAwardInstruction	0..*	ResourceAwardInstruction	
0..1	BidError	0..*	BidError	
0..1	BidPriceCap	0..*	BidPriceCap	
0..1	MarketRegionResults	0..1	MarketRegionResults	
1..1	CommodityDefinition	0..*	CommodityDefinition	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.4.11 MarketRun

This class represents an actual instance of a planned market. For example, a Day Ahead market opens with the Bid Submission, ends with the closing of the Bid Submission. The market run represent the whole process. MarketRuns can be defined for markets such as Day Ahead Market, Real Time Market, Hour Ahead Market, Week Ahead Market, etc.

Table 106 shows all attributes of MarketRun.

Table 106 – Attributes of MarketPlan::MarketRun

name	mult	type	description
executionType	0..1	ExecutionType	The execution type; Day Ahead, Intra Day, Real Time Pre-Dispatch, Real Time Dispatch
marketApprovalTime	0..1	DateTime	Approved time for case. Identifies the time that the dispatcher approved a specific real time unit dispatch case
marketApprovedStatus	0..1	Boolean	Set to true when the plan is approved by authority and becomes the official plan for the day ahead market. Identifies the approved case for the market for the specified time interval.
marketEndTime	0..1	DateTime	The end time defined as the end of the market, market end time.
marketStartTime	0..1	DateTime	The start time defined as the beginning of the market, market start time.
marketType	0..1	MarketType	The market type, Day Ahead Market or Real Time Market.
reportedState	0..1	String	This is the state of market run activity as reported by market systems to the market definition services.
runState	0..1	String	This is the state controlled by market definition service. Possible values could be but not limited by: Open, Close.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 107 shows all association ends of MarketRun with other classes.

Table 107 – Association ends of MarketPlan::MarketRun with other classes

mult from	name	mult to	type	description
0..*	Market	1..1	Market	
0..1	MarketActualEvent	1..*	MarketActualEvent	All actual events that trigger this market run.
0..*	PlannedMarket	1..1	PlannedMarket	A planned market could have multiple market runs for the reason that a planned market could have a rerun.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.4.12 PlannedMarket root class

Represent a planned market. For example a planned DA/HA/RT market.

Table 108 shows all attributes of PlannedMarket.

Table 108 – Attributes of MarketPlan::PlannedMarket

name	mult	type	description
marketEndTime	0..1	DateTime	Market end time.
marketStartTime	0..1	DateTime	Market start time.
marketType	0..1	MarketType	Market type.

Table 109 shows all association ends of PlannedMarket with other classes.

Table 109 – Association ends of MarketPlan::PlannedMarket with other classes

mult from	name	mult to	type	description
1..1	MarketRun	0..*	MarketRun	A planned market could have multiple market runs for the reason that a planned market could have a rerun.
0..*	PlannedMarketEvent	1..*	PlannedMarketEvent	A planned market shall have a set of planned events
1..*	MarketPlan	1..1	MarketPlan	A market plan has a number of markets (DA, HA, RT).

6.5.4.13 PlannedMarketEvent

This class represents planned events. Used to model the various planned events in a market (closing time, clearing time, etc.)

Table 110 shows all attributes of PlannedMarketEvent.

Table 110 – Attributes of MarketPlan::PlannedMarketEvent

name	mult	type	description
eventType	0..1	String	Planned event type.
plannedTime	0..1	Integer	This is relative time so that this attribute can be used by more than one planned market. For example the bid submission is 10am everyday.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 111 shows all association ends of PlannedMarketEvent with other classes.

Table 111 – Association ends of MarketPlan::PlannedMarketEvent with other classes

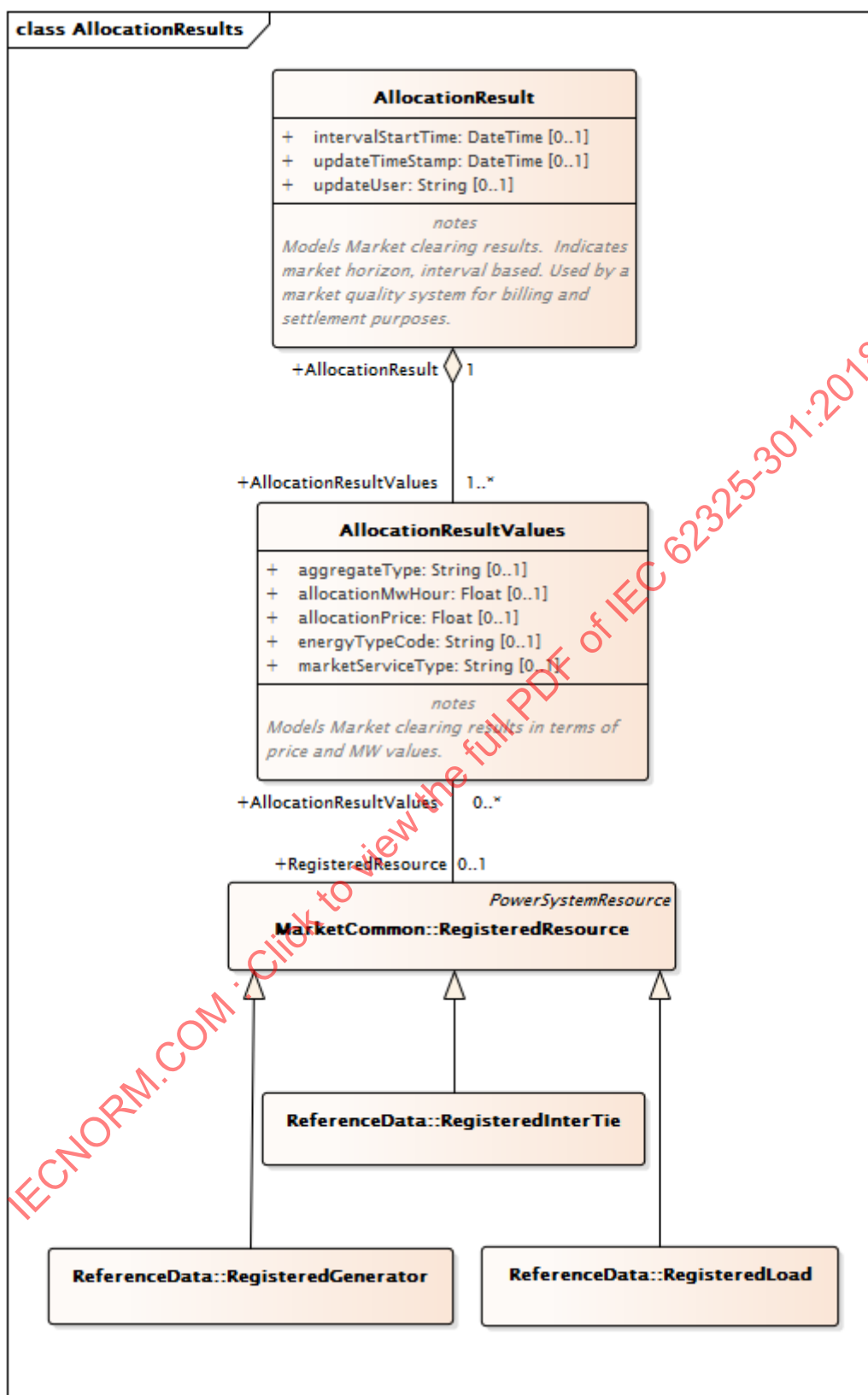
mult from	name	mult to	type	description
0..1	MarketActualEvent	1..*	MarketActualEvent	All actual events that execute this planned event.
1..*	PlannedMarket	0..*	PlannedMarket	A planned market shall have a set of planned events
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.5 Package MarketQualitySystem

6.5.5.1 General

Post-market accounting, calculation and meter data corrections to reduce invoicing errors and disputes. Reduces manual validation, verification and correction of transactional data that could affect market settlements. Republishing of market results with affected data corrected.

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Figure 36 – Class diagram MarketQualitySystem::AllocationResults

Figure 36: Shows the major classes associated with the Market Quality Systems (MQS) which is typically used to perform analysis prior to Billing and Settlement. It describes the results that are sent to the MQS. Major classes include AllocationResult which define the market horizon. The allocated results are described in the classes AllocationResultsValues and RegisteredResource class and subclasses for Generators, Interties, and Loads.

6.5.5.2 AllocationResult root class

Models Market clearing results. Indicates market horizon, interval based. Used by a market quality system for billing and settlement purposes.

Table 112 shows all attributes of AllocationResult.

Table 112 – Attributes of MarketQualitySystem::AllocationResult

name	mult	type	description
intervalStartTime	0..1	DateTime	
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	

Table 113 shows all association ends of AllocationResult with other classes.

Table 113 – Association ends of MarketQualitySystem::AllocationResult with other classes

mult from	name	mult to	type	description
1..1	AllocationResultValues	1..*	AllocationResultValues	

6.5.5.3 AllocationResultValues root class

Models Market clearing results in terms of price and MW values.

Table 114 shows all attributes of AllocationResultValues.

Table 114 – Attributes of MarketQualitySystem::AllocationResultValues

name	mult	type	description
aggregateType	0..1	String	"1" -- "Detail", "2" -- "Aggregate by Market service type", in which case, the "AllocationEnergyType" field will not be filled; "3" -- "Aggregate by "AllocationEnergyType", in which case "MarketServiceType" will not be filled.
allocationMwHour	0..1	Float	
allocationPrice	0..1	Float	
energyTypeCode	0..1	String	
marketServiceType	0..1	String	Choices are: ME – Market Energy Capacity; SR – Spinning Reserve Capacity; NR – Non-Spinning Reserve Capacity; DAC – Day Ahead Capacity; DEC – Derate Capacity

Table 115 shows all association ends of AllocationResultValues with other classes.

Table 115 – Association ends of MarketQualitySystem::AllocationResultValues with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	AllocationResult	1..1	AllocationResult	

6.5.5.4 AuxiliaryCost root class

Models Market clearing results for Auxiliary costs.

Table 116 shows all attributes of AuxiliaryCost.

Table 116 – Attributes of MarketQualitySystem::AuxiliaryCost

name	mult	type	description
intervalStartTime	0..1	DateTime	
marketType	0..1	MarketType	
updateTimeStamp	0..1	DateTime	
updateUser	0..1	String	

Table 117 shows all association ends of AuxiliaryCost with other classes.

Table 117 – Association ends of MarketQualitySystem::AuxiliaryCost with other classes

mult from	name	mult to	type	description
1..1	AuxiliaryValues	1..*	AuxiliaryValues	

6.5.5.5 AuxiliaryObject root class

Models Auxiliary Values.

Table 118 shows all association ends of AuxiliaryObject with other classes.

Table 118 – Association ends of MarketQualitySystem::AuxiliaryObject with other classes

mult from	name	mult to	type	description
0..*	RegisteredLoad	0..1	RegisteredLoad	
0..*	RegisteredGenerator	0..1	RegisteredGenerator	

6.5.5.6 AuxiliaryValues

Models Auxiliary Values.

Table 119 shows all attributes of AuxiliaryValues.

Table 119 – Attributes of MarketQualitySystem::AuxiliaryValues

name	mult	type	description
minExpostCapacity	0..1	Float	
maxExpostCapacity	0..1	Float	
availUndispatchedQ	0..1	Float	
incrementalIORAvail	0..1	Float	
startUpCost	0..1	Float	
startUpCostEligibilityFlag	0..1	YesNo	
noLoadCost	0..1	Float	
noLoadCostEligibilityFlag	0..1	YesNo	

Table 120 shows all association ends of AuxiliaryValues with other classes.

Table 120 – Association ends of MarketQualitySystem::AuxiliaryValues with other classes

mult from	name	mult to	type	description
1..*	AuxiliaryCost	1..1	AuxiliaryCost	
1..*	TenMinAuxiliaryData	1..1	TenMinAuxiliaryData	
1..*	FiveMinAuxiliaryData	1..1	FiveMinAuxiliaryData	
0..*	RegisteredLoad	0..1	RegisteredLoad	inherited from: AuxiliaryObject
0..*	RegisteredGenerator	0..1	RegisteredGenerator	inherited from: AuxiliaryObject

6.5.5.7 ExpectedEnergy root class

Model Expected Energy from Market Clearing, interval based.

Table 121 shows all attributes of ExpectedEnergy.

Table 121 – Attributes of MarketQualitySystem::ExpectedEnergy

name	mult	type	description
intervalStartTime	0..1	DateTime	
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	

Table 122 shows all association ends of ExpectedEnergy with other classes.

Table 122 – Association ends of MarketQualitySystem::ExpectedEnergy with other classes

mult from	name	mult to	type	description
1..1	ExpectedEnergyValues	1..*	ExpectedEnergyValues	

6.5.5.8 ExpectedEnergyValues root class

Model Expected Energy from Market Clearing.

Table 123 shows all attributes of ExpectedEnergyValues.

Table 123 – Attributes of MarketQualitySystem::ExpectedEnergyValues

name	mult	type	description
energyTypeCode	0..1	String	
expectedMwh	0..1	Float	

Table 124 shows all association ends of ExpectedEnergyValues with other classes.

Table 124 – Association ends of MarketQualitySystem::ExpectedEnergyValues with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	ExpectedEnergy	1..1	ExpectedEnergy	

6.5.5.9 FiveMinAuxiliaryData root class

Models 5-Minutes Auxiliary Data.

Table 125 shows all attributes of FiveMinAuxiliaryData.

Table 125 – Attributes of MarketQualitySystem::FiveMinAuxiliaryData

name	mult	type	description
intervalStartTime	0..1	DateTime	
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	

Table 126 shows all association ends of FiveMinAuxiliaryData with other classes.

Table 126 – Association ends of MarketQualitySystem::FiveMinAuxiliaryData with other classes

mult from	name	mult to	type	description
1..1	AuxiliaryValues	1..*	AuxiliaryValues	

6.5.5.10 TenMinAuxiliaryData root class

Models 10-Minutes Auxiliary Data.

Table 127 shows all attributes of TenMinAuxiliaryData.

Table 127 – Attributes of MarketQualitySystem::TenMinAuxiliaryData

name	mult	type	description
intervalStartTime	0..1	DateTime	
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	

Table 128 shows all association ends of TenMinAuxiliaryData with other classes.

Table 128 – Association ends of MarketQualitySystem::TenMinAuxiliaryData with other classes

mult from	name	mult to	type	description
1..1	AuxiliaryData	1..*	AuxiliaryValues	

6.5.5.11 TradingHubPrice root class

Models prices at Trading Hubs, interval based.

Table 129 shows all attributes of TradingHubPrice.

Table 129 – Attributes of MarketQualitySystem::TradingHubPrice

name	mult	type	description
intervalStartTime	0..1	DateTime	
marketType	0..1	MarketType	
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	

Table 130 shows all association ends of TradingHubPrice with other classes.

Table 130 – Association ends of MarketQualitySystem::TradingHubPrice with other classes

mult from	name	mult to	type	description
1..1	TradingHubValues	1..*	TradingHubValues	

6.5.5.12 TradingHubValues root class

Models prices at Trading Hubs.

Table 131 shows all attributes of TradingHubValues.

Table 131 – Attributes of MarketQualitySystem::TradingHubValues

name	mult	type	description
price	0..1	Float	Utilizes the Market type. For DA, the price is hourly. For RTM the price is a 5 minute price.

Table 132 shows all association ends of TradingHubValues with other classes.

**Table 132 – Association ends of MarketQualitySystem::
TradingHubValues with other classes**

mult from	name	mult to	type	description
0..*	AggregatedPnode	1..1	AggregatedPnode	
1..*	TradingHubPrice	1..1	TradingHubPrice	

6.5.6 Package MarketSystem

6.5.6.1 General

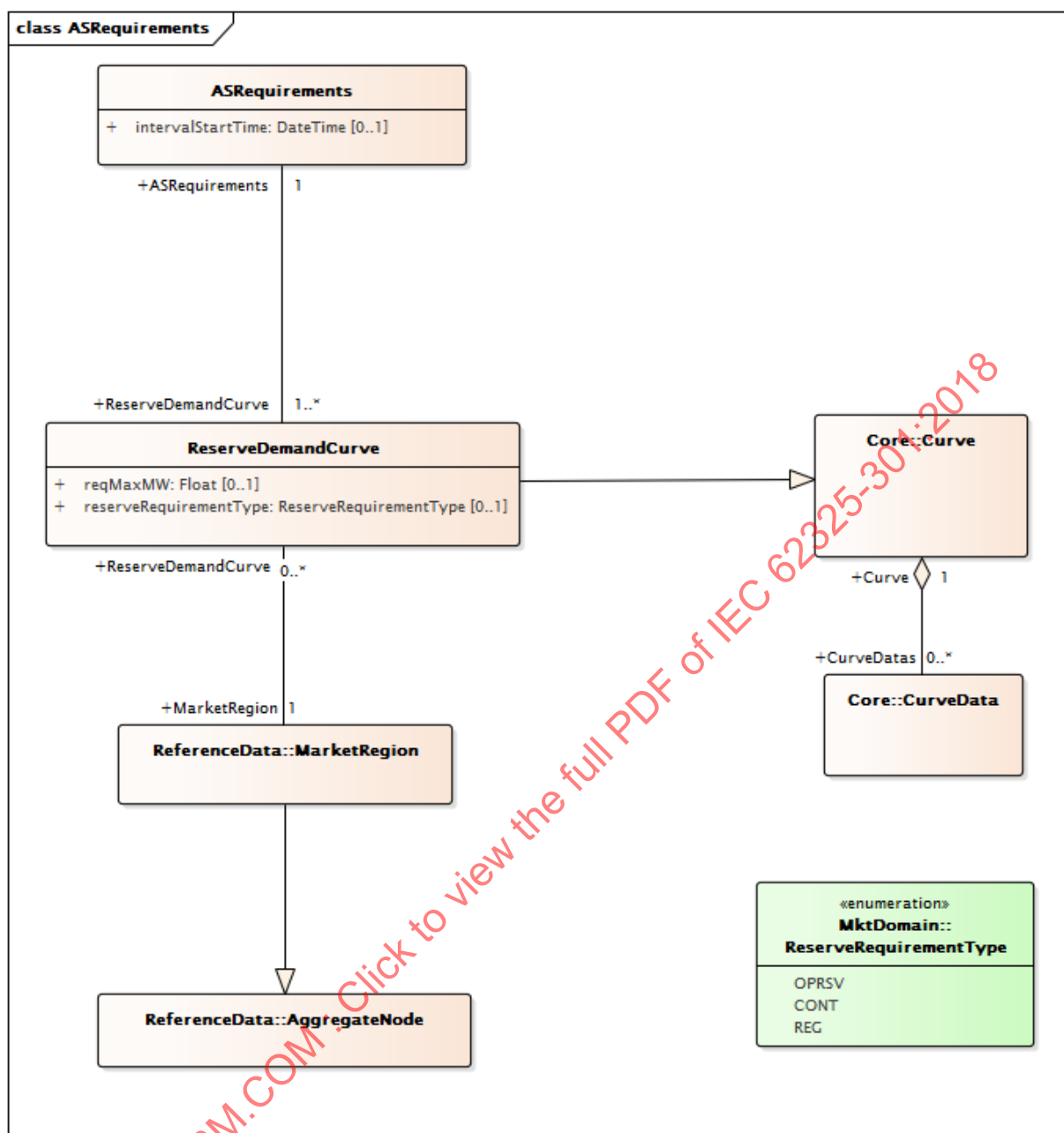
Market results and external inputs consumed by markets.

6.5.6.2 Package ExternalInputs

6.5.6.2.1 General

Inputs to the market system from external sources.

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Figure 37 – Class diagram ExternalInputs::ASRequirements

Figure 37: Models Ancillary Service requirements. The class ASRequirements is used to describe the interval for which the Ancillary Service is required. The ASRequirement class is used to describe the quantities of required ancillary services. The association to MarketRegion models the regional requirements of ancillary services. The class MarketProduct is used to describe the particular class of ancillary service.

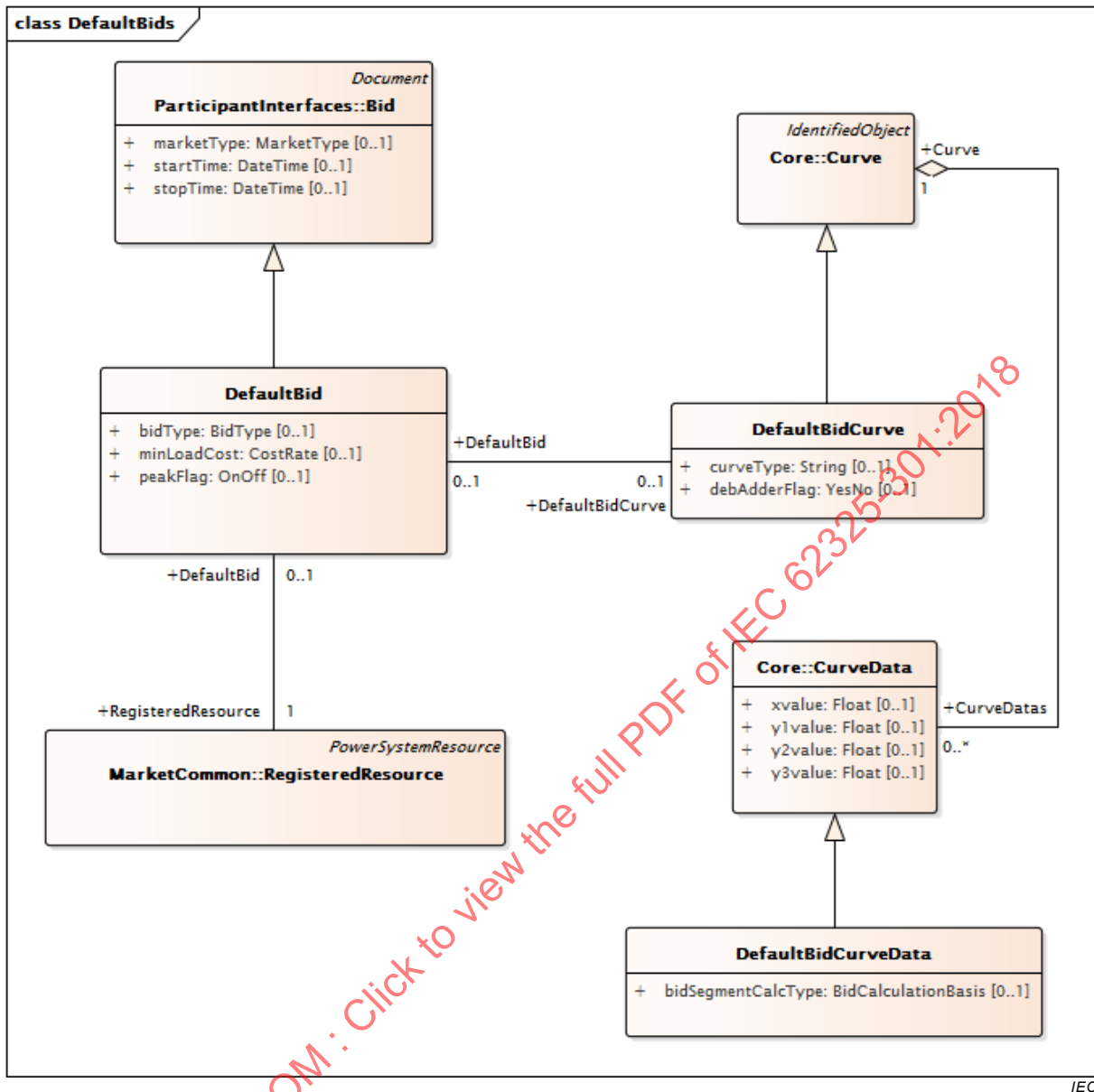


Figure 38 – Class diagram ExternalInputs::DefaultBids

Figure 38: Shows the classes used to model a default bid. Market Power Mitigation is a process that detects an attempt on the part of a market participant to exercise market power. Detection is followed by remediation. Remediation consist of substitution of a default bid for the original bid. The classes include a Curve and Curve Data classes (from the IEC 61970 core package), as well as the generic class DefaultBid which may be used to further describe the market specific remediation methods. Three typical methods are used: LMP, cost based on gas index, or out-of-market negotiation.

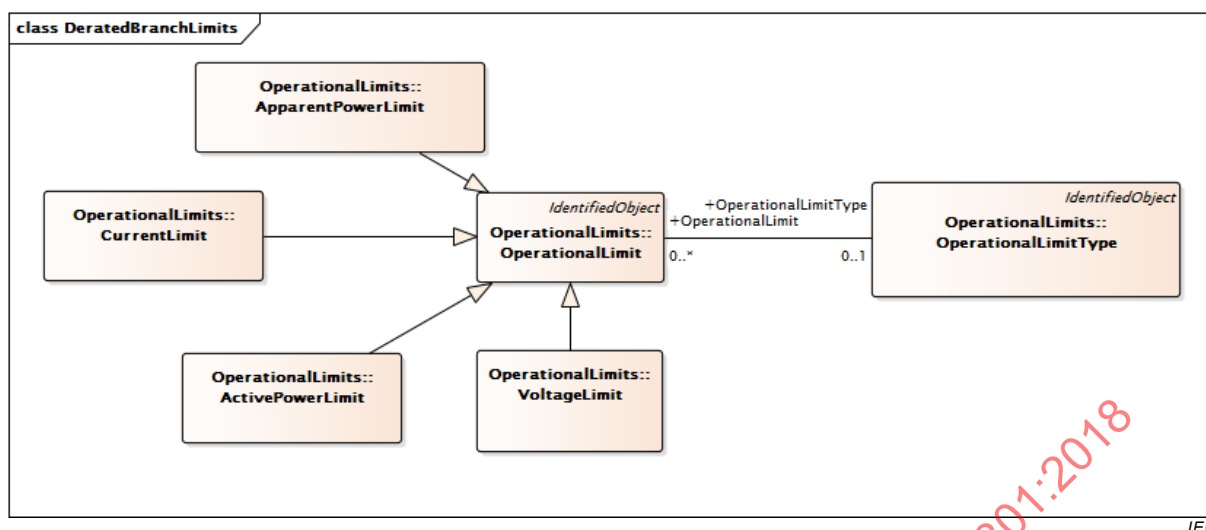
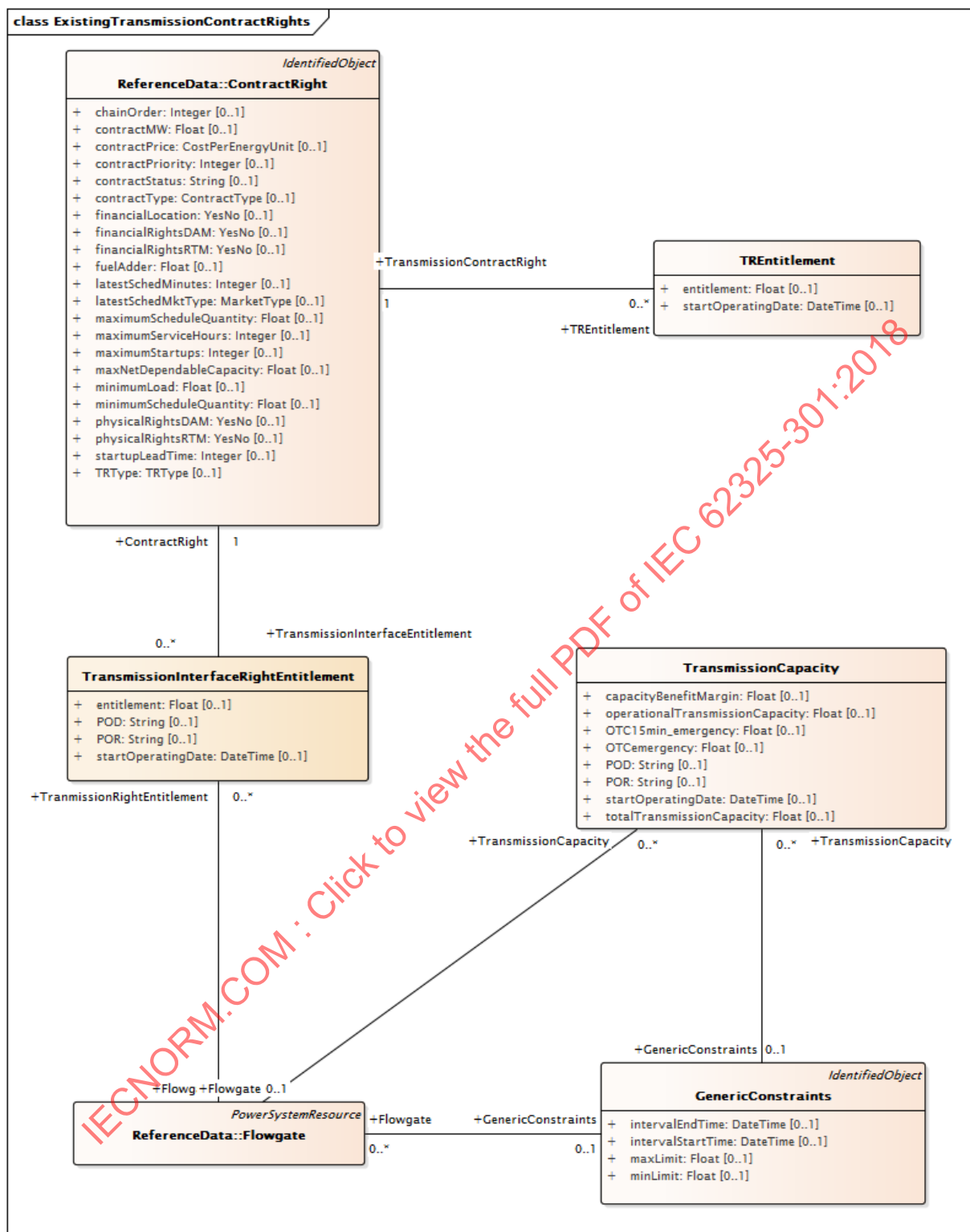


Figure 39 – Class diagram ExternalInputs::DeratedBranchLimits

Figure 39: Shows the major classes used to model operational limits. The classes are reused from the IEC 61970 OperationalLimits package and include Active Power, Voltage, and Current Limits.



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Figure 40 – Class diagram ExternalInputs::ExistingTransmissionContractRights

Figure 40: Shows the major classes used to model these legacy rights. During the startup and evolution of LMP markets, the need arose to accommodate existing transmission rights in the market solution. The ContractRight class includes information describing the specific rights that are contracted in terms of active power and other contract details. The TransmissionInterfaceRightEntitlement class describes the physical aspects of the right in associated point of delivery and point of receipt of active power.

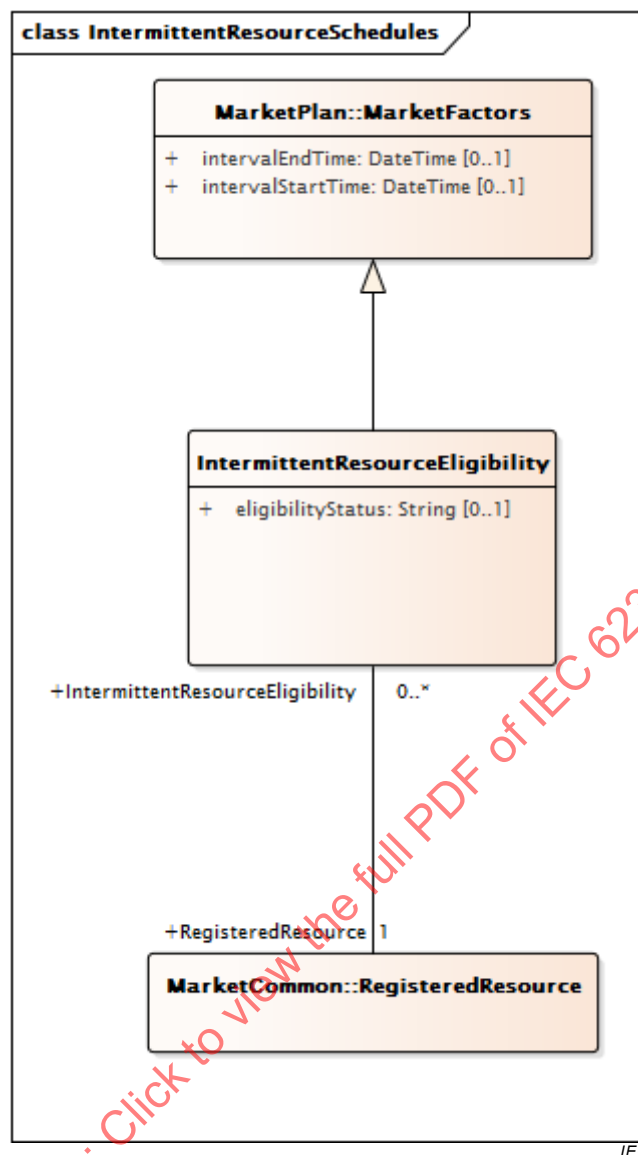


Figure 41 – Class diagram ExternalInputs::IntermittentResourceSchedules

Figure 41: Shows the major classes used to model intermittent (variable) resources. It is typically used to model renewables such as wind power. The **IntermittentResourceEligibility** class is used to indicate whether the resource is eligible to participate as a renewable resource governed by a generic renewable resource regime.

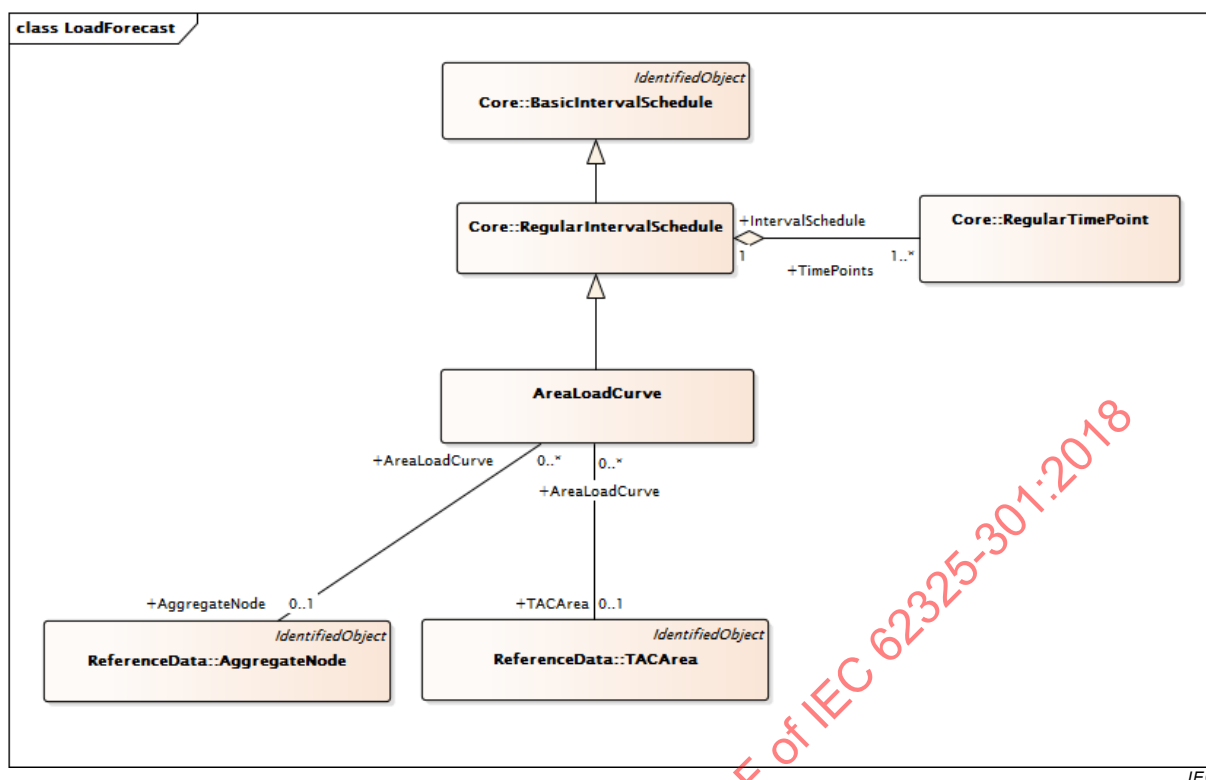


Figure 42 – Class diagram ExternalInputs::LoadForecast

Figure 42: Shows the classes used to model the load forecast over the market time horizon. The model reused classes from the IEC 61970 Core package and adds specific models for markets.

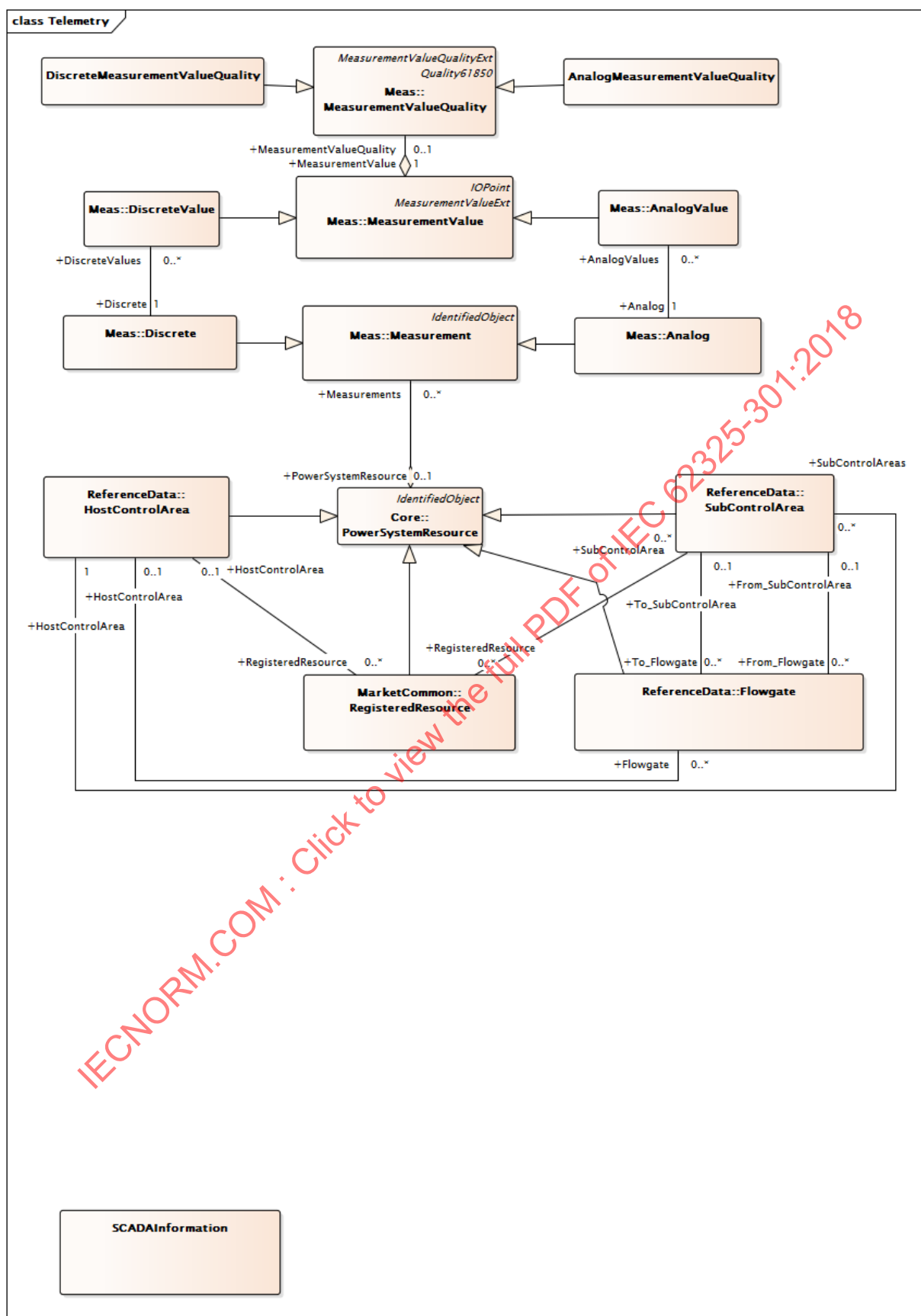


Figure 43 – Class diagram ExternalInputs::Telemetry

Figure 43: Shows the classes used to model telemetry that may be used (in the event of failure or non-availability of a state estimator solution) to initialize a real time market run. The

figure shows classes from the IEC 61970 package and additional market specific RegisteredResource and Flowgate classes and their relationships to the classes from the IEC 61970 packages.

6.5.6.2.2 ASRequirements root class

Models Ancillary Service Requirements. Describes interval for which the requirement is applicable.

Table 133 shows all attributes of ASRequirements.

Table 133 – Attributes of ExternalInputs::ASRequirements

name	mult	type	description
intervalStartTime	0..1	DateTime	The start of the time interval for which requirement is defined.

Table 134 shows all association ends of ASRequirements with other classes.

Table 134 – Association ends of ExternalInputs::ASRequirements with other classes

mult from	name	mult to	type	description
1..1	ReserveDemandCurve	1..*	ReserveDemandCurve	

6.5.6.2.3 AnalogMeasurementValueQuality

Measurement quality flags for Analog Values.

Table 135 shows all attributes of AnalogMeasurementValueQuality.

Table 135 – Attributes of ExternalInputs::AnalogMeasurementValueQuality

name	mult	type	description
scadaQualityCode	0..1	String	The quality code for the given Analog Value.
badReference	0..1	Boolean	inherited from: Quality61850
estimatorReplaced	0..1	Boolean	inherited from: Quality61850
failure	0..1	Boolean	inherited from: Quality61850
oldData	0..1	Boolean	inherited from: Quality61850
operatorBlocked	0..1	Boolean	inherited from: Quality61850
oscillatory	0..1	Boolean	inherited from: Quality61850
outOfRange	0..1	Boolean	inherited from: Quality61850
overflow	0..1	Boolean	inherited from: Quality61850
source	0..1	Source	inherited from: Quality61850
suspect	0..1	Boolean	inherited from: Quality61850
test	0..1	Boolean	inherited from: Quality61850
validity	0..1	Validity	inherited from: Quality61850

Table 136 shows all association ends of AnalogMeasurementValueQuality with other classes.

Table 136 – Association ends of ExternalInputs::AnalogMeasurementValueQuality with other classes

mult from	name	mult to	type	description
0..1	MeasurementValue	1..1	MeasurementValue	inherited from: MeasurementValueQuality

6.5.6.2.4 AreaLoadCurve

Area load curve definition.

Table 137 shows all attributes of AreaLoadCurve.

Table 137 – Attributes of ExternalInputs::AreaLoadCurve

name	mult	type	description
forecastType	0..1	LoadForecastType	Load forecast area type.
endTime	0..1	DateTime	inherited from: RegularIntervalSchedule
timeStep	0..1	Seconds	inherited from: RegularIntervalSchedule
startTime	0..1	DateTime	inherited from: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value1Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value2Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 138 shows all association ends of AreaLoadCurve with other classes.

Table 138 – Association ends of ExternalInputs::AreaLoadCurve with other classes

mult from	name	mult to	type	description
0..*	AggregateNode	0..1	AggregateNode	
0..*	TACArea	0..1	TACArea	
1..1	TimePoints	1..*	RegularTimePoint	inherited from: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.5 BaseCaseConstraintLimit

Possibly time-varying max MW or MVA and optionally Min MW limit or MVA limit (Y1 and Y2, respectively) assigned to a contingency analysis base case. Use CurveSchedule XAxisUnits

to specify MW or MVA. To be used only if the BaseCaseConstraintLimit differs from the DefaultConstraintLimit.

Table 139 shows all attributes of BaseCaseConstraintLimit.

Table 139 – Attributes of ExternalInputs::BaseCaseConstraintLimit

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 140 shows all association ends of BaseCaseConstraintLimit with other classes.

Table 140 – Association ends of ExternalInputs::BaseCaseConstraintLimit with other classes

mult from	name	mult to	type	description
0..1	SecurityConstraintSum	1..1	SecurityConstraintSum	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.6 BranchEndFlow root class

Dynamic flows and ratings associated with a branch end.

Table 141 shows all attributes of BranchEndFlow.

Table 141 – Attributes of ExternalInputs::BranchEndFlow

name	mult	type	description
mwFlow	0..1	Float	The MW flow on the branch Attribute Usage: Active power flow at the series device, transformer, phase shifter, or line end
mVARFlow	0..1	Float	The MVAR flow on the branch Attribute Usage: Reactive power flow at the series device, transformer, phase shifter, or line end
normalRating	0..1	Float	The Normal Rating for the branch
longTermRating	0..1	Float	The Long Term Rating for the branch
shortTermRating	0..1	Float	The Short Term Rating for the branch
loadDumpRating	0..1	Float	The Load Dump Rating for the branch

Table 142 shows all association ends of BranchEndFlow with other classes.

Table 142 – Association ends of ExternalInputs::BranchEndFlow with other classes

mult from	name	mult to	type	description
0..1	MktPowerTransformerEndBFlow	0..*	MktPowerTransformer	
0..1	MktPowerTransformerEndAFlow	0..*	MktPowerTransformer	
0..1	MktACLineSegmentEndAFlow	0..*	MktACLineSegment	
0..1	MktACLineSegmentEndBFlow	0..*	MktACLineSegment	
0..1	MktSeriesCompensatorEndBFlow	0..*	MktSeriesCompensator	
0..1	MktSeriesCompensatorEndAFlow	0..*	MktSeriesCompensator	

6.5.6.2.7 ConstraintTerm

A constraint term is one element of a linear constraint.

Table 143 shows all attributes of ConstraintTerm.

Table 143 – Attributes of ExternalInputs::ConstraintTerm

name	mult	type	description
factor	0..1	String	
function	0..1	String	The function is an enumerated value that can be 'active', 'reactive', or 'VA' to indicate the type of flow.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 144 shows all association ends of ConstraintTerm with other classes.

Table 144 – Association ends of ExternalInputs::ConstraintTerm with other classes

mult from	name	mult to	type	description
0..*	SecurityConstraintSum	1..1	SecurityConstraintSum	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.8 ContingencyConstraintLimit

Possibly time-varying max MW or MVA and optionally Min MW limit or MVA limit (Y1 and Y2, respectively) assigned to a constraint for a specific contingency. Use CurveSchedule XAxisUnits to specify MW or MVA.

Table 145 shows all attributes of ContingencyConstraintLimit.

Table 145 – Attributes of ExternalInputs::ContingencyConstraintLimit

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 146 shows all association ends of ContingencyConstraintLimit with other classes.

Table 146 – Association ends of ExternalInputs::ContingencyConstraintLimit with other classes

mult from	name	mult to	type	description
0..*	MktContingency	1..1	MktContingency	
1..1	MWLimitSchedules	1..1	MWLimitSchedule	
0..*	SecurityConstraintSum	1..1	SecurityConstraintSum	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.9 ControlAreaSolutionData root class

State Estimator Solution Pool Interchange and Losses.

Table 147 shows all attributes of ControlAreaSolutionData.

Table 147 – Attributes of ExternalInputs::ControlAreaSolutionData

name	mult	type	description
solvedLosses	0..1	Float	Pool Losses MW Attribute Usage: The active power losses of the pool in MW
solvedInterchange	0..1	Float	Pool MW Interchange Attribute Usage: The active power interchange of the pool

Table 148 shows all association ends of ControlAreaSolutionData with other classes.

Table 148 – Association ends of ExternalInputs::ControlAreaSolutionData with other classes

mult from	name	mult to	type	description
0..*	MktControlArea	0..1	MktControlArea	

6.5.6.2.10 DefaultBid

DefaultBid is a generic class to hold Default Energy Bid, Default Startup Bid, and Default Minimum Load Bid:

Default Energy Bid

A Default Energy Bid is a monotonically increasing staircase function consisting at maximum 10 economic bid segments, or 10 (\$/MW, MW) pairs. There are three methods for determining the Default Energy Bid:

- Cost Based: derived from the Heat Rate or Average Cost multiplied by the Gas Price Index plus 10%.

- LMP Based: a weighted average of LMPs in the preceding 90 days.
- Negotiated: an amount negotiated with the designated Independent Entity.

Default Startup Bid

A Default Startup Bid (DSUB) shall be calculated for each RMR unit based on the Startup Cost stored in the Master File and the applicable GPI and EPI.

Default Minimum Load Bid

A Default Minimum Load Bid (DMLB) shall be calculated for each RMR unit based on the Minimum Load Cost stored in the Master File and the applicable GPI.

Table 149 shows all attributes of DefaultBid.

Table 149 – Attributes of ExternalInputs::DefaultBid

name	mult	type	description
bidType	0..1	BidType	Default bid type such as Default Energy Bid, Default Minimum Load Bid, and Default Startup Bid
minLoadCost	0..1	CostRate	Minimum load cost in \$/hr
peakFlag	0..1	OnOff	on-peak, off-peak, or all
startTime	0..1	DateTime	inherited from: Bid
stopTime	0..1	DateTime	inherited from: Bid
marketType	0..1	MarketType	inherited from: Bid
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 150 shows all association ends of DefaultBid with other classes.

Table 150 – Association ends of ExternalInputs::DefaultBid with other classes

mult from	name	mult to	type	description
0..1	RegisteredResource	1..1	RegisteredResource	
0..1	DefaultBidCurve	0..1	DefaultBidCurve	
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: Bid
0..*	EnergyMarket	1..1	EnergyMarket	inherited from: Bid
0..1	ChargeProfiles	0..*	ChargeProfile	inherited from: Bid
1..1	MitigatedBidSegment	0..*	MitigatedBidSegment	inherited from: Bid
0..1	MitigatedBid	0..*	MitigatedBid	inherited from: Bid
0..1	RMRDetermination	0..*	RMRDetermination	inherited from: Bid
0..*	ActionRequest	1..1	ActionRequest	inherited from: Bid
1..1	BidHourlySchedule	0..*	BidHourlySchedule	inherited from: Bid
1..1	ProductBids	1..*	ProductBid	inherited from: Bid
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.11 DefaultBidCurve

Default bid curve for default energy bid curve and default startup curves (cost and time).

Table 151 shows all attributes of DefaultBidCurve.

Table 151 – Attributes of ExternalInputs::DefaultBidCurve

name	mult	type	description
curveType	0..1	String	To indicate a type used for a default energy bid curve, such as LMP, cost or consultative based.
debAdderFlag	0..1	YesNo	Default energy bid adder flag
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 152 shows all association ends of DefaultBidCurve with other classes.

Table 152 – Association ends of ExternalInputs::DefaultBidCurve with other classes

mult from	name	mult to	type	description
0..1	DefaultBid	0..1	DefaultBid	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.12 DefaultBidCurveData

Curve data for default bid curve and startup cost curve.

Table 153 shows all attributes of DefaultBidCurveData.

Table 153 – Attributes of ExternalInputs::DefaultBidCurveData

name	mult	type	description
bidSegmentCalcType	0..1	BidCalculationBasis	Type of calculation basis used to define the default bid segment curve.
xvalue	0..1	Float	inherited from: CurveData
y1value	0..1	Float	inherited from: CurveData
y2value	0..1	Float	inherited from: CurveData
y3value	0..1	Float	inherited from: CurveData

Table 154 shows all association ends of DefaultBidCurveData with other classes.

Table 154 – Association ends of ExternalInputs::DefaultBidCurveData with other classes

mult from	name	mult to	type	description
0..*	Curve	1..1	Curve	inherited from: CurveData

6.5.6.2.13 DefaultConstraintLimit

Possibly time-varying max MW or MVA and optionally Min MW limit or MVA limit (Y1 and Y2, respectively) applied as a default value if no specific constraint limits are specified for a contingency analysis. Use CurveSchedule XAxisUnits to specify MW or MVA.

Table 155 shows all attributes of DefaultConstraintLimit.

Table 155 – Attributes of ExternalInputs::DefaultConstraintLimit

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 156 shows all association ends of DefaultConstraintLimit with other classes.

**Table 156 – Association ends of ExternalInputs::
DefaultConstraintLimit with other classes**

mult from	name	mult to	type	description
0..1	SecurityConstraintSum	1..1	SecurityConstraintSum	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.14 DiscreteMeasurementValueQuality

Measurement quality flags for Discrete Values.

Table 157 shows all attributes of DiscreteMeasurementValueQuality.

Table 157 – Attributes of ExternalInputs::DiscreteMeasurementValueQuality

name	mult	type	description
manualReplaceIndicator	0..1	Boolean	Switch Manual Replace Indicator. Flag indicating that the switch is manual replace.
removeFromOperationIndicator	0..1	Boolean	Removed From Operation Indicator. Flag indicating that the switch is removed from operation.
badReference	0..1	Boolean	inherited from: Quality61850
estimatorReplaced	0..1	Boolean	inherited from: Quality61850
failure	0..1	Boolean	inherited from: Quality61850
oldData	0..1	Boolean	inherited from: Quality61850
operatorBlocked	0..1	Boolean	inherited from: Quality61850
oscillatory	0..1	Boolean	inherited from: Quality61850
outOfRange	0..1	Boolean	inherited from: Quality61850
overFlow	0..1	Boolean	inherited from: Quality61850
source	0..1	Source	inherited from: Quality61850
suspect	0..1	Boolean	inherited from: Quality61850
test	0..1	Boolean	inherited from: Quality61850
validity	0..1	Validity	inherited from: Quality61850

Table 158 shows all association ends of DiscreteMeasurementValueQuality with other classes.

Table 158 – Association ends of ExternalInputs::DiscreteMeasurementValueQuality with other classes

mult from	name	mult to	type	description
0..1	MeasurementValue	1..1	MeasurementValue	inherited from: MeasurementValueQuality

6.5.6.2.15 DistributionFactorSet root class

A containing class that groups all the distribution factors within a market.

This is calculated daily for DA factors and hourly for RT factors.

Table 159 shows all attributes of DistributionFactorSet.

Table 159 – Attributes of ExternalInputs::DistributionFactorSet

name	mult	type	description
intervalStartTime	0..1	DateTime	The start of the time interval for which requirement is defined.
intervalEndTime	0..1	DateTime	The end of the time interval for which requirement is defined.
marketType	0..1	MarketType	Market type.

Table 160 shows all association ends of DistributionFactorSet with other classes.

Table 160 – Association ends of ExternalInputs::DistributionFactorSet with other classes

mult from	name	mult to	type	description
0..*	GenDistributionFactor	0..*	GenDistributionFactor	
0..*	SysLoadDistribuFactor	0..*	SysLoadDistributionFact or	
0..*	LoadDistributionFactor	0..*	LoadDistributionFactor	

6.5.6.2.16 EnergyPriceIndex

An Energy Price Index for each Resource is valid for a period (e.g. daily) that is identified by a Valid Period Start Time and a Valid Period End Time. An Energy Price Index is in \$/MWh.

Table 161 shows all attributes of EnergyPriceIndex.

Table 161 – Attributes of ExternalInputs::EnergyPriceIndex

name	mult	type	description
energyPriceIndex	0..1	Float	Energy price index
energyPriceIndexType	0..1	EnergyPriceIndexType	EPI type such as wholesale or retail
lastModified	0..1	DateTime	Time updated
validPeriod	0..1	DateTimeInterval	Valid period for which the energy price index is valid.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 162 shows all association ends of EnergyPriceIndex with other classes.

Table 162 – Association ends of ExternalInputs::EnergyPriceIndex with other classes

mult from	name	mult to	type	description
1..1	RegisteredGenerator	1..1	RegisteredGenerator	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.17 EnergyProfile

Specifies the start time, stop time, level for an EnergyTransaction.

Table 163 shows all attributes of EnergyProfile.

Table 163 – Attributes of ExternalInputs::EnergyProfile

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 164 shows all association ends of EnergyProfile with other classes.

Table 164 – Association ends of ExternalInputs::EnergyProfile with other classes

mult from	name	mult to	type	description
1..*	TransactionBid	1..1	TransactionBid	
1..*	EnergyTransaction	1..1	EnergyTransaction	An EnergyTransaction shall have at least one EnergyProfile.
0..*	ProfileDatas	0..*	ProfileData	inherited from: Profile
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.18 EnergyTransaction

Specifies the schedule for energy transfers between interchange areas that are necessary to satisfy the associated interchange transaction.

Table 165 shows all attributes of EnergyTransaction.

Table 165 – Attributes of ExternalInputs::EnergyTransaction

name	mult	type	description
capacityBacked	0..1	Boolean	Interchange capacity flag. When the flag is set to true, it indicates a transaction is capacity backed.
congestChargeMax	0..1	Money	Maximum congestion charges in monetary units.
deliveryPointP	0..1	ActivePower	Delivery point active power.
energyMin	0..1	ActivePower	Transaction minimum active power if dispatchable.
firmInterchangeFlag	0..1	Boolean	Firm interchange flag indicates whether or not this energy transaction can be changed without potential financial consequences.
payCongestion	0..1	Boolean	Willing to Pay congestion flag
reason	0..1	String	Reason for energy transaction.
receiptPointP	0..1	ActivePower	Receipt point active power.
state	0..1	EnergyTransactionType	{ Approve Deny Study }
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document

name	mult	type	description
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 166 shows all association ends of EnergyTransaction with other classes.

Table 166 – Association ends of ExternalInputs::EnergyTransaction with other classes

mult from	name	mult to	type	description
0..*	EnergyPriceCurves	0..*	EnergyPriceCurve	
1..1	EnergyProfiles	1..*	EnergyProfile	An EnergyTransaction shall have at least one EnergyProfile.
0..*	Export_SubControlArea	1..1	SubControlArea	Energy is transferred between interchange areas
0..*	Import_SubControlArea	1..1	SubControlArea	Energy is transferred between interchange areas
0..1	TransmissionReservation	0..1	TransmissionReservation	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.19 GenDistributionFactor root class

This class models the generation distribution factors. This class needs to be used along with the AggregatedPnode and the IndividualPnode to show the distribution of each individual party.

Table 167 shows all attributes of GenDistributionFactor.

Table 167 – Attributes of ExternalInputs::GenDistributionFactor

name	mult	type	description
factor	0..1	Float	Used to calculate generation "participation" of an individual pnode in an AggregatePnode.

Table 168 shows all association ends of GenDistributionFactor with other classes.

Table 168 – Association ends of ExternalInputs::GenDistributionFactor with other classes

mult from	name	mult to	type	description
0..*	DistributionFactorSet	0..*	DistributionFactorSet	
1..*	AggregatedPnode	0..1	AggregatedPnode	
0..1	IndividualPnode	0..1	IndividualPnode	

6.5.6.2.20 GeneratingUnitDynamicValues root class

Optimal Power Flow or State Estimator Unit Data for Operator Training Simulator. This is used for RealTime, Study and Maintenance Users.

Table 169 shows all attributes of GeneratingUnitDynamicValues.

Table 169 – Attributes of ExternalInputs::GeneratingUnitDynamicValues

name	mult	type	description
lossFactor	0..1	Float	Loss Factor
maximumMW	0..1	Float	The maximum active power generation of the unit in MW
minimumMW	0..1	Float	The minimum active power generation of the unit in MW
mVAR	0..1	Float	Unit reactive power generation in MVAR
mw	0..1	Float	Unit active power generation in MW
sensitivity	0..1	Float	Unit sensitivity factor. The distribution factors (DFAX) for the unit

Table 170 shows all association ends of GeneratingUnitDynamicValues with other classes.

Table 170 – Association ends of ExternalInputs::GeneratingUnitDynamicValues with other classes

mult from	name	mult to	type	description
0..*	MktGeneratingUnit	1..1	MktGeneratingUnit	
0..*	Flowgate	0..1	Flowgate	

6.5.6.2.21 GenericConstraints

Generic constraints can represent secure areas, voltage profile, transient stability and voltage collapse limits.

The generic constraints can be one of the following forms:

- a) Thermal MW limit constraints type
- b) Group line flow constraint type

Table 171 shows all attributes of GenericConstraints.

Table 171 – Attributes of ExternalInputs::GenericConstraints

name	mult	type	description
intervalEndTime	0..1	DateTime	Interval End Time
intervalStartTime	0..1	DateTime	Interval Start Time
maxLimit	0..1	Float	Maximum Limit (MW)
minLimit	0..1	Float	Minimum Limit (MW)
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 172 shows all association ends of GenericConstraints with other classes.

Table 172 – Association ends of ExternalInputs::GenericConstraints with other classes

mult from	name	mult to	type	description
0..1	Flowgate	0..*	Flowgate	
0..1	TransmissionCapacity	0..*	TransmissionCapacity	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.22 InterchangeETCData root class

Existing Transmission Contract data for an interchange schedule.

Table 173 shows all attributes of InterchangeETCData.

Table 173 – Attributes of ExternalInputs::InterchangeETCData

name	mult	type	description
contractNumber	0..1	String	Existing transmission contract number
usageMW	0..1	Float	Existing transmission contract usage MW value

Table 174 shows all association ends of InterchangeETCData with other classes.

Table 174 – Association ends of ExternalInputs::InterchangeETCData with other classes

mult from	name	mult to	type	description
0..*	InterchangeSchedule	0..1	InterchangeSchedule	

6.5.6.2.23 InterchangeSchedule

Interchange schedule class to hold information for interchange schedules such as import export type, energy type, and etc.

Table 175 shows all attributes of InterchangeSchedule.

Table 175 – Attributes of ExternalInputs::InterchangeSchedule

name	mult	type	description
checkOutType	0..1	CheckOutType	To indicate a check out type such as adjusted capacity or dispatch capacity.
directionType	0..1	InterTieDirection	Import or export.
energyType	0..1	MarketProductType	Energy product type.
intervalLength	0..1	Integer	Interval length.
marketType	0..1	MarketType	Market type.
operatingDate	0..1	DateTime	Operating date, hour.
outOfMarketType	0..1	Boolean	To indicate an out-of-market (OOM) schedule.
scheduleType	0..1	EnergyProductType	Schedule type.
wcrID	0..1	String	Wheeling Counter-Resource ID (required when Schedule Type=Wheel).
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 176 shows all association ends of InterchangeSchedule with other classes.

Table 176 – Association ends of ExternalInputs::InterchangeSchedule with other classes

mult from	name	mult to	type	description
0..1	InterchangeETCData	0..*	InterchangeETCData	
0..*	InterTie	0..1	SchedulingPoint	
0..*	RegisteredInterTie	0..1	RegisteredInterTie	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.24 IntermittentResourceEligibility

Indicates whether unit is eligible for treatment as a intermittent variable renewable resource.

Table 177 shows all attributes of IntermittentResourceEligibility.

Table 177 – Attributes of ExternalInputs::IntermittentResourceEligibility

name	mult	type	description
eligibilityStatus	0..1	String	Indicates whether a resource is eligible for PIRP program for a given hour
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 178 shows all association ends of IntermittentResourceEligibility with other classes.

Table 178 – Association ends of ExternalInputs:: IntermittentResourceEligibility with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	1..1	RegisteredResource	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.25 LoadDistributionFactor root class

This class models the load distribution factors. This class should be used in one of two ways:

Use it along with the AggregatedPnode and the IndividualPnode to show the distribution of each individual party

OR

Use it with Mkt_EnergyConsumer to represent the current MW/Mvar distribution within it's parent load group.

Table 179 shows all attributes of LoadDistributionFactor.

Table 179 – Attributes of ExternalInputs::LoadDistributionFactor

name	mult	type	description
pDistFactor	0..1	Float	Real power (MW) load distribution factor
qDistFactor	0..1	Float	Reactive power (MVar) load distribution factor

Table 180 shows all association ends of LoadDistributionFactor with other classes.

Table 180 – Association ends of ExternalInputs:: LoadDistributionFactor with other classes

mult from	name	mult to	type	description
0..*	DistributionFactorSet	0..*	DistributionFactorSet	
0..1	IndividualPnode	0..1	IndividualPnode	
1..*	AggregatedPnode	0..1	AggregatedPnode	

6.5.6.2.26 LossSensitivity

Loss sensitivity applied to a ConnectivityNode for a given time interval.

Table 181 shows all attributes of LossSensitivity.

Table 181 – Attributes of ExternalInputs::LossSensitivity

name	mult	type	description
lossFactor	0..1	Float	Loss penalty factor. Defined as: $1 / (1 - \text{Incremental Transmission Loss})$; with the Incremental Transmission Loss expressed as a plus or minus value. The typical range of penalty factors is (0,9 to 1,1).
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 182 shows all association ends of LossSensitivity with other classes.

Table 182 – Association ends of ExternalInputs::LossSensitivity with other classes

mult from	name	mult to	type	description
0..*	MktConnectivityNode	1..1	MktConnectivityNode	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.27 MWLimitSchedule root class

Maximum MW and optionally Minimum MW (Y1 and Y2, respectively).

Table 183 shows all association ends of MWLimitSchedule with other classes.

Table 183 – Association ends of ExternalInputs::MWLimitSchedule with other classes

mult from	name	mult to	type	description
1..1	SecurityConstraintLimit	1..1	ContingencyConstraintLimit	

6.5.6.2.28 MktACLineSegment

Subclass of IEC 61970:Wires:ACLineSegment.

Table 184 shows all attributes of MktACLineSegment.

Table 184 – Attributes of ExternalInputs::MktACLineSegment

name	mult	type	description
b0ch	0..1	Susceptance	inherited from: ACLineSegment
bch	0..1	Susceptance	inherited from: ACLineSegment
g0ch	0..1	Conductance	inherited from: ACLineSegment
gch	0..1	Conductance	inherited from: ACLineSegment
r	0..1	Resistance	inherited from: ACLineSegment
r0	0..1	Resistance	inherited from: ACLineSegment
shortCircuitEndTemperature	0..1	Temperature	inherited from: ACLineSegment
x	0..1	Reactance	inherited from: ACLineSegment
x0	0..1	Reactance	inherited from: ACLineSegment
length	0..1	Length	inherited from: Conductor
aggregate	0..1	Boolean	inherited from: Equipment
inService	0..1	Boolean	inherited from: Equipment
networkAnalysisEnabled	0..1	Boolean	inherited from: Equipment
normallyInService	0..1	Boolean	inherited from: Equipment
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 185 shows all association ends of MktACLineSegment with other classes.

Table 185 – Association ends of ExternalInputs::MktACLineSegment with other classes

mult from	name	mult to	type	description
0..*	EndAFlow	0..1	BranchEndFlow	
0..*	EndBFlow	0..1	BranchEndFlow	
1..1	Clamp	0..*	Clamp	inherited from: ACLineSegment
0..*	PerLengthImpedance	0..1	PerLengthImpedance	inherited from: ACLineSegment
1..1	Cut	0..*	Cut	inherited from: ACLineSegment
0..1	LineFaults	0..*	LineFault	inherited from: ACLineSegment
1..1	ACLineSegmentPhases	0..*	ACLineSegmentPhase	inherited from: ACLineSegment
0..*	BaseVoltage	0..1	BaseVoltage	inherited from: ConductingEquipment
1..1	SvStatus	0..*	SvStatus	inherited from: ConductingEquipment
0..*	ProtectionEquipments	0..*	ProtectionEquipment	inherited from: ConductingEquipment
1..1	Terminals	0..*	Terminal	inherited from: ConductingEquipment
0..1	OperationalLimitSet	0..*	OperationalLimitSet	inherited from: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	inherited from: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	inherited from: Equipment
0..1	Faults	0..*	Fault	inherited from: Equipment
0..*	AdditionalEquipmentContainer	0..*	EquipmentContainer	inherited from: Equipment
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.29 MktAnalogLimit

Subclass of IEC 61970:Meas:AnalogLimit.

Table 186 shows all attributes of MktAnalogLimit.

Table 186 – Attributes of ExternalInputs::MktAnalogLimit

name	mult	type	description
exceededLimit	0..1	Boolean	true if limit exceeded
limitType	0..1	AnalogLimitType	The type of limit the value represents Branch Limit Types: Short Term Medium Term Long Term Voltage Limits: High Low
value	0..1	Float	inherited from: AnalogLimit
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 187 shows all association ends of MktAnalogLimit with other classes.

Table 187 – Association ends of ExternalInputs::MktAnalogLimit with other classes

mult from	name	mult to	type	description
0..*	LimitSet	1..1	AnalogLimitSet	inherited from: AnalogLimit
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.30 MktAnalogLimitSet

Subclass of IEC 61970:Meas:AnalogLimitSet.

Table 188 shows all attributes of MktAnalogLimitSet.

Table 188 – Attributes of ExternalInputs::MktAnalogLimitSet

name	mult	type	description
ratingSet	0..1	Integer	Rating set numbers
isPercentageLimits	0..1	Boolean	inherited from: LimitSet
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 189 shows all association ends of MktAnalogLimitSet with other classes.

Table 189 – Association ends of ExternalInputs::MktAnalogLimitSet with other classes

mult from	name	mult to	type	description
1..1	Limits	0..*	AnalogLimit	inherited from: AnalogLimitSet
0..*	Measurements	0..*	Analog	inherited from: AnalogLimitSet
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.31 MktControlArea

Market subclass of IEC 61970:ControlArea.

Table 190 shows all attributes of MktControlArea.

Table 190 – Attributes of ExternalInputs::MktControlArea

name	mult	type	description
netInterchange	0..1	ActivePower	inherited from: ControlArea
pTolerance	0..1	ActivePower	inherited from: ControlArea
type	0..1	ControlAreaTypeKind	inherited from: ControlArea
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 191 shows all association ends of MktControlArea with other classes.

Table 191 – Association ends of ExternalInputs::MktControlArea with other classes

mult from	name	mult to	type	description
0..1	ControlAreaSolutionData	0..*	ControlAreaSolutionData	
0..1	EnergyArea	0..1	EnergyArea	inherited from: ControlArea
1..1	ControlAreaGeneratingUnit	0..*	ControlAreaGeneratingUnit	inherited from: ControlArea
1..1	TieFlow	0..*	TieFlow	inherited from: ControlArea
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.32 MktSeriesCompensator

Subclass of IEC 61970:Wires:SeriesCompensator.

Table 192 shows all attributes of MktSeriesCompensator.

Table 192 – Attributes of ExternalInputs::MktSeriesCompensator

name	mult	type	description
r	0..1	Resistance	inherited from: SeriesCompensator
r0	0..1	Resistance	inherited from: SeriesCompensator
x	0..1	Reactance	inherited from: SeriesCompensator
x0	0..1	Reactance	inherited from: SeriesCompensator
varistorPresent	0..1	Boolean	inherited from: SeriesCompensator
varistorRatedCurrent	0..1	CurrentFlow	inherited from: SeriesCompensator
varistorVoltageThreshold	0..1	Voltage	inherited from: SeriesCompensator
aggregate	0..1	Boolean	inherited from: Equipment
inService	0..1	Boolean	inherited from: Equipment
networkAnalysisEnabled	0..1	Boolean	inherited from: Equipment
normallyInService	0..1	Boolean	inherited from: Equipment
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 193 shows all association ends of MktSeriesCompensator with other classes.

Table 193 – Association ends of ExternalInputs::MktSeriesCompensator with other classes

mult from	name	mult to	type	description
0..*	EndBFlow	0..1	BranchEndFlow	
0..*	EndAFlow	0..1	BranchEndFlow	
0..*	BaseVoltage	0..1	BaseVoltage	inherited from: ConductingEquipment
1..1	SvStatus	0..*	SvStatus	inherited from: ConductingEquipment
0..*	ProtectionEquipments	0..*	ProtectionEquipment	inherited from: ConductingEquipment
1..1	Terminals	0..*	Terminal	inherited from: ConductingEquipment
0..1	OperationalLimitSet	0..*	OperationalLimitSet	inherited from: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	inherited from: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	inherited from: Equipment
0..1	Faults	0..*	Fault	inherited from: Equipment
0..*	AdditionalEquipmentContainer	0..*	EquipmentContainer	inherited from: Equipment
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource

mult from	name	mult to	type	description
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.33 MktShuntCompensator

Subclass of IEC 61970:Wires:ShuntCompensator.

Table 194 shows all attributes of MktShuntCompensator.

Table 194 – Attributes of ExternalInputs::MktShuntCompensator

name	mult	type	description
aVRDelay	0..1	Seconds	inherited from: ShuntCompensator
grounded	0..1	Boolean	inherited from: ShuntCompensator
maximumSections	0..1	Integer	inherited from: ShuntCompensator
nomU	0..1	Voltage	inherited from: ShuntCompensator
normalSections	0..1	Integer	inherited from: ShuntCompensator
phaseConnection	0..1	PhaseShuntConnectionKind	inherited from: ShuntCompensator
switchOnCount	0..1	Integer	inherited from: ShuntCompensator
switchOnDate	0..1	DateTime	inherited from: ShuntCompensator
voltageSensitivity	0..1	VoltagePerReactivePower	inherited from: ShuntCompensator
sections	0..1	Float	inherited from: ShuntCompensator
controlEnabled	0..1	Boolean	inherited from: RegulatingCondEq
aggregate	0..1	Boolean	inherited from: Equipment
inService	0..1	Boolean	inherited from: Equipment
networkAnalysisEnabled	0..1	Boolean	inherited from: Equipment
normallyInService	0..1	Boolean	inherited from: Equipment
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 195 shows all association ends of MktShuntCompensator with other classes.

Table 195 – Association ends of ExternalInputs::MktShuntCompensator with other classes

mult from	name	mult to	type	description
1..1	ShuntCompensatorDynamicData	0..*	ShuntCompensatorDynamicData	
1..1	ShuntCompensatorPhase	0..*	ShuntCompensatorPhase	inherited from: ShuntCompensator
1..1	SvShuntCompensatorSections	0..1	SvShuntCompensatorSections	inherited from: ShuntCompensator
0..*	RegulatingControl	0..1	RegulatingControl	inherited from: RegulatingCondEq
0..*	BaseVoltage	0..1	BaseVoltage	inherited from: ConductingEquipment
1..1	SvStatus	0..*	SvStatus	inherited from: ConductingEquipment
0..*	ProtectionEquipments	0..*	ProtectionEquipment	inherited from: ConductingEquipment
1..1	Terminals	0..*	Terminal	inherited from: ConductingEquipment
0..1	OperationalLimitSet	0..*	OperationalLimitSet	inherited from: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	inherited from: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	inherited from: Equipment
0..1	Faults	0..*	Fault	inherited from: Equipment
0..*	AdditionalEquipmentContainer	0..*	EquipmentContainer	inherited from: Equipment
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.34 MktSwitch

Subclass of IEC 61970:Wires:Switch.

Table 196 shows all attributes of MktSwitch.

Table 196 – Attributes of ExternalInputs::MktSwitch

name	mult	type	description
normalOpen	0..1	Boolean	inherited from: Switch
ratedCurrent	0..1	CurrentFlow	inherited from: Switch
switchOnCount	0..1	Integer	inherited from: Switch
switchOnDate	0..1	DateTime	inherited from: Switch
retained	0..1	Boolean	inherited from: Switch
open	0..1	Boolean	inherited from: Switch
aggregate	0..1	Boolean	inherited from: Equipment
inService	0..1	Boolean	inherited from: Equipment

name	mult	type	description
networkAnalysisEnabled	0..1	Boolean	inherited from: Equipment
normallyInService	0..1	Boolean	inherited from: Equipment
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 197 shows all association ends of MktSwitch with other classes.

Table 197 – Association ends of ExternalInputs::MktSwitch with other classes

mult from	name	mult to	type	description
1..1	SwitchStatus	0..*	SwitchStatus	
1..1	SwitchSchedules	0..*	SwitchSchedule	inherited from: Switch
1..1	SwitchPhase	0..*	SwitchPhase	inherited from: Switch
0..*	CompositeSwitch	0..1	CompositeSwitch	inherited from: Switch
0..*	BaseVoltage	0..1	BaseVoltage	inherited from: ConductingEquipment
1..1	SvStatus	0..*	SvStatus	inherited from: ConductingEquipment
0..*	ProtectionEquipments	0..*	ProtectionEquipment	inherited from: ConductingEquipment
1..1	Terminals	0..*	Terminal	inherited from: ConductingEquipment
0..1	OperationalLimitSet	0..*	OperationalLimitSet	inherited from: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	inherited from: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	inherited from: Equipment
0..1	Faults	0..*	Fault	inherited from: Equipment
0..*	AdditionalEquipmentContainer	0..*	EquipmentContainer	inherited from: Equipment
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.35 MktTapChanger

Subclass of IEC 61970:Wires:TapChanger.

Table 198 shows all attributes of MktTapChanger.

Table 198 – Attributes of ExternalInputs::MktTapChanger

name	mult	type	description
controlEnabled	0..1	Boolean	inherited from: TapChanger
highStep	0..1	Integer	inherited from: TapChanger
initialDelay	0..1	Seconds	inherited from: TapChanger
lowStep	0..1	Integer	inherited from: TapChanger
lfcFlag	0..1	Boolean	inherited from: TapChanger
neutralStep	0..1	Integer	inherited from: TapChanger
neutralU	0..1	Voltage	inherited from: TapChanger
normalStep	0..1	Integer	inherited from: TapChanger
subsequentDelay	0..1	Seconds	inherited from: TapChanger
step	0..1	Float	inherited from: TapChanger
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 199 shows all association ends of MktTapChanger with other classes.

Table 199 – Association ends of ExternalInputs::MktTapChanger with other classes

mult from	name	mult to	type	description
1..1	TapChangerDynamicData	0..*	TapChangerDynamicData	
0..*	TapChangerControl	0..1	TapChangerControl	inherited from: TapChanger
1..1	TapSchedules	0..*	TapSchedule	inherited from: TapChanger
1..1	SvTapStep	0..1	SvTapStep	inherited from: TapChanger
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.36 NodeConstraintTerm

To be used only to constrain a quantity that cannot be associated with a terminal. For example, a registered generating unit that is not electrically connected to the network.

Table 200 shows all attributes of NodeConstraintTerm.

Table 200 – Attributes of ExternalInputs::NodeConstraintTerm

name	mult	type	description
factor	0..1	String	inherited from: ConstraintTerm
function	0..1	String	inherited from: ConstraintTerm
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 201 shows all association ends of NodeConstraintTerm with other classes.

Table 201 – Association ends of ExternalInputs::NodeConstraintTerm with other classes

mult from	name	mult to	type	description
0..*	MktConnectivityNode	1..1	MktConnectivityNode	
0..*	SecurityConstraintSum	1..1	SecurityConstraintSum	inherited from: ConstraintTerm
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.37 Profile

A profile is a simpler curve type.

Table 202 shows all attributes of Profile.

Table 202 – Attributes of ExternalInputs::Profile

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 203 shows all association ends of Profile with other classes.

Table 203 – Association ends of ExternalInputs::Profile with other classes

mult from	name	mult to	type	description
0..*	ProfileDatas	0..*	ProfileData	A profile has profile data associated with it.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.38 ProfileData root class

Data for profile.

Table 204 shows all attributes of ProfileData.

Table 204 – Attributes of ExternalInputs::ProfileData

name	mult	type	description
bidPrice	0..1	Float	Bid price associated with contract
capacityLevel	0..1	ActivePower	Capacity level for the profile, in MW.
energyLevel	0..1	RealEnergy	Energy level for the profile, in MWH.
minimumLevel	0..1	Float	Minimum MW value of contract
sequenceNumber	0..1	Integer	Sequence to provide item numbering for the profile. { greater than or equal to 1 }
startDateTime	0..1	DateTime	Start date/time for this profile.
stopDateTime	0..1	DateTime	Stop date/time for this profile.

Table 205 shows all association ends of ProfileData with other classes.

Table 205 – Association ends of ExternalInputs::ProfileData with other classes

mult from	name	mult to	type	description
0..*	Profile	0..*	Profile	A profile has profile data associated with it.

6.5.6.2.39 ReserveDemandCurve

Reserve demand curve. Models maximum quantities of reserve required per Market Region and models a reserve demand curve for the minimum quantities of reserve. The ReserveDemandCurve is a relationship between unit operating reserve price in \$/MWhr (Y-axis) and unit reserves in MW (X-axis).

Table 206 shows all attributes of ReserveDemandCurve.

Table 206 – Attributes of ExternalInputs::ReserveDemandCurve

name	mult	type	description
reqMaxMW	0..1	Float	Region requirement maximum limit
reserveRequirementType	0..1	ReserveRequirementType	Reserve requirement type that the max and curve apply to. For example, operating reserve, regulation and contingency.
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve

name	mult	type	description
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 207 shows all association ends of ReserveDemandCurve with other classes.

**Table 207 – Association ends of ExternalInputs::
ReserveDemandCurve with other classes**

mult from	name	mult to	type	description
1..*	ASRequirements	1..1	ASRequirements	
0..*	MarketRegion	1..1	MarketRegion	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.40 SCADAInformation root class

Contains information about the update from SCADA.

Table 208 shows all attributes of SCADAInformation.

Table 208 – Attributes of ExternalInputs::SCADAInformation

name	mult	type	description
timeStamp	0..1	DateTime	time of the update from SCADA

6.5.6.2.41 SecurityConstraintSum

Typically provided by RTO systems, constraints identified in both base case and critical contingency cases have to be transferred.

A constraint has N (≥ 1) constraint terms. A term is represented by an instance of TerminalConstraintTerm.

The constraint expression is:

$$\text{minValue} \leq c1 \cdot x1 + c2 \cdot x2 + \dots + cn \cdot xn + k \leq \text{maxValue}$$

where:

- cn is ConstraintTerm.factor
- xn is the flow at the terminal

Flow into the associated equipment is positive for the purpose of ConnectivityNode NodeConstraintTerm.

k is SecurityConstraintsLinear.resourceMW.

The units of k are assumed to be same as the units of the flows, xn. The constants, cn, are dimensionless.

With these conventions, cn and k are all positive for a typical constraint such as "weighted sum of generation shall be less than limit". Furthermore, cn are all 1.0 for a case such as "interface flow shall be less than limit", assuming the terminals are chosen on the importing side of the interface.

Table 209 shows all attributes of SecurityConstraintSum.

Table 209 – Attributes of ExternalInputs::SecurityConstraintSum

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 210 shows all association ends of SecurityConstraintSum with other classes.

**Table 210 – Association ends of ExternalInputs::
SecurityConstraintSum with other classes**

mult from	name	mult to	type	description
1..1	ConstraintTerms	0..*	ConstraintTerm	
0..*	RTO	0..1	RTO	
1..1	BaseCaseConstraintLimit	0..1	BaseCaseConstraintLimit	
1..1	ContingencyConstraintLimits	0..*	ContingencyConstraintLimit	
1..1	DefaultConstraintLimit	0..1	DefaultConstraintLimit	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors

mult from	name	mult to	type	description
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.42 SecurityConstraints

Typical for regional transmission operators (RTOs), these constraints include transmission as well as generation group constraints identified in both base case and critical contingency cases.

Table 211 shows all attributes of SecurityConstraints.

Table 211 – Attributes of ExternalInputs::SecurityConstraints

name	mult	type	description
minMW	0..1	ActivePower	Minimum MW limit (only for transmission constraints).
maxMW	0..1	ActivePower	Maximum MW limit
actualMW	0..1	ActivePower	Actual branch or group of branches MW flow (only for transmission constraints)
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 212 shows all association ends of SecurityConstraints with other classes.

Table 212 – Association ends of ExternalInputs::SecurityConstraints with other classes

mult from	name	mult to	type	description
0..*	RTO	0..1	RTO	
0..*	GeneratingBid	0..1	GeneratingBid	
0..1	Flowgate	0..1	Flowgate	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.43 ServicePoint

The defined termination points of a transmission path. Service points are defined from the viewpoint of the transmission service. Each service point is contained within (or on the boundary of) an interchange area. A service point is source or destination of a transaction.

Table 213 shows all attributes of ServicePoint.

Table 213 – Attributes of ExternalInputs::ServicePoint

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 214 shows all association ends of ServicePoint with other classes.

Table 214 – Association ends of ExternalInputs::ServicePoint with other classes

mult from	name	mult to	type	description
1..1	PORTransmissionPath	0..*	TransmissionPath	A transmission path has a "point-of-receipt" service point
1..1	PODTransmissionPath	0..*	TransmissionPath	A transmission path has a "point-of-delivery" service point
0..1	SourceReservation	0..*	TransmissionReservation	
0..1	SinkReservation	0..*	TransmissionReservation	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.44 ShuntCompensatorDynamicData root class

Optimal Power Flow or State Estimator Filter Bank Data for OTS. This is used for RealTime, Study and Maintenance Users.

Table 215 shows all attributes of ShuntCompensatorDynamicData.

Table 215 – Attributes of ExternalInputs::ShuntCompensatorDynamicData

name	mult	type	description
mVARInjection	0..1	Float	The injection of reactive power of the filter bank in the NA solution or VCS reactive power production
connectionStatus	0..1	Integer	The current status for the Voltage Control Capacitor 1= Connected 0 = Disconnected
desiredVoltage	0..1	Float	The desired voltage for the Voltage Control Capacitor
voltageRegulationStatus	0..1	Boolean	Indicator if the voltage control this is regulating True = Yes, False = No
stepPosition	0..1	Integer	Voltage control capacitor step position

Table 216 shows all association ends of ShuntCompensatorDynamicData with other classes.

Table 216 – Association ends of ExternalInputs::ShuntCompensatorDynamicData with other classes

mult from	name	mult to	type	description
0..*	MktShuntCompensator	1..1	MktShuntCompensator	

6.5.6.2.45 SwitchStatus root class

Optimal Power Flow or State Estimator Circuit Breaker Status.

Table 217 shows all attributes of SwitchStatus.

Table 217 – Attributes of ExternalInputs::SwitchStatus

name	mult	type	description
switchStatus	0..1	SwitchStatusType	Circuit Breaker Status (closed or open) of the circuit breaker from the power flow.

Table 218 shows all association ends of SwitchStatus with other classes.

Table 218 – Association ends of ExternalInputs::SwitchStatus with other classes

mult from	name	mult to	type	description
0..*	MktSwitch	1..1	MktSwitch	

6.5.6.2.46 SysLoadDistributionFactor root class

This class models the system distribution factors. This class needs to be used along with the HostControlArea and the ConnectivityNode to show the distribution of each individual party.

Table 219 shows all attributes of SysLoadDistributionFactor.

Table 219 – Attributes of ExternalInputs::SysLoadDistributionFactor

name	mult	type	description
factor	0..1	Float	Used to calculate load "participation" of a connectivity node in an host control area

Table 220 shows all association ends of SysLoadDistributionFactor with other classes.

Table 220 – Association ends of ExternalInputs::SysLoadDistributionFactor with other classes

mult from	name	mult to	type	description
0..1	MktConnectivityNode	1..1	MktConnectivityNode	
0..*	DistributionFactorSet	0..*	DistributionFactorSet	
0..*	HostControlArea	1..1	HostControlArea	

6.5.6.2.47 TREntitlement root class

A Transmission Right(TR) can be a chain of TR's or on individual.

When a transmission right is not a chain, this is formally the ETC/TOR Entitlement for each ETC/TOR contract with the inclusion of CVR(Converted Rights) as an ETC. This is the sum of all entitlements on all related transmission interfaces for the same TR.

When TR is a chain, its entitlement is the minimum of all entitlements for the individual TRs in the chain.

Table 221 shows all attributes of TREntitlement.

Table 221 – Attributes of ExternalInputs::TREntitlement

name	mult	type	description
entitlement	0..1	Float	The entitlement
startOperatingDate	0..1	DateTime	Operating date and hour when the entitlement applies

Table 222 shows all association ends of TREntitlement with other classes.

Table 222 – Association ends of ExternalInputs::TREntitlement with other classes

mult from	name	mult to	type	description
0..*	TransmissionContractRight	1..1	ContractRight	

6.5.6.2.48 TapChangerDynamicData root class

Optimal Power Flow or State Estimator Phase Shifter Data. This is used for RealTime, Study and Maintenance Users. SE Solution Phase Shifter Measurements from the last run of SE.

Table 223 shows all attributes of TapChangerDynamicData.

Table 223 – Attributes of ExternalInputs::TapChangerDynamicData

name	mult	type	description
tapPosition	0..1	Float	Tap position of the phase shifter, high-side tap position of the transformer, or low-side tap position of the transformer
desiredVoltage	0..1	Float	The desired voltage for the LTC
voltageRegulationStatus	0..1	Boolean	Indicator if the LTC transformer is regulating True = Yes, False = No
angleRegulationStatus	0..1	Boolean	True means the phase shifter is regulating.
desiredMW	0..1	Float	Phase Shifter Desired MW. The active power regulation setpoint of the phase shifter
solvedAngle	0..1	Float	Phase Shifter Angle. The solved phase angle shift of the phase shifter
minimumAngle	0..1	Float	The minimum phase angle shift of the phase shifter
maximumAngle	0..1	Float	The maximum phase angle shift of the phase shifter

Table 224 shows all association ends of TapChangerDynamicData with other classes.

Table 224 – Association ends of ExternalInputs::TapChangerDynamicData with other classes

mult from	name	mult to	type	description
0..*	MktTapChanger	1..1	MktTapChanger	

6.5.6.2.49 TerminalConstraintTerm

A constraint term associated with a specific terminal on a physical piece of equipment.

Table 225 shows all attributes of TerminalConstraintTerm.

Table 225 – Attributes of ExternalInputs::TerminalConstraintTerm

name	mult	type	description
factor	0..1	String	inherited from: ConstraintTerm
function	0..1	String	inherited from: ConstraintTerm
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 226 shows all association ends of TerminalConstraintTerm with other classes.

Table 226 – Association ends of ExternalInputs::TerminalConstraintTerm with other classes

mult from	name	mult to	type	description
0..*	MktTerminal	1..1	MktTerminal	
0..*	SecurityConstraintSum	1..1	SecurityConstraintSum	inherited from: ConstraintTerm
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.50 TransferInterface

A Transfer Interface is made up of branches such as transmission lines and transformers.

Table 227 shows all attributes of TransferInterface.

Table 227 – Attributes of ExternalInputs::TransferInterface

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 228 shows all association ends of TransferInterface with other classes.

Table 228 – Association ends of ExternalInputs::TransferInterface with other classes

mult from	name	mult to	type	description
1..1	TransferInterfaceSolution	1..1	TransferInterfaceSolution	
0..*	HostControlArea	0..1	HostControlArea	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.51 TransferInterfaceSolution root class

TNA Interface Definitions from OPF for VSA.

Table 229 shows all attributes of TransferInterfaceSolution.

Table 229 – Attributes of ExternalInputs::TransferInterfaceSolution

name	mult	type	description
interfaceMargin	0..1	Float	The margin for the interface
transferLimit	0..1	Float	Transfer Interface + Limit Attribute Usage: The absolute of the maximum flow on the transfer interface. This is a positive MW value.
postTransferMW	0..1	Float	Post Transfer MW for step

Table 230 shows all association ends of TransferInterfaceSolution with other classes.

Table 230 – Association ends of ExternalInputs::TransferInterfaceSolution with other classes

mult from	name	mult to	type	description
1..1	TransferInterface	1..1	TransferInterface	
0..1	MktContingencyA	0..1	MktContingency	
0..1	MktContingencyB	0..1	MktContingency	

6.5.6.2.52 TransmissionCapacity root class

This class models the transmission (either a transmission interface or a POR/POD pair) capacity including Total Transfer Capacity (TTC), Operating Transfer Capacity (OTC), and Capacity Benefit Margin (CBM).

Table 231 shows all attributes of TransmissionCapacity.

Table 231 – Attributes of ExternalInputs::TransmissionCapacity

name	mult	type	description
capacityBenefitMargin	0..1	Float	Capacity Benefit Margin (CBM) is used by Markets to calculate the transmission interface limits. This number could be manually or procedurally determined. The CBM is defined per transmission interface (branch group).
operationalTransmissionCapacity	0..1	Float	The Operational Transmission Capacity (OTC) is the transmission capacity under the operating condition during a specific time period, incorporating the effects of derates and current settings of operation controls. The OTCs for all transmission interface (branch group) are always provided regardless of outage or switching conditions.
OTC15min_emergency	0..1	Float	The Operational Transmission Capacity (OTC) 15 minute Emergency Limit
OTCemergency	0..1	Float	The Operational Transmission Capacity (OTC) Emergency Limit.
POD	0..1	String	point of delivery
POR	0..1	String	point of receipt
startOperatingDate	0..1	DateTime	Operating date & hour when the entitlement applies
totalTransmissionCapacity	0..1	Float	Total Transmission Capacity

Table 232 shows all association ends of TransmissionCapacity with other classes.

Table 232 – Association ends of ExternalInputs::TransmissionCapacity with other classes

mult from	name	mult to	type	description
0..*	GenericConstraints	0..1	GenericConstraints	
0..*	Flowgate	0..1	Flowgate	

6.5.6.2.53 TransmissionInterfaceRightEntitlement root class

This is formally called the branch group ETC/TOR entitlement with the inclusion of CVR as ETC. This could be also used to represent the TR entitlement on a POR/POD.

Table 233 shows all attributes of TransmissionInterfaceRightEntitlement.

Table 233 – Attributes of ExternalInputs::TransmissionInterfaceRightEntitlement

name	mult	type	description
entitlement	0..1	Float	the entitlement
POD	0..1	String	point of delivery
POR	0..1	String	point of receipt
startOperatingDate	0..1	DateTime	Operating date and hour when the entitlement applies

Table 234 shows all association ends of TransmissionInterfaceRightEntitlement with other classes.

Table 234 – Association ends of ExternalInputs::TransmissionInterfaceRightEntitlement with other classes

mult from	name	mult to	type	description
0..*	ContractRight	1..1	ContractRight	
0..*	Flowgate	0..1	Flowgate	

6.5.6.2.54 TransmissionPath

An electrical connection, link, or line consisting of one or more parallel transmission elements between two areas of the interconnected electric systems, or portions thereof. TransmissionCorridor and TransmissionRightOfWay refer to legal aspects. The TransmissionPath refers to the segments between a TransmissionProvider's ServicePoints.

Table 235 shows all attributes of TransmissionPath.

Table 235 – Attributes of ExternalInputs::TransmissionPath

name	mult	type	description
availTransferCapability	0..1	ActivePower	The available transmission capability of a transmission path for the reference direction.
parallelPathFlag	0..1	Boolean	Flag which indicates if the transmission path is also a designated interconnection "parallel path".
totalTransferCapability	0..1	ActivePower	The total transmission capability of a transmission path in the reference direction.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 236 shows all association ends of TransmissionPath with other classes.

Table 236 – Association ends of ExternalInputs::TransmissionPath with other classes

mult from	name	mult to	type	description
1..1	TransmissionReservation	0..*	TransmissionReservation	
0..*	PointOfReceipt	1..1	ServicePoint	A transmission path has a "point-of-receipt" service point
0..*	DeliveryPoint	1..1	ServicePoint	A transmission path has a "point-of-delivery" service point
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.2.55 TransmissionReservation root class

A transmission reservation is obtained from the OASIS system to reserve transmission for a specified time period, transmission path and transmission product.

Table 237 shows all association ends of TransmissionReservation with other classes.

Table 237 – Association ends of ExternalInputs::TransmissionReservation with other classes

mult from	name	mult to	type	description
0..1	EnergyTransaction	0..1	EnergyTransaction	
0..1	TransactionBid	0..1	TransactionBid	
0..*	Source	0..1	ServicePoint	
0..*	Sink	0..1	ServicePoint	
0..*	TransmissionPath	1..1	TransmissionPath	

6.5.6.2.56 UnitInitialConditions

Resource status at the end of a given clearing period.

Table 238 shows all attributes of UnitInitialConditions.

Table 238 – Attributes of ExternalInputs::UnitInitialConditions

name	mult	type	description
cumEnergy	0..1	RealEnergy	Cumulative energy production over trading period.
cumStatusChanges	0..1	Integer	Cumulative number of status changes of the resource.
numberOfStartups	0..1	Integer	Number of start ups in the Operating Day until the end of previous hour.
onlineStatus	0..1	Boolean	'true' if the GeneratingUnit is currently On-Line
resourceMW	0..1	ActivePower	Resource MW output at the end of previous clearing period.
resourceStatus	0..1	Integer	Resource status at the end of previous clearing period: 0 – off-line 1 – on-line production 2 – in shutdown process 3 – in startup process
statusDate	0..1	DateTime	Time and date for resourceStatus
timeInStatus	0..1	Float	Time in market trading intervals the resource is in the state as of the end of the previous clearing period.
timeInterval	0..1	DateTime	Time interval
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 239 shows all association ends of UnitInitialConditions with other classes.

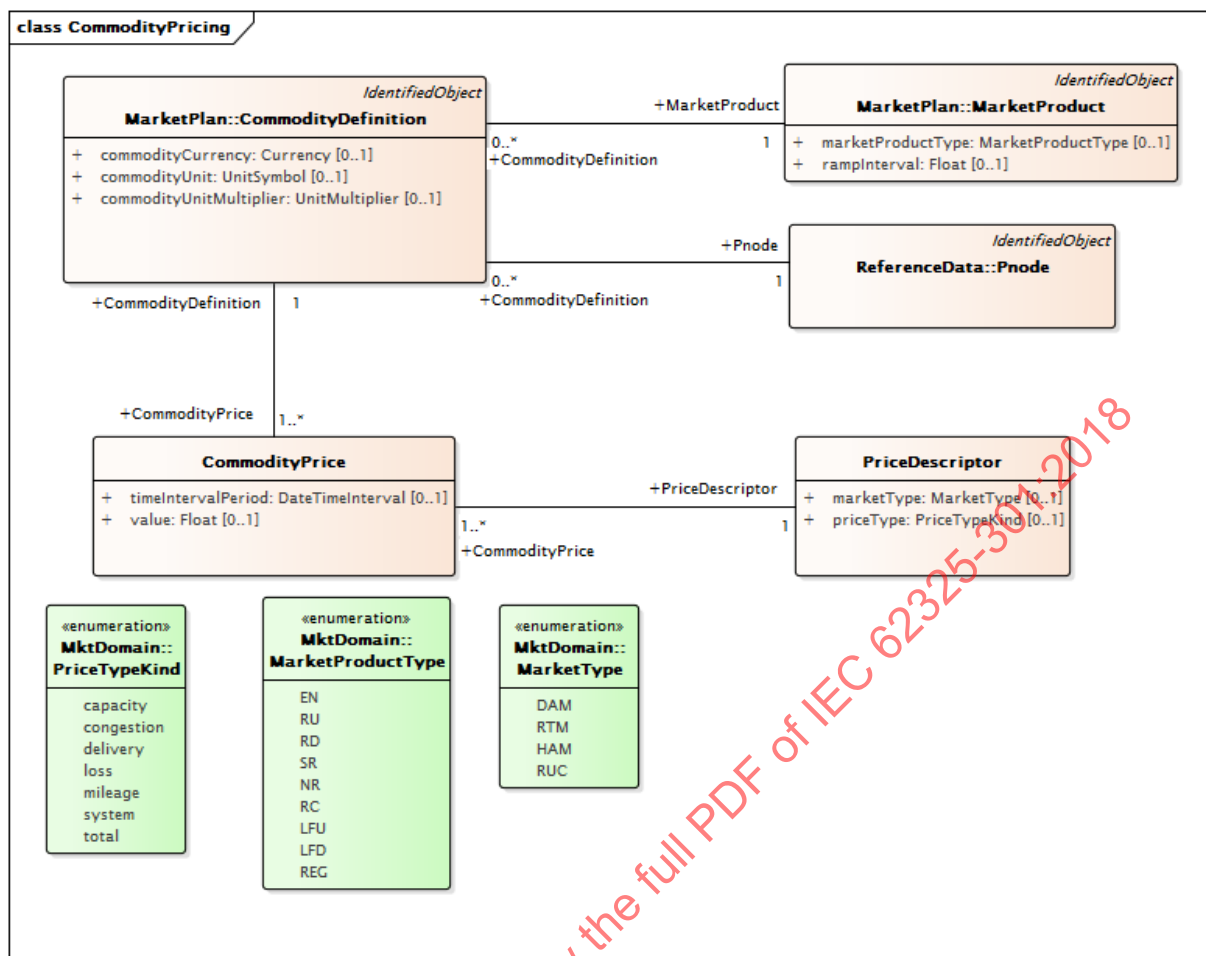
Table 239 – Association ends of ExternalInputs::UnitInitialConditions with other classes

mult from	name	mult to	type	description
0..*	GeneratingUnit	0..1	RegisteredGenerator	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3 Package MarketResults

6.5.6.3.1 General

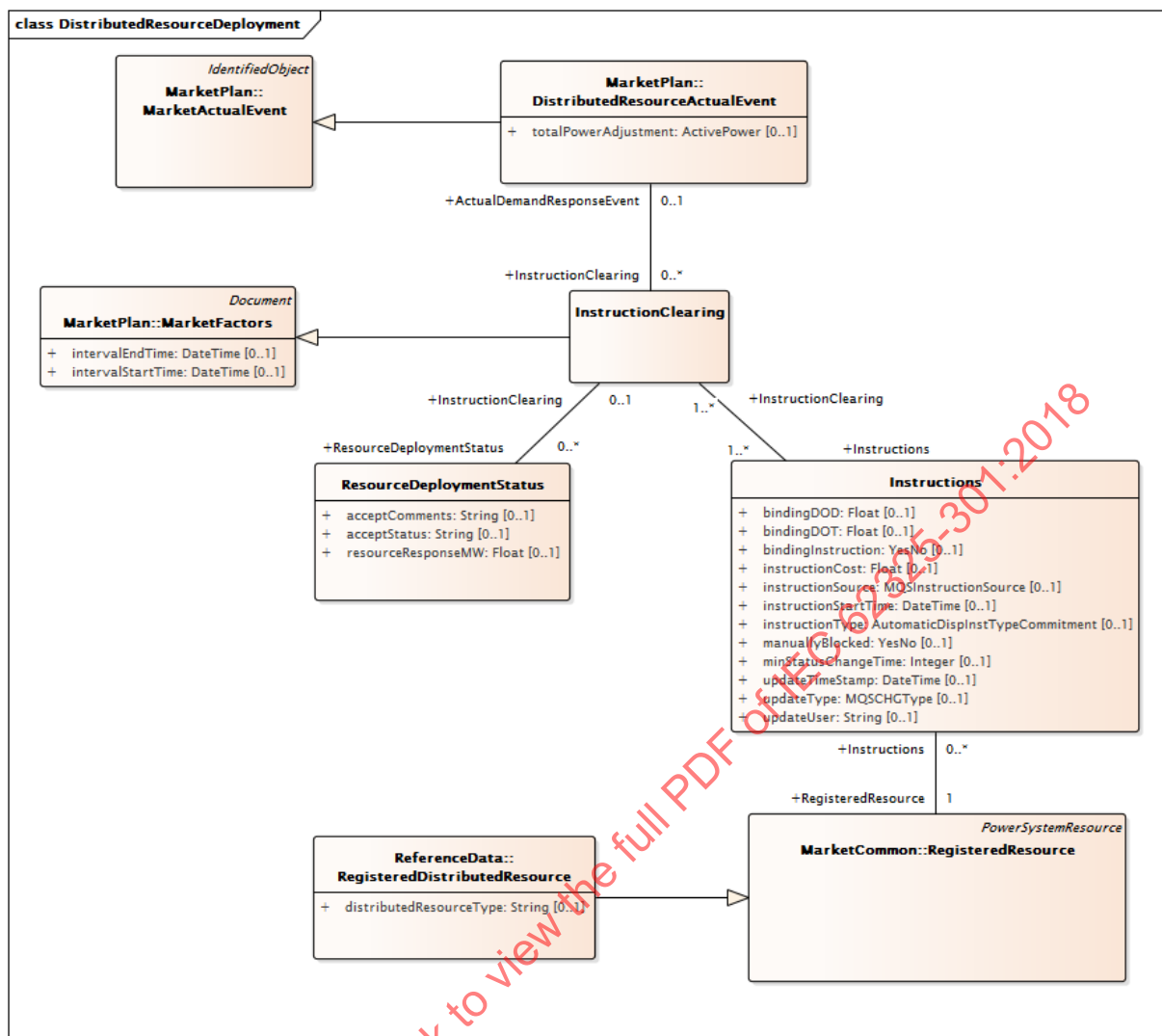
Results from the execution of a market.



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Figure 44 – Class diagram MarketResults::CommodityPricing

Figure 44: Illustrates how CommodityDefinitions are defined for a Market Product at a Pricing Node. CommodityPrices for specific time intervals can be defined for a CommodityDefinition. Each CommodityPrice has a PriceDescriptor which specifies the market type and pricing type.



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Figure 45 – Class diagram MarketResults::DistributedResourceDeployment

Figure 45: Illustrates the classes involved in a Registered Distributed Resource deployment. Event driven deployments are defined by the DistributedResourceActualEvent class which inherits from the MarketActualEvent class. Instructions which includes the binding dispatch operating target or binding dispatch operating delta along with the instruction start time and instruction type are sent to the RegisteredDistributedResources. Deployments that are resource specific, event driven or bulk are all support by these classes.

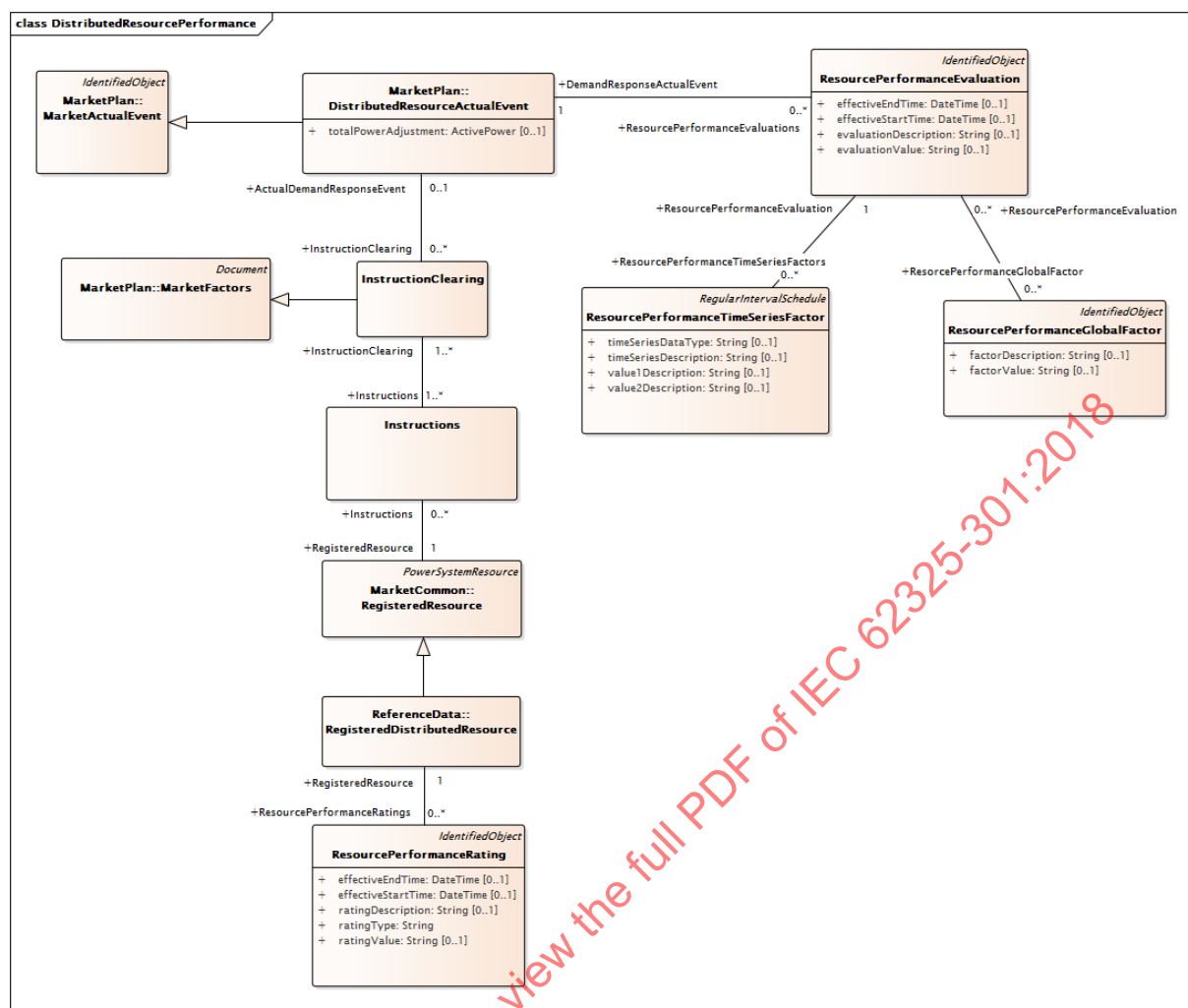
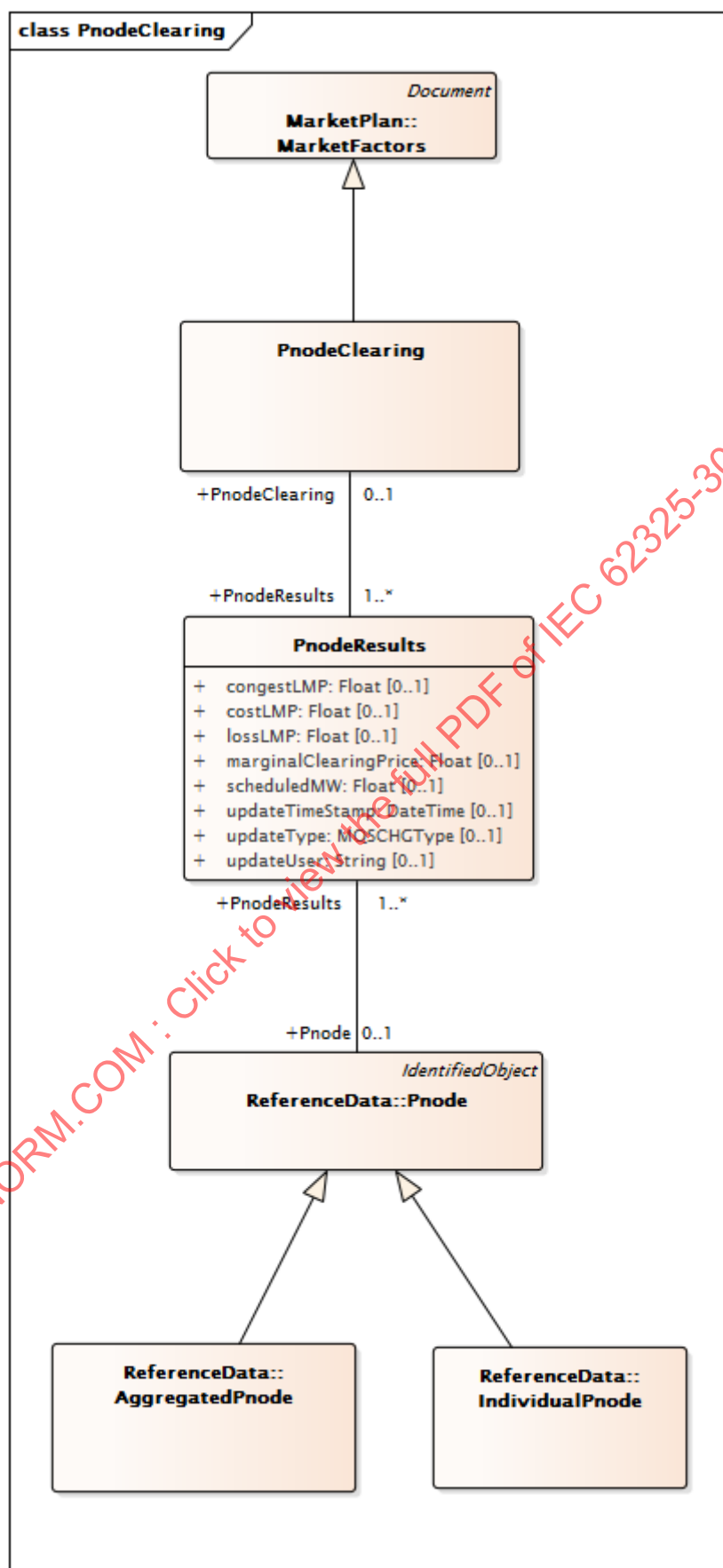


Figure 46 – Class diagram MarketResults::DistributedResourcePerformance

Figure 46: Illustrates performance evaluation support for RegisteredDistributedResources. After revenue-quality metering has been received, a ResourcePerformanceEvaluation instance may be created for each Resource per DR Event.



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Figure 47 – Class diagram MarketResults::PnodeClearing

Figure 47: Shows the classes and relationships used to model the results of pnode clearing for each Pnode per interval. The intervals are defined by PnodeClearing which inherits from MarketFactors. PnodeResults contains the results for each Pnode.

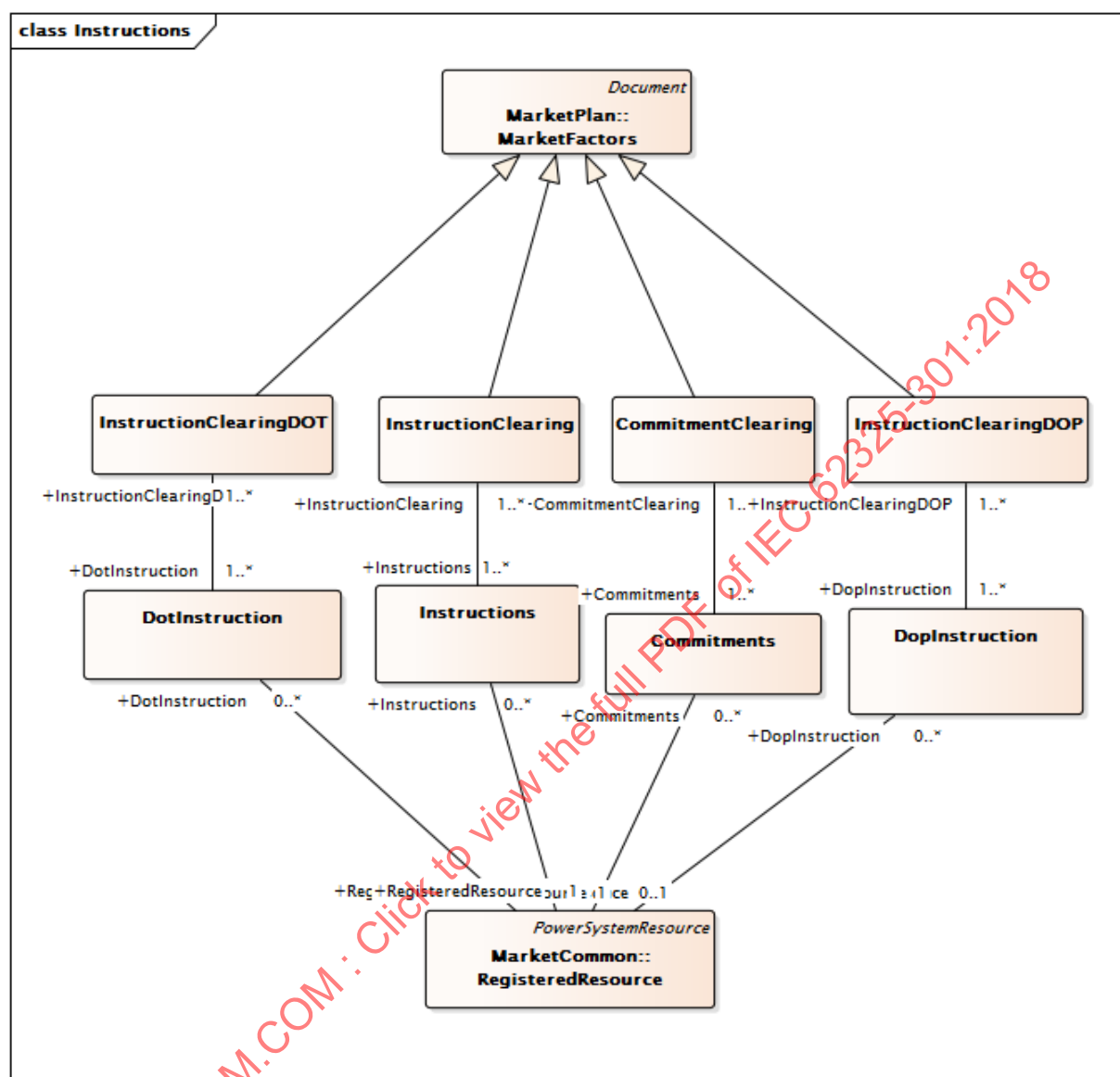


Figure 48 – Class diagram MarketResults::Instructions

Figure 48: Shows the classes used to model the instructions sent to market participants following a market clearing. The major classes and relationships include the RegisteredResource class that models the participating resource, the Commitment and CommitmentClearing classes which model results which calls for commitment of resource. The DotInstruction and DoplInstruction allow the modeling of the results of a dynamic (or lookahead) dispatch that may be used in the real time market.

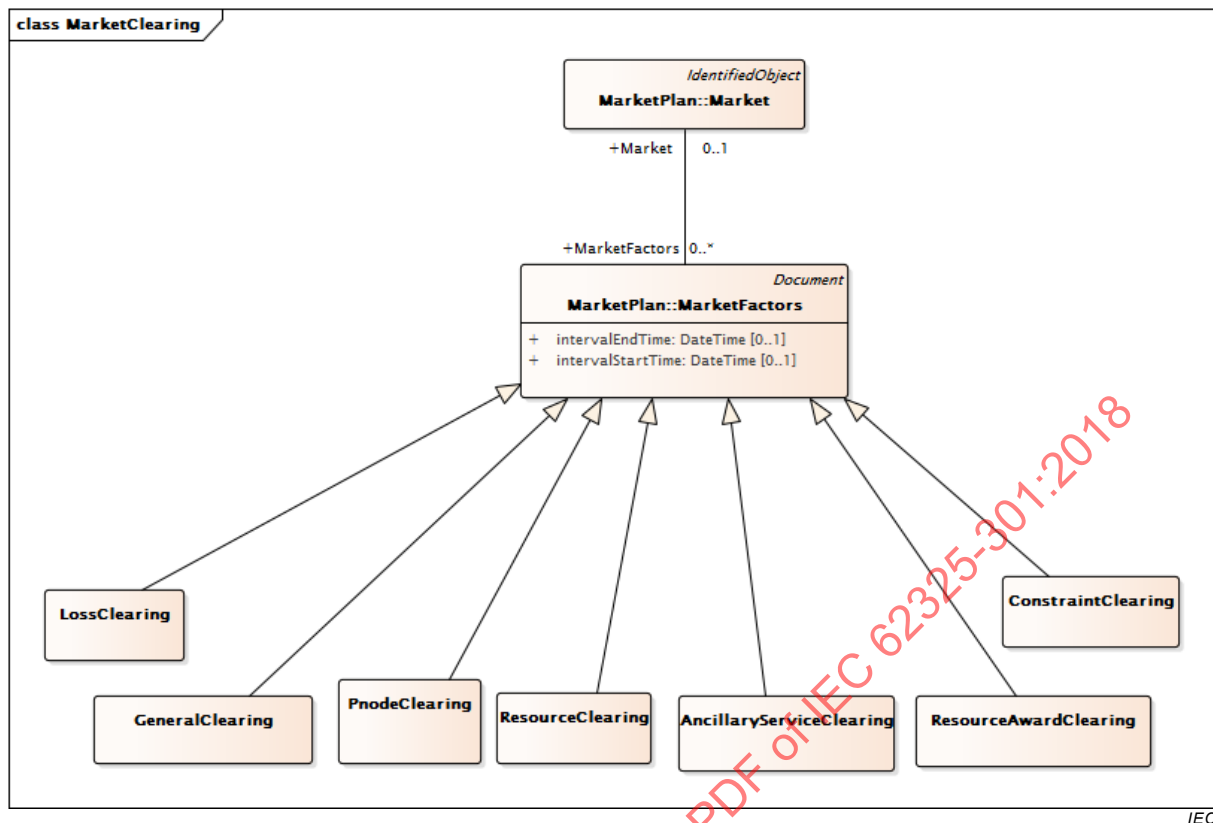


Figure 49 – Class diagram MarketResults::MarketClearing

Figure 49: Shows how each of the defined market clearing classes inherit from the MarketFactors class to allow definition of the market time intervals and the execution type within the market.

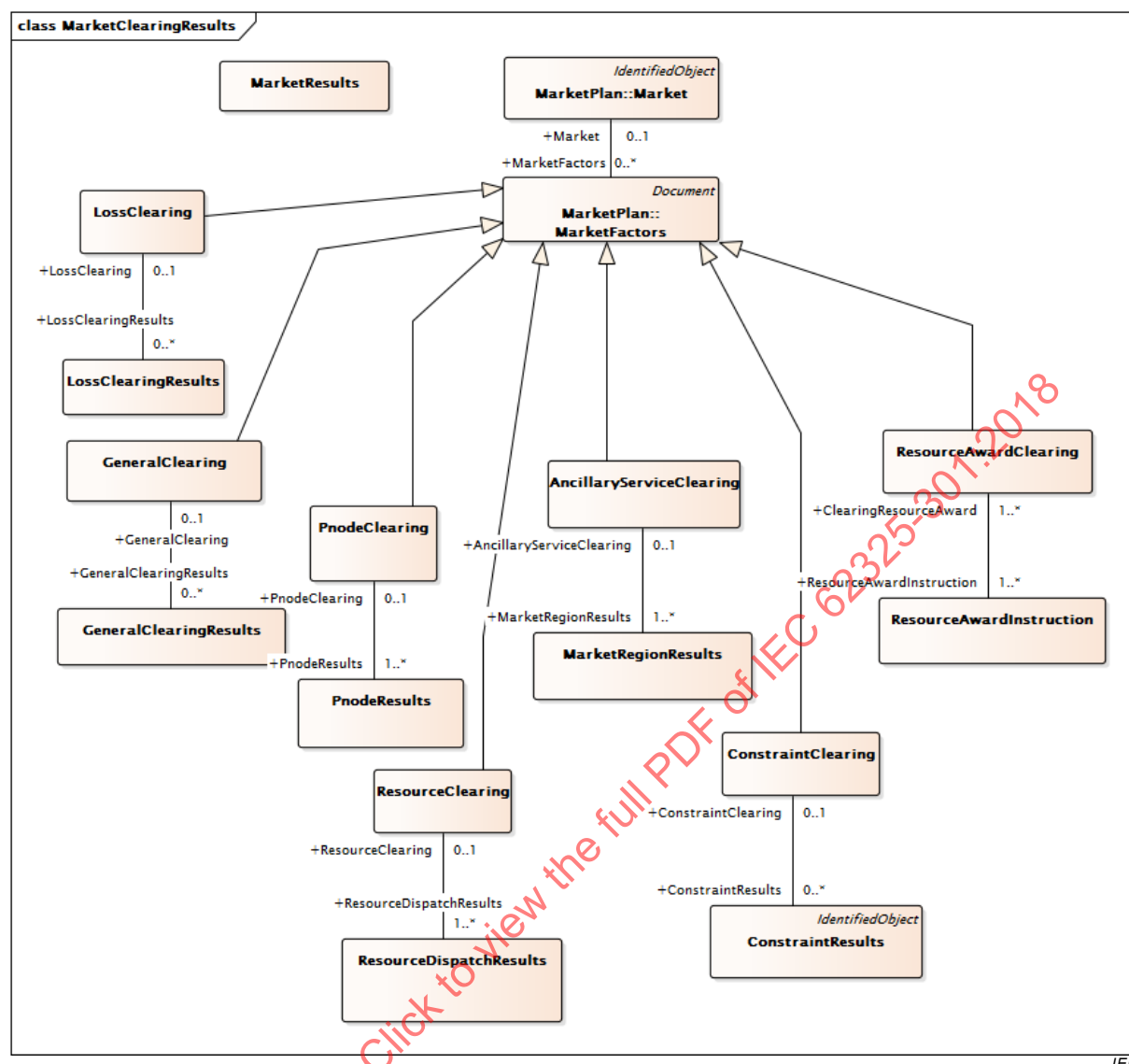


Figure 50 – Class diagram MarketResults::MarketClearingResults

Figure 50: Shows the classes and relationships used to model the results of the market clearing at an overview level. The Market Results class summarizes the market run. The LossClearingResults Class summarizes losses. The GeneralClearingResults is used to model the cleared load on a load zone basis. The PnodeClearing and PnodeClearingResults classes are used to model the locational marginal prices (LMPs) at the level of individual pricing nodes. The ResourceClearing and ResourceDispatchInstruction classes include the dispatch instructions and indicator of a normal case or contingency case dispatch. The AncillaryServiceClearing class includes information on ancillary services. The ConstraintResults class contains the constraints that are binding and their associated shadow costs. The ResourceAwardInstruction includes Active Power awards and LMP information.

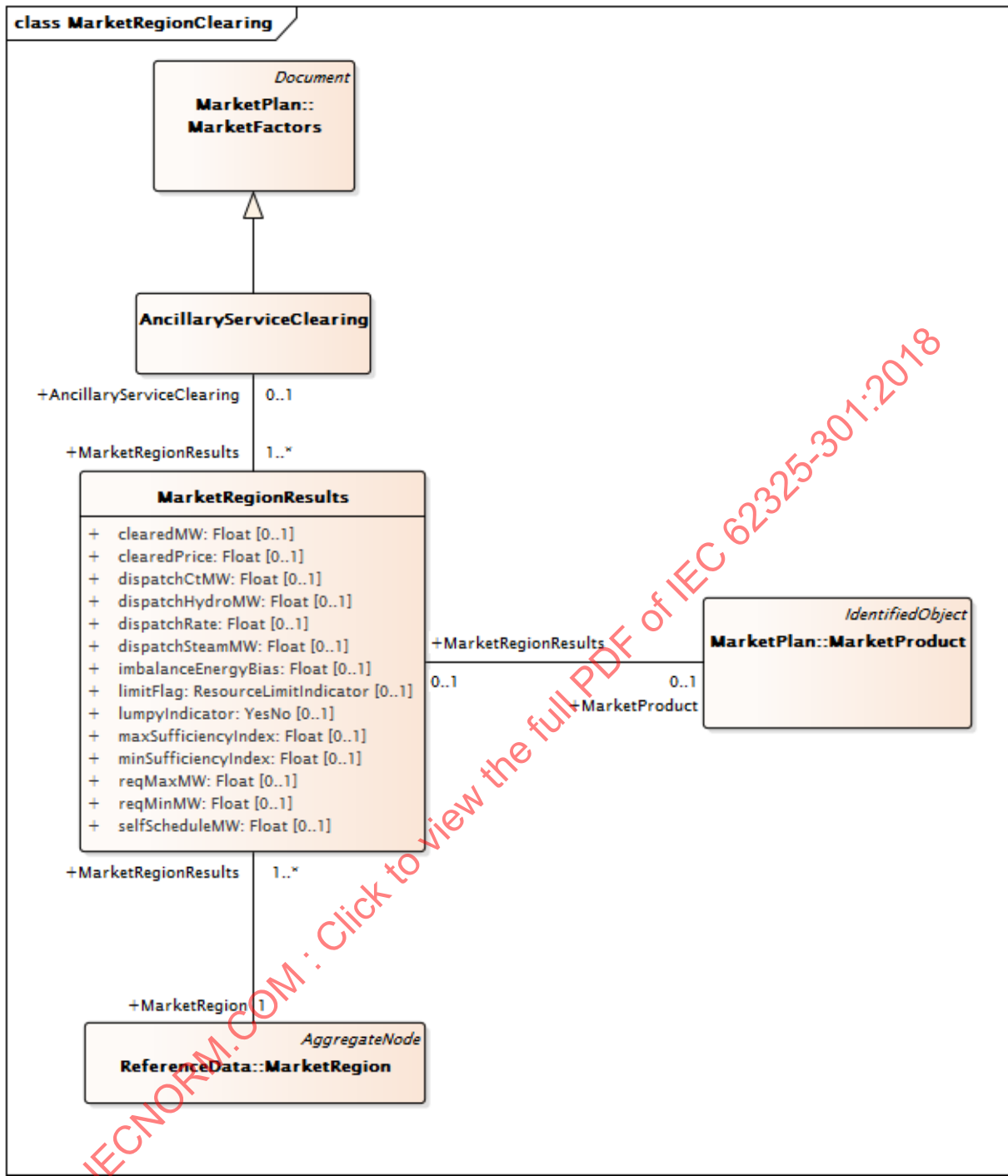
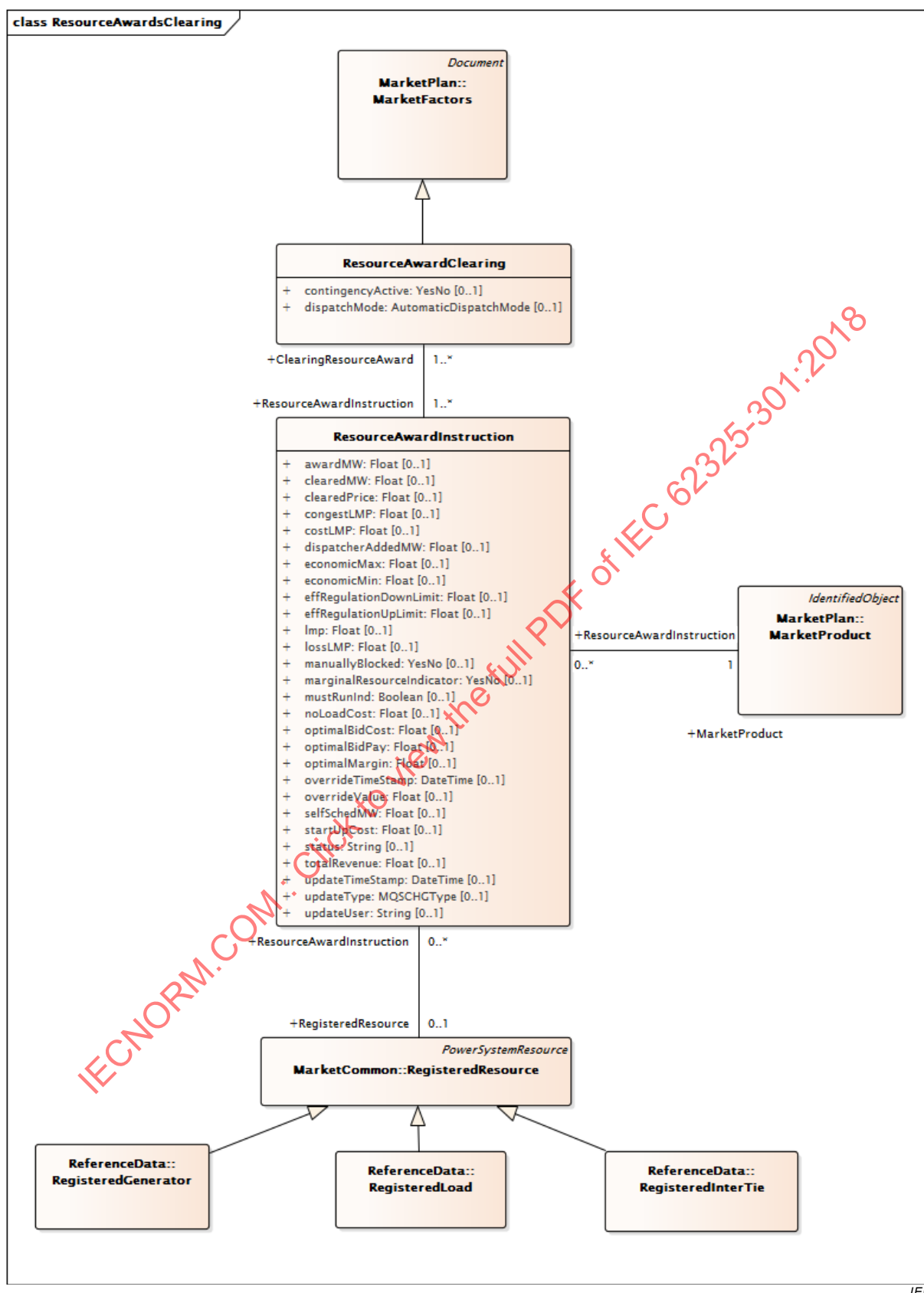


Figure 51 – Class diagram MarketResults::MarketRegionClearing

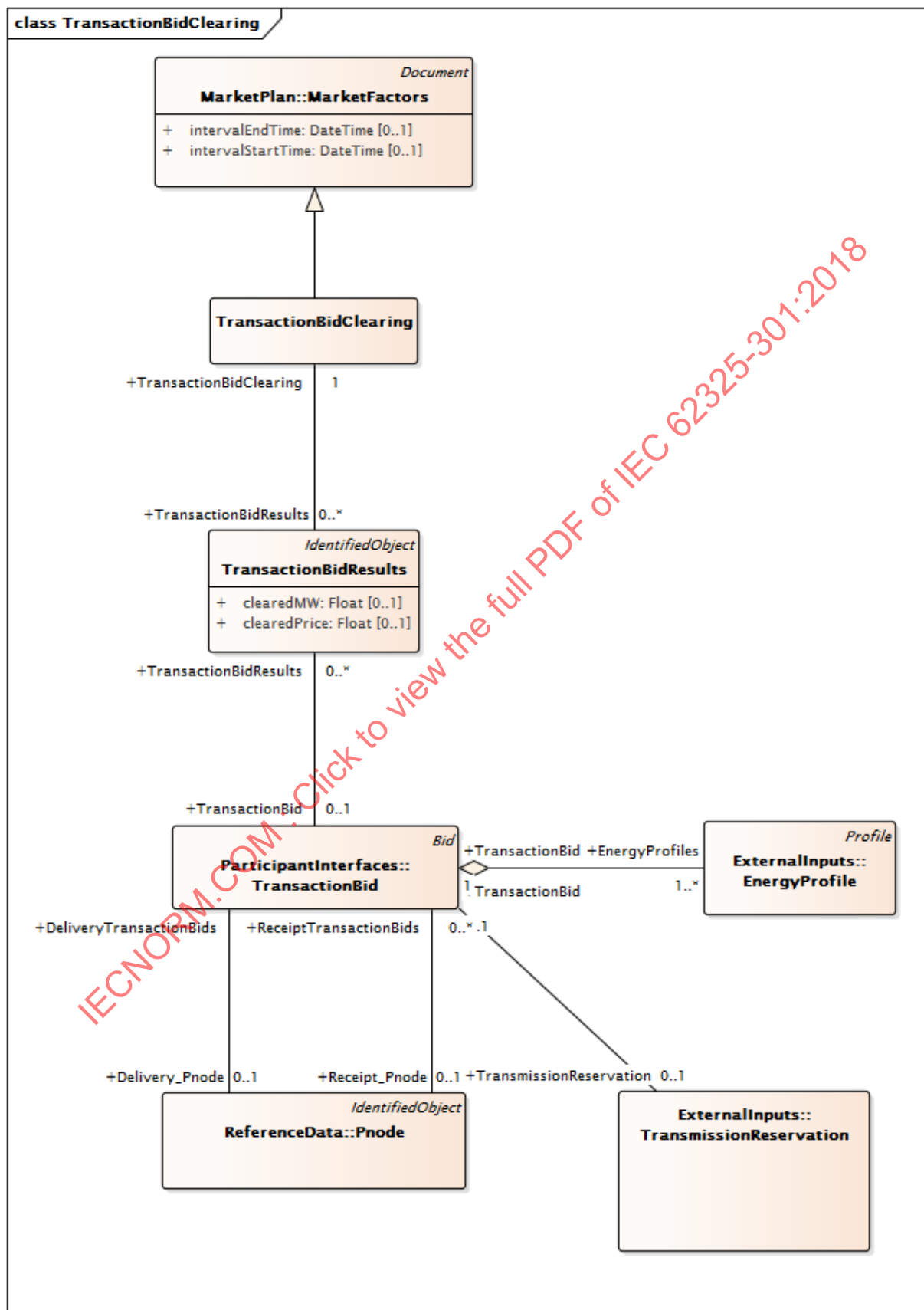
Figure 51: Shows the classes and relationships used to model the results of the market clearing of ancillary services at the level of a region of the market. The model includes results at the level of specific ancillary service products by means of the class MarketProduct and association to MarketRegionResults.



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Figure 52: Shows the classes and relationships used to model the results of the market clearing with more emphasis on the ResourceAwardInstruction. The main class of this diagram is the ResourceAwardInstruction which models the details of the award to the resource including the active power, the locational marginal price (LMP) and along with its

energy, congestion and cost components. the resource model includes RegisteredGenerator, RegisteredLoad and RegisteredInterTie as subclasses.



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Figure 53 – Class diagram MarketResults::TransactionBidClearing

Figure 53: Shows the classes and relationships used to model the results of the market clearing with more emphasis on Transaction Results. The model includes TransactionBid class and its relationship to Point of Delivery and Point of Receipt Pnodes.

6.5.6.3.2 AncillaryServiceClearing

Model of results of market clearing with respect to Ancillary Service products.

Table 240 shows all attributes of AncillaryServiceClearing.

Table 240 – Attributes of MarketResults::AncillaryServiceClearing

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 241 shows all association ends of AncillaryServiceClearing with other classes.

Table 241 – Association ends of MarketResults::AncillaryServiceClearing with other classes

mult from	name	mult to	type	description
0..1	MarketRegionResults	1..*	MarketRegionResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.3 BillDeterminant

Models various charges to support billing and settlement.

Table 242 shows all attributes of BillDeterminant.

Table 242 – Attributes of MarketResults::BillDeterminant

name	mult	type	description
calculationLevel	0..1	String	Level in charge calculation order.
configVersion	0..1	String	The version of configuration of calculation logic in the settlement.
deleteStatus	0..1	String	
effectiveDate	0..1	DateTime	
exception	0..1	String	
factor	0..1	String	
frequency	0..1	String	
numberInterval	0..1	Integer	Number of intervals of bill determinant in trade day, e.g. 300 for five minute intervals.
offset	0..1	String	
precisionLevel	0..1	String	The level of precision in the current value.
primaryYN	0..1	String	
referenceFlag	0..1	String	
reportable	0..1	String	
roundOff	0..1	String	
source	0..1	String	
terminationDate	0..1	DateTime	
unitOfMeasure	0..1	String	The UOM for the current value of the Bill Determinant.
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 243 shows all association ends of BillDeterminant with other classes.

Table 243 – Association ends of MarketResults::BillDeterminant with other classes

mult from	name	mult to	type	description
0..*	MktUserAttribute	0..*	MktUserAttribute	
0..1	ChargeProfileData	0..*	ChargeProfileData	
0..*	ChargeComponents	0..*	ChargeComponent	A BillDeterminant can have 0-n ChargeComponent and a ChargeComponent can associate to 0-n BillDeterminant.
0..1	ChargeProfile	0..1	ChargeProfile	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.4 ChargeProfile

A type of profile for financial charges.

Table 244 shows all attributes of ChargeProfile.

Table 244 – Attributes of MarketResults::ChargeProfile

name	mult	type	description
type	0..1	String	The type of profile. It could be amount, price, or quantity.
frequency	0..1	String	The calculation frequency, daily or monthly.
numberInterval	0..1	Integer	The number of intervals in the profile data.
unitOfMeasure	0..1	String	The unit of measure applied to the value attribute of the profile data.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 245 shows all association ends of ChargeProfile with other classes.

Table 245 – Association ends of MarketResults::ChargeProfile with other classes

mult from	name	mult to	type	description
0..1	BillDeterminant	0..1	BillDeterminant	
0..1	ChargeProfileData	0..*	ChargeProfileData	
0..*	PassThroughBill	0..1	PassThroughBill	
0..*	Bid	0..1	Bid	
0..*	ProfileDatas	0..*	ProfileData	inherited from: Profile
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.5 ChargeProfileData root class

Model of various charges associated with an energy profile to support billing and settlement.

Table 246 shows all attributes of ChargeProfileData.

Table 246 – Attributes of MarketResults::ChargeProfileData

name	mult	type	description
sequence	0..1	Integer	The sequence number of the profile.
timeStamp	0..1	DateTime	The date and time of an interval.
value	0..1	Float	The value of an interval given a profile type (amount, price, or quantity), subject to the UOM.

Table 247 shows all association ends of ChargeProfileData with other classes.

Table 247 – Association ends of MarketResults::ChargeProfileData with other classes

mult from	name	mult to	type	description
0..*	BillDeterminant	0..1	BillDeterminant	
0..*	ChargeProfile	0..1	ChargeProfile	

6.5.6.3.6 CommitmentClearing

Models results of market clearing which call for commitment of units.

Table 248 shows all attributes of CommitmentClearing.

Table 248 – Attributes of MarketResults::CommitmentClearing

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 249 shows all association ends of CommitmentClearing with other classes.

Table 249 – Association ends of MarketResults::CommitmentClearing with other classes

mult from	name	mult to	type	description
1..*	Commitments	1..*	Commitments	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.7 Commitments root class

Provides the necessary information (on a resource basis) to capture the Startup/Shutdown commitment results. This information is relevant to all markets.

Table 250 shows all attributes of Commitments.

Table 250 – Attributes of MarketResults::Commitments

name	mult	type	description
commitmentType	0..1	CommitmentType	the type of UC status (self commitment, ISO commitment, or SCUC commitment)
instructionCost	0..1	Float	Total cost associated with changing the status of the resource.
instructionType	0..1	AutomaticDisplnstTypeC ommitment	Indicator of either a Start-Up or a Shut-Down.
intervalEndTime	0..1	DateTime	End time for the commitment period. This will be on an interval boundary.
intervalStartTime	0..1	DateTime	Start time for the commitment period. This will be on an interval boundary.
minStatusChangeTime	0..1	Integer	SCUC commitment period start-up time. Calculated start up time based on the StartUpTimeCurve provided with the Bid. This is a combination of StartUp time bid and Unit down time. Units is minutes
noLoadCost	0..1	Float	Unit no load cost in case of energy commodity
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
updateUser	0..1	String	

Table 251 shows all association ends of Commitments with other classes.

Table 251 – Association ends of MarketResults::Commitments with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	1..1	RegisteredResource	
1..*	CommitmentClearing	1..*	CommitmentClearing	

6.5.6.3.8 CommodityPrice root class

The CommodityPrice class is used to define the price of a commodity during a given time interval. The interval may be long, e.g. a year, or very short, e.g. 5 minutes. There will be many instances of the CommodityPrice class for each instance of the CommodityDefinition to which it is associated. Note that there may be more than once price associated with a given interval and these variances are described by the association (or associations) with the PriceDescriptor class.

Table 252 shows all attributes of CommodityPrice.

Table 252 – Attributes of MarketResults::CommodityPrice

name	mult	type	description
timeIntervalPeriod	0..1	DateTimeInterval	The time interval over which the CommodityPrice is valid, using the standard conventions associated with the DateTimeInterval class.
value	0..1	Float	The price of the Commodity, expressed as a floating point value with the currency and unit of measure defined in the associated CommodityDefinition class.

Table 253 shows all association ends of CommodityPrice with other classes.

Table 253 – Association ends of MarketResults::CommodityPrice with other classes

mult from	name	mult to	type	description
1..*	CommodityDefinition	1..1	CommodityDefinition	
1..*	PriceDescriptor	1..1	PriceDescriptor	
0..*	PnodeClearing	0..1	PnodeClearing	

6.5.6.3.9 ConstraintClearing

Groups all items associated with Binding Constraints and Constraint Violations per interval and market.

Table 254 shows all attributes of ConstraintClearing.

Table 254 – Attributes of MarketResults::ConstraintClearing

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 255 shows all association ends of ConstraintClearing with other classes.

Table 255 – Association ends of MarketResults::ConstraintClearing with other classes

mult from	name	mult to	type	description
0..1	ConstraintResults	0..*	ConstraintResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document

mult from	name	mult to	type	description
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.10 ConstraintResults

Provides the Market results for the constraint processing for either the DAM or RTM. The data includes the constraint type (binding or violated), the solved value for the constraint, and the associated shadow price.

Table 256 shows all attributes of ConstraintResults.

Table 256 – Attributes of MarketResults::ConstraintResults

name	mult	type	description
baseFlow	0..1	Float	Branch base Power Flow.
BGLimit	0..1	Float	This value is determined in DA and RTM. The SCUC optimization ensures that the MW flow on the Branch Group will not exceed this limit in the relevant direction.
BGTRResCap	0..1	Float	Branch Group TR Reservation Capacity – This value is determined in DA and RTM. It is the amount of spare transmission capacity that is left for the TR holder to use.
bindingLimit	0..1	Float	MW Limit.
clearedValue	0..1	Float	Cleared MW.
competitivePathConstraint	0..1	YesNo	Non-competitive path constraint Flag"(Y/N) indicating whether the shadow price on a non-competitive path was non-zero.
constraintType	0..1	ResultsConstraintType	Type of constraint.
limitFlag	0..1	ConstraintLimitType	Limit flag ('Maximum', 'Minimum').
optimizationFlag	0..1	YesNo	Included in optimization Y/N.
overloadMW	0..1	Float	Transmission overload MW.
percentMW	0..1	Float	Actual MW flow as percent of limit.
shadowPrice	0..1	Float	Shadow Price (\$/MW) for the commodity. Shadow price for the corresponding constraint.
updateTimeStamp	0..1	DateTime	Update time stamp.
updateType	0..1	MQSCHGType	MQS change type.
updateUser	0..1	String	Updated user.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 257 shows all association ends of ConstraintResults with other classes.

Table 257 – Association ends of MarketResults::ConstraintResults with other classes

mult from	name	mult to	type	description
0..*	MktContingency	1..1	MktContingency	
0..*	ConstraintClearing	0..1	ConstraintClearing	
1..*	Flowgate	1..1	Flowgate	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.11 DopInstruction root class

Provides the necessary information (on a resource basis) to capture the Dispatch Operating Point (DOP) results on a Dispatch interval. This information is only relevant to the RT interval market.

Table 258 shows all attributes of DopInstruction.

Table 258 – Attributes of MarketResults::DopInstruction

name	mult	type	description
mwDOP	0..1	ActivePower	Dispatched Operating Point (MW)
timestampDOP	0..1	DateTime	DOP time stamp
plotPriority	0..1	Integer	A value used to establish priority of the DOP when plotting. This is only applicable when two DOPs exist for the same time, but with different MW values. E.g. when indicating a step in the curve. Its used to determine if the curve steps up or down.
runIndicatorDOP	0..1	YesNo	Indication of DOP validity. Shows the DOP is calculated from the latest run (YES). A NO indicator shows that the DOP is copied from a previous execution. Up to 2 intervals can be missed.
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	

Table 259 shows all association ends of DopInstruction with other classes.

Table 259 – Association ends of MarketResults::DopInstruction with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	InstructionClearingDOP	1..*	InstructionClearingDOP	

6.5.6.3.12 DotInstruction root class

Provides the necessary information (on a resource basis) to capture the Dispatch Operating Target (DOT) results on a Dispatch interval. This information is only relevant to the RT interval market.

Table 260 shows all attributes of DotInstruction.

Table 260 – Attributes of MarketResults::DotInstruction

name	mult	type	description
actualRampRate	0..1	Float	Actual ramp rate.
compliantIndicator	0..1	YesNo	Flag indicating whether or not the resource was in compliance with the instruction (plus/minus 10%). Directs if a unit is allowed to set the price (ex-post pricing).
DOT	0..1	Float	Dispatch operating target value.
economicMaxOverride	0..1	Float	Economic Max Limit override for unit, this value is null, if it is not, this value overrides the Energy column value. Allows dispatcher to override the unit's energy value.
expectedEnergy	0..1	Float	Expected energy.
generatorPerformanceDegree	0..1	Float	The Degree of Generator Performance (DGP) used for the unit. Measure of how a generator responds to raise /lower signals. Calculated every five minutes.
hourAheadSchedEnergy	0..1	Float	HASP results.
hourlySchedule	0..1	Float	Hourly Schedule (DA Energy Schedule).
instructionTime	0..1	DateTime	The date/time for the instruction.
maximumEmergencyInd	0..1	Boolean	True if maximum emergency limit activated; false otherwise. If unit is requested to move up to its max emergency limit., this flag is set to true.
meterLoadFollowing	0..1	Float	Meter Sub System Load Following.
nonRampRestrictedMW	0..1	Float	Desired MW that is not ramp restricted. If no ramp rate limit existed for the unit, this is the MW value that the unit was requested to move to.
nonSpinReserve	0..1	Float	Non Spin Reserve used to procure energy.
previousDOTTimeStamp	0..1	DateTime	Timestamp when the previous DOT value was issued.
rampRateLimit	0..1	Float	The ramp rate limit for the unit in MWs per minute. Participant bidding data.
regulationStatus	0..1	YesNo	Regulation Status (Yes/No).
spinReserve	0..1	Float	Spin Reserve used to procure energy.
standardRampEnergy	0..1	Float	Standard ramping energy (MWH).
supplementalEnergy	0..1	Float	Supplemental Energy procure by Real Time Dispatch.
unitStatus	0..1	Integer	Output results from the case identifying the reason the unit was committed by the software.

Table 261 shows all association ends of DotInstruction with other classes.

Table 261 – Association ends of MarketResults::DotInstruction with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	InstructionClearingDOT	1..*	InstructionClearingDOT	

6.5.6.3.13 ExPostLoss

Model of ex-post calculation of MW losses.

Table 262 shows all attributes of ExPostLoss.

Table 262 – Attributes of MarketResults::ExPostLoss

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 263 shows all association ends of ExPostLoss with other classes.

Table 263 – Association ends of MarketResults::ExPostLoss with other classes

mult from	name	mult to	type	description
1..1	ExPostLossResults	0..*	ExPostLossResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document

mult from	name	mult to	type	description
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.14 ExPostLossResults root class

Model results of ex-post calculation of MW losses. Summarizes loss in two categories losses on the the extra high voltage transmission and total losses. Calculated for each subcontrol area.

Table 264 shows all attributes of ExPostLossResults.

Table 264 – Attributes of MarketResults::ExPostLossResults

name	mult	type	description
totalLossMW	0..1	Float	Total MW losses in the company Attribute Usage: Information purposes – Output of LPA engine.
ehvLossMW	0..1	Float	EHV MW losses in the company Attribute Usage: Information purposes – Output of LPA engine.

Table 265 shows all association ends of ExPostLossResults with other classes.

Table 265 – Association ends of MarketResults::ExPostLossResults with other classes

mult from	name	mult to	type	description
0..*	ExPostLoss	1..1	ExPostLoss	
0..*	SubControlArea	0..1	SubControlArea	

6.5.6.3.15 ExPostMarketRegion

Model of ex-post calculation of cleared MW on a regional basis.

Table 266 shows all attributes of ExPostMarketRegion.

Table 266 – Attributes of MarketResults::ExPostMarketRegion

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document

name	mult	type	description
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 267 shows all association ends of ExPostMarketRegion with other classes.

Table 267 – Association ends of MarketResults::ExPostMarketRegion with other classes

mult from	name	mult to	type	description
1..1	ExPostMarketRegionResults	0..1	ExPostMarketRegionResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.16 ExPostMarketRegionResults root class

Model of expost calculation of cleared MW on a region basis. Includes cleared price.

Table 268 shows all attributes of ExPostMarketRegionResults.

Table 268 – Attributes of MarketResults::ExPostMarketRegionResults

name	mult	type	description
exPostClearedPrice	0..1	Float	

Table 269 shows all association ends of ExPostMarketRegionResults with other classes.

Table 269 – Association ends of MarketResults::ExPostMarketRegionResults with other classes

mult from	name	mult to	type	description
0..1	ExPostMarketRegion	1..1	ExPostMarketRegion	
0..*	MarketRegion	1..1	MarketRegion	

6.5.6.3.17 ExPostPricing

Model of ex-post pricing of nodes.

Table 270 shows all attributes of ExPostPricing.

Table 270 – Attributes of MarketResults::ExPostPricing

name	mult	type	description
energyPrice	0..1	Float	market energy price
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 271 shows all association ends of ExPostPricing with other classes.

Table 271 – Association ends of MarketResults::ExPostPricing with other classes

mult from	name	mult to	type	description
1..1	ExPostResults	0..*	ExPostPricingResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document

mult from	name	mult to	type	description
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.18 ExPostPricingResults root class

Model of ex-post pricing of nodes. Includes LMP information, pnode based.

Table 272 shows all attributes of ExPostPricingResults.

Table 272 – Attributes of MarketResults::ExPostPricingResults

name	mult	type	description
congestLMP	0..1	Float	Congestion component of Location Marginal Price (LMP) in monetary units per MW; congestion component of the hourly LMP at a specific pricing node Attribute Usage: Result of the Security, Pricing, and Dispatch (SPD)/Simultaneous Feasibility Test (SFT) software and denotes the hourly congestion component of LMP for each pricing node.
lmp	0..1	Float	5 min weighted average LMP; the Location Marginal Price of the Pnode for which price calculation is carried out. Attribute Usage: 5 min weighted average LMP to be displayed on UI
lossLMP	0..1	Float	Loss component of Location Marginal Price (LMP) in monetary units per MW; loss component of the hourly LMP at a specific pricing node Attribute Usage: Result of the Security, Pricing, and Dispatch (SPD)/Simultaneous Feasibility Test (SFT) software and denotes the hourly loss component of LMP for each pricing node.

Table 273 shows all association ends of ExPostPricingResults with other classes.

Table 273 – Association ends of MarketResults::ExPostPricingResults with other classes

mult from	name	mult to	type	description
0..*	ExPostPricing	1..1	ExPostPricing	
0..*	Pnode	1..1	Pnode	

6.5.6.3.19 ExPostResource

Model of ex-post pricing of resources.

Table 274 shows all attributes of ExPostResource.

Table 274 – Attributes of MarketResults::ExPostResource

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 275 shows all association ends of ExPostResource with other classes.

Table 275 – Association ends of MarketResults::ExPostResource with other classes

mult from	name	mult to	type	description
1..1	ExPostResourceResults	0..*	ExPostResourceResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.20 ExPostResourceResults root class

Model of ex-post pricing of resources contains components of LMPs: energy, congestion, loss. Resource based.

Table 276 shows all attributes of ExPostResourceResults.

Table 276 – Attributes of MarketResults::ExPostResourceResults

name	mult	type	description
congestionLMP	0..1	Float	LMP component in USD (deprecated)
desiredMW	0..1	Float	Desired output of unit
dispatchRate	0..1	Float	Unit Dispatch rate from real time unit dispatch.
Imp	0..1	Float	LMP (Local Marginal Price) in USD at the equipment (deprecated)
lossLMP	0..1	Float	loss Imp (deprecated)
maxEconomicMW	0..1	Float	Economic Maximum MW
minEconomicMW	0..1	Float	Economic Minimum MW
resourceMW	0..1	Float	Current MW output of the equipment Attribute Usage: Information purposes – Information purposes – Output of LPA engine.
status	0..1	EquipmentStatusType	Status of equipment

Table 277 shows all association ends of ExPostResourceResults with other classes.

Table 277 – Association ends of MarketResults::ExPostResourceResults with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
0..*	ExPostResource	1..1	ExPostResource	

6.5.6.3.21 GeneralClearing

Model of clearing result of the market run at the market level. Identifies interval.

Table 278 shows all attributes of GeneralClearing.

Table 278 – Attributes of MarketResults::GeneralClearing

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document

name	mult	type	description
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 279 shows all association ends of GeneralClearing with other classes.

Table 279 – Association ends of MarketResults::GeneralClearing with other classes

mult from	name	mult to	type	description
0..1	GeneralClearingResults	0..*	GeneralClearingResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.22 GeneralClearingResults root class

Provides the adjusted load forecast value on a load forecast zone basis.

Table 280 shows all attributes of GeneralClearingResults.

Table 280 – Attributes of MarketResults::GeneralClearingResults

name	mult	type	description
loadForecast	0..1	ActivePower	Load Prediction/Forecast (MW), by Time Period (5', 10', 15')
totalLoad	0..1	Float	Amount of load in the control zone Attribute Usage: hourly load value for the specific area
totalNetInterchange	0..1	Float	Amount of interchange for the control zone Attribute Usage: hourly interchange value for the specific area

Table 281 shows all association ends of GeneralClearingResults with other classes.

Table 281 – Association ends of MarketResults::GeneralClearingResults with other classes

mult from	name	mult to	type	description
0..*	GeneralClearing	0..1	GeneralClearing	
0..*	SubControlArea	0..1	SubControlArea	

6.5.6.3.23 InstructionClearing

Model of market clearing, relating to commitment instructions. Identifies interval.

Table 282 shows all attributes of InstructionClearing.

Table 282 – Attributes of MarketResults::InstructionClearing

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 283 shows all association ends of InstructionClearing with other classes.

Table 283 – Association ends of MarketResults::InstructionClearing with other classes

mult from	name	mult to	type	description
0..1	ResourceDeploymentStatus	0..*	ResourceDeploymentStatus	
0..*	ActualDemandResponseEvent	0..1	DistributedResourceActualEvent	ActualDemandResponseEvents may exist that are not part of a coordinated MarketActualEvent associated to a Market. These ActualDemandResponseEvents can have many InstructionClearing Instructions for specified RegisteredResources or Distributed Energy Resource type of AggregateNodes.

mult from	name	mult to	type	description
1..*	Instructions	1..*	Instructions	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.24 InstructionClearingDOP

Model of market clearing, related to Dispatch Operating Point. Identifies interval.

Table 284 shows all attributes of InstructionClearingDOP.

Table 284 – Attributes of MarketResults::InstructionClearingDOP

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 285 shows all association ends of InstructionClearingDOP with other classes.

Table 285 – Association ends of MarketResults::InstructionClearingDOP with other classes

mult from	name	mult to	type	description
1..*	DopInstruction	1..*	DopInstruction	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.25 InstructionClearingDOT

Model of market clearing, related to Dispatch Operating Target (model of anticipatory dispatch). Identifies interval.

Table 286 shows all attributes of InstructionClearingDOT.

Table 286 – Attributes of MarketResults::InstructionClearingDOT

name	mult	type	description
contingencyActive	0..1	YesNo	Indication that the system is currently operating in a contingency mode.
dispatchMode	0..1	AutomaticDispatchMode	
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 287 shows all association ends of InstructionClearingDOT with other classes.

Table 287 – Association ends of MarketResults::InstructionClearingDOT with other classes

mult from	name	mult to	type	description
1..*	DotInstruction	1..*	DotInstruction	
0..*	DemandResponseActualEvent	0..1	DistributedResourceActualEvent	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.26 Instructions root class

Provides the necessary information (on a resource basis) to capture the Startup/Shutdown instruction results. This information is relevant to the DA Market (RUC only) as well as the RT Market (HASP, Pre-dispatch, and Interval).

Table 288 shows all attributes of Instructions.

Table 288 – Attributes of MarketResults::Instructions

name	mult	type	description
bindingDOD	0..1	Float	Binding dispatch operating delta provides a relative delta to be applied. Typically used in demand response instructions. The bindingDOD instructions are cumulative; in other words a second DOD instruction does not replace the previous DOD, instead the second DOD adds to the previous DODs.
bindingDOT	0..1	Float	
bindingInstruction	0..1	YesNo	
instructionCost	0..1	Float	Total cost associated with changing the status of the resource.
instructionSource	0..1	MQSInstructionSource	instruction source for market quality results (INS, ACT)
instructionStartTime	0..1	DateTime	Time the resource should be at Pmin (for start ups). Time the resource is off line.
instructionType	0..1	AutomaticDisplnstTypeCommitment	Indicator of either a Start-Up or a Shut-Down.
manuallyBlocked	0..1	YesNo	Manually Blocked Indicator (Yes/No). The instruction has been blocked by an Operator.
minStatusChangeTime	0..1	Integer	Minimum start up time required to bring the unit online (minutes).

name	mult	type	description
			SCUC commitment period start-up time. Calculated start up time based on the StartUpTimeCurve provided with the Bid. This is a combination of StartUp time bid and Unit down time. Units is minutes
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
updateUser	0..1	String	

Table 289 shows all association ends of Instructions with other classes.

Table 289 – Association ends of MarketResults::Instructions with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	1..1	RegisteredResource	
1..*	InstructionClearing	1..*	InstructionClearing	
0..*	AggregateNode	0..1	AggregateNode	

6.5.6.3.27 LoadFollowingOperatorInput root class

Model of load following capabilities that are entered by operators on a temporary basis. Related to Registered Resources in Metered Subsystems.

Table 290 shows all attributes of LoadFollowingOperatorInput.

Table 290 – Attributes of MarketResults::LoadFollowingOperatorInput

name	mult	type	description
dataEntryTimeStamp	0..1	DateTime	Time the data entry was performed
tempLoadFollowingUpManualCap	0..1	Float	temporarily manually entered LFU capacity.
tempLoadFollowingDownManualCap	0..1	Float	temporarily manually entered LFD capacity
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	

Table 291 shows all association ends of LoadFollowingOperatorInput with other classes.

Table 291 – Association ends of MarketResults::LoadFollowingOperatorInput with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	

6.5.6.3.28 LossClearing

RT only and is published on 5 minute intervals for the previous RT time interval results.

Table 292 shows all attributes of LossClearing.

Table 292 – Attributes of MarketResults::LossClearing

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 293 shows all association ends of LossClearing with other classes.

Table 293 – Association ends of MarketResults::LossClearing with other classes

mult from	name	mult to	type	description
0..1	LossClearingResults	0..*	LossClearingResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.29 LossClearingResults root class

Provides the MW loss for RUC Zones, subcontrol areas, and the total loss.

Table 294 shows all attributes of LossClearingResults.

Table 294 – Attributes of MarketResults::LossClearingResults

name	mult	type	description
lossMW	0..1	Float	

Table 295 shows all association ends of LossClearingResults with other classes.

Table 295 – Association ends of MarketResults::LossClearingResults with other classes

mult from	name	mult to	type	description
1..*	SubControlArea	0..1	SubControlArea	
0..*	LossClearing	0..1	LossClearing	
0..*	HostControlArea	0..1	HostControlArea	
0..*	RUCZone	0..1	RUCZone	

6.5.6.3.30 MPMClearing

Model of results of Market Power tests, and possible mitigation. Interval based.

Table 296 shows all attributes of MPMClearing.

Table 296 – Attributes of MarketResults::MPMClearing

name	mult	type	description
LMPMFinalFlag	0..1	YesNo	
SMPMFinalFlag	0..1	YesNo	
mitigationOccuredFlag	0..1	YesNo	
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 297 shows all association ends of MPMClearing with other classes.

Table 297 – Association ends of MarketResults::MPMClearing with other classes

mult from	name	mult to	type	description
0..1	MPMTestResults	0..*	MPMTestResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.31 MPMResourceStatus root class

Model of results of Market Power tests, gives status of resource for the associated interval.

Table 298 shows all attributes of MPMResourceStatus.

Table 298 – Attributes of MarketResults::MPMResourceStatus

name	mult	type	description
resourceStatus	0..1	String	Interval Test Status 'N' – not applicable

Table 299 shows all association ends of MPMResourceStatus with other classes.

Table 299 – Association ends of MarketResults::MPMResourceStatus with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
0..*	MPMTestCategory	1..1	MPMTestCategory	
0..*	MitigatedBidClearing	1..*	MitigatedBidClearing	

6.5.6.3.32 MPMTestResults root class

Provides the outcome and margin percent (as appropriate) result data for the MPM tests. There are relationships to Zone for Designated Congestion Area Tests, CurveSchedData for bid segment tests, to the SubControlArea for the system wide level tests, and Pnodes for the LMPM impact tests.

Table 300 shows all attributes of MPMTestResults.

Table 300 – Attributes of MarketResults::MPMTestResults

name	mult	type	description
outcome	0..1	MPMTestOutcome	The results of the test. For the Price, Impact, and Conduct tests, typical values are NA, Pass, Fail, Disable, or Skip.
marginPercent	0..1	PerCent	Used to show the Margin % result of the Impact test

Table 301 shows all association ends of MPMTestResults with other classes.

Table 301 – Association ends of MarketResults::MPMTestResults with other classes

mult from	name	mult to	type	description
0..*	MPMClearing	0..1	MPMClearing	
1..*	AggregatedPnode	1..1	AggregatedPnode	
0..*	MPMTestCategory	1..1	MPMTestCategory	

6.5.6.3.33 MarketRegionResults root class

Provides all Region Ancillary Service results for the DA and RT markets. The specific data is commodity type (Regulation Up, Regulation Down, Spinning Reserve, Non-spinning Reserve, or Total Up reserves) based for the cleared MW, cleared price, and total capacity required for the region.

Table 302 shows all attributes of MarketRegionResults.

Table 302 – Attributes of MarketResults::MarketRegionResults

name	mult	type	description
clearedMW	0..1	Float	Cleared generation Value in MW. For AS, this value is clearedMW = AS Total. For AS, clearedMW – selfScheduleMW = AS Procured
clearedPrice	0..1	Float	Marginal Price (\$/MW) for the commodity (Energy, Regulation Up, Regulation Down, Spinning Reserve, or Non-spinning reserve) based on the pricing run.
dispatchCtMW	0..1	Float	Dispatchable MW for Combustion units.
dispatchHydroMW	0..1	Float	Dispatchable MW for Hydro units.
dispatchRate	0..1	Float	Dispatch rate in MW/minutes.
dispatchSteamMW	0..1	Float	Dispatchable MW for Steam units.
imbalanceEnergyBias	0..1	Float	Imbalance Energy Bias (MW) by Time Period (5' only)
limitFlag	0..1	ResourceLimitIndicator	Locational AS Flags indicating whether the Upper or Lower Bound limit of the AS regional procurement is binding
lumpyIndicator	0..1	YesNo	The "Lumpy Flag"(Y/N) indicates whether the resource that sets the price is a lumpy generator by hour over the time horizon. Only applicable for the Day Ahead Market
maxSufficiencyIndex	0..1	Float	Region requirement maximum limit
minSufficiencyIndex	0..1	Float	Region requirement minimum limit
reqMaxMW	0..1	Float	Region requirement maximum limit

name	mult	type	description
reqMinMW	0..1	Float	Region requirement minimum limit
selfScheduleMW	0..1	Float	Aof AS, selfScheduleMW = AS Self-Provided

Table 303 shows all association ends of MarketRegionResults with other classes.

**Table 303 – Association ends of MarketResults::
MarketRegionResults with other classes**

mult from	name	mult to	type	description
0..1	MarketProduct	0..1	MarketProduct	
1..*	AncillaryServiceClearing	0..1	AncillaryServiceClearing	
1..*	MarketRegion	1..1	MarketRegion	

6.5.6.3.34 MarketResults root class

This class holds elements that are single values for the entire market time horizon. That is, for the Day Ahead market, there is 1 value for each element, not hourly based. Is a summary of the market run.

Table 304 shows all attributes of MarketResults.

Table 304 – Attributes of MarketResults::MarketResults

name	mult	type	description
startUpCost	0..1	Float	Total Start-up Cost (\$) over the time horizon
minimumLoadCost	0..1	Float	Total Minimum Load Cost (\$) over the time horizon
contingentOperatingRes Avail	0..1	YesNo	Global Contingent Operating Reserve Availability Indicator (Yes/No)
energyCost	0..1	Float	Total Energy Cost (\$) over the time horizon
totalCost	0..1	Float	Total Cost (Energy + AS) cost (\$) by over the time horizon
ancillarySvcCost	0..1	Float	Total AS Cost (i.e., payment) (\$) over the time horizon
totalRucCost	0..1	Float	The total RUC capacity cost for this interval

Table 305 shows all association ends of MarketResults with other classes.

Table 305 – Association ends of MarketResults::MarketResults with other classes

mult from	name	mult to	type	description
0..1	EnergyMarket	1..1	EnergyMarket	

6.5.6.3.35 MarketStatement

A statement is a roll up of statement line items. Each statement along with its line items provide the details of specific charges at any given time. Used by Billing and Settlement.

Table 306 shows all attributes of MarketStatement.

Table 306 – Attributes of MarketResults::MarketStatement

name	mult	type	description
tradeDate	0..1	DateTime	The date of which Settlement is run.
referenceNumber	0..1	String	The version number of previous statement (in the case of true up).
start	0..1	DateTime	The start of a bill period.
end	0..1	DateTime	The end of a bill period.
transactionDate	0..1	DateTime	The date of which this statement is issued.
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 307 shows all association ends of MarketStatement with other classes.

Table 307 – Association ends of MarketResults::MarketStatement with other classes

mult from	name	mult to	type	description
1..1	MarketStatementLineItem	0..*	MarketStatementLineItem	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.36 MarketStatementLineItem

An individual line item on an ISO settlement statement.

Table 308 shows all attributes of MarketStatementLineItem.

Table 308 – Attributes of MarketResults::MarketStatementLineItem

name	mult	type	description
currentAmount	0..1	Float	Current settlement amount.
currentISOAmount	0..1	Float	Current ISO settlement amount.
currentISOQuantity	0..1	Float	Current ISO settlement quantity.
currentPrice	0..1	Float	Current settlement price.
currentQuantity	0..1	Float	Current settlement quantity, subject to the UOM.
intervalDate	0..1	DateTime	The date of which the settlement is run.
intervalNumber	0..1	String	The number of intervals.
netAmount	0..1	Float	Net settlement amount.
netISOAmount	0..1	Float	Net ISO settlement amount.
netISOQuantity	0..1	Float	Net ISO settlement quantity.
netPrice	0..1	Float	Net settlement price.
netQuantity	0..1	Float	Net settlement quantity, subject to the UOM.
previousAmount	0..1	Float	Previous settlement amount.
previousISOAmount	0..1	Float	Previous ISO settlement amount.
previousISOQuantity	0..1	Float	Previous ISO settlement quantity.
previousPrice	0..1	Float	Previous settlement price.
previousQuantity	0..1	Float	Previous settlement quantity, subject to the UOM.
quantityUOM	0..1	String	The unit of measure for the quantity element of the line item.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 309 shows all association ends of MarketStatementLineItem with other classes.

Table 309 – Association ends of MarketResults::MarketStatementLineItem with other classes

mult from	name	mult to	type	description
0..*	MktUserAttribute	0..*	MktUserAttribute	
0..*	MarketStatement	1..1	MarketStatement	
0..*	ContainerMarketStatementLineItem	0..1	MarketStatementLineItem	
0..1	PassThroughBill	0..1	PassThroughBill	
0..1	ComponentMarketStatementLineItem	0..*	MarketStatementLineItem	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.37 MitigatedBid

Mitigated bid results posted for a given settlement period.

Table 310 shows all attributes of MitigatedBid.

Table 310 – Attributes of MarketResults::MitigatedBid

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 311 shows all association ends of MitigatedBid with other classes.

Table 311 – Association ends of MarketResults::MitigatedBid with other classes

mult from	name	mult to	type	description
0..*	Bid	0..1	Bid	
0..*	MitigatedBidClearing	1..*	MitigatedBidClearing	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.38 MitigatedBidClearing

Model of market power mitigation through reference or mitigated bids. Interval based.

Table 312 shows all attributes of MitigatedBidClearing.

Table 312 – Attributes of MarketResults::MitigatedBidClearing

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document

name	mult	type	description
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 313 shows all association ends of MitigatedBidClearing with other classes.

Table 313 – Association ends of MarketResults::MitigatedBidClearing with other classes

mult from	name	mult to	type	description
1..*	MPMResourceStatus	0..*	MPMResourceStatus	
1..*	MitigatedBid	0..*	MitigatedBid	
1..*	RMRDetermination	0..*	RMRDetermination	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.39 MitigatedBidSegment root class

Model of mitigated bid. Indicates segment of piece-wise linear bid, that has been mitigated.

Table 314 shows all attributes of MitigatedBidSegment.

Table 314 – Attributes of MarketResults::MitigatedBidSegment

name	mult	type	description
intervalStartTime	0..1	DateTime	
thresholdType	0..1	String	
segmentNumber	0..1	Integer	Mitigated Bid Segment Number
segmentMW	0..1	Float	Mitigated bid segment MW value

Table 315 shows all association ends of MitigatedBidSegment with other classes.

Table 315 – Association ends of MarketResults::MitigatedBidSegment with other classes

mult from	name	mult to	type	description
0..*	Bid	1..1	Bid	

6.5.6.3.40 PassThroughBill

Pass Through Bill is used for:

- 1) Two sided charge transactions with or without ISO involvement
- 2) Specific direct charges or payments that are calculated outside or provided directly to settlements
- 3) Specific charge bill determinants that are externally supplied and used in charge calculations

Table 316 shows all attributes of PassThroughBill.

Table 316 – Attributes of MarketResults::PassThroughBill

name	mult	type	description
adjustedAmount	0..1	Money	
amount	0..1	Money	The charge amount of the product/service.
billedTo	0..1	String	The company to which the PTB transaction is billed.
billEnd	0..1	DateTime	Bill period end date
billRunType	0..1	String	The settlement run type, for example: prelim, final, and rerun.
billStart	0..1	DateTime	Bill period start date
effectiveDate	0..1	DateTime	The effective date of the transaction
isDisputed	0..1	Boolean	Disputed transaction indicator
isProfiled	0..1	Boolean	A flag indicating whether there is a profile data associated with the PTB.
paidTo	0..1	String	The company to which the PTB transaction is paid.
previousEnd	0..1	DateTime	The previous bill period end date
previousStart	0..1	DateTime	The previous bill period start date
price	0..1	Money	The price of product/service.
productCode	0..1	String	The product identifier for determining the charge type of the transaction.
providedBy	0..1	String	The company by which the PTB transaction service is provided.
quantity	0..1	FloatQuantity	The product quantity.
serviceEnd	0..1	DateTime	The end date of service provided, if periodic.
serviceStart	0..1	DateTime	The start date of service provided, if periodic.
soldTo	0..1	String	The company to which the PTB transaction is sold.
taxAmount	0..1	Money	The tax on services taken.
timeZone	0..1	String	The time zone code
tradeDate	0..1	DateTime	The trade date
transactionDate	0..1	DateTime	The date the transaction occurs.

name	mult	type	description
transactionType	0..1	String	The type of transaction. For example, charge customer, bill customer, matching AR/AP, or bill determinant
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 317 shows all association ends of PassThroughBill with other classes.

Table 317 – Association ends of MarketResults::PassThroughBill with other classes

mult from	name	mult to	type	description
0..*	MktUserAttribute	0..*	MktUserAttribute	
0..1	MarketStatementLineItem	0..1	MarketStatementLineItem	
0..1	ChargeProfiles	0..*	ChargeProfile	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.41 PnodeClearing

Pricing node clearing results posted for a given settlement period.

Table 318 shows all attributes of PnodeClearing.

Table 318 – Attributes of MarketResults::PnodeClearing

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 319 shows all association ends of PnodeClearing with other classes.

Table 319 – Association ends of MarketResults::PnodeClearing with other classes

mult from	name	mult to	type	description
0..1	CommodityPrice	0..*	CommodityPrice	
0..1	PnodeResults	1..*	PnodeResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.42 PnodeResults root class

Provides the total price, the cost component, the loss component, and the congestion component for Pnodes for the forward and real time markets. There are several prices produced based on the run type (MPM, RUC, Pricing, or Scheduling/Dispatch).

Table 320 shows all attributes of PnodeResults.

Table 320 – Attributes of MarketResults::PnodeResults

name	mult	type	description
marginalClearingPrice	0..1	Float	Locational Marginal Price (LMP) (\$/MWh)
costLMP	0..1	Float	Cost component of Locational Marginal Pricing (LMP) in monetary units per MW.
lossLMP	0..1	Float	Loss component of Location Marginal Price (LMP) in monetary units per MW.
congestLMP	0..1	Float	Congestion component of Location Marginal Price (LMP) in monetary units per MW.
scheduledMW	0..1	Float	total MW schedule at the pnode
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	

Table 321 shows all association ends of PnodeResults with other classes.

Table 321 – Association ends of MarketResults::PnodeResults with other classes

mult from	name	mult to	type	description
1..*	PnodeClearing	0..1	PnodeClearing	
1..*	Pnode	0..1	Pnode	

6.5.6.3.43 PriceDescriptor root class

The price of a Commodity during a given time interval may change over time. For example, a price may be forecasted a year ahead, a month ahead, a day ahead, an hour ahead, and in real time; this is defined using the MarketType. Additionally a price may have one or more components. For example, a locational marginal energy price may be the arithmetic sum of the system price, the congestion price, and the loss price. The priceType enumeration is used determine if the price is the complete price (priceType="total") or one of potentially many constituent components.

Table 322 shows all attributes of PriceDescriptor.

Table 322 – Attributes of MarketResults::PriceDescriptor

name	mult	type	description
marketType	0..1	MarketType	The time frame for the price, using the standard conventions associated with the MarketType enumeration.
priceType	0..1	PriceTypeKind	The "kind" of price being described. In general, the priceType will either be "total" to signify that the price is the price paid to buy or sell the commodity, sometimes referred to as an "all-in" price, or one of potentially many components.

Table 323 shows all association ends of PriceDescriptor with other classes.

Table 323 – Association ends of MarketResults::PriceDescriptor with other classes

mult from	name	mult to	type	description
1..1	CommodityPrice	1..*	CommodityPrice	

6.5.6.3.44 RMRDetermination root class

Indicates whether unit is a reliability must run unit: required to be on to satisfy Grid Code Reliability criteria, load demand, or voltage support.

Table 324 shows all association ends of RMRDetermination with other classes.

Table 324 – Association ends of MarketResults::RMRDetermination with other classes

mult from	name	mult to	type	description
0..*	MitigatedBidClearing	1..*	MitigatedBidClearing	
0..*	Bid	0..1	Bid	

6.5.6.3.45 RMROperatorInput

RMR Operator's entry of the RMR requirement per market interval.

Table 325 shows all attributes of RMROperatorInput.

Table 325 – Attributes of MarketResults::RMROperatorInput

name	mult	type	description
manuallySchedRMRMw	0..1	Float	The lower of the original pre-dispatch or the AC run schedule (Also known as the RMR Requirement) becomes the pre-dispatch value.
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 326 shows all association ends of RMROperatorInput with other classes.

Table 326 – Association ends of MarketResults::RMROperatorInput with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.46 RUCAwardInstruction root class

This class models the information about the RUC awards.

Table 327 shows all attributes of RUCAwardInstruction.

Table 327 – Attributes of MarketResults::RUCAwardInstruction

name	mult	type	description
clearedPrice	0..1	Float	Marginal Price (\$/MW) for the commodity (Regulation Up, Regulation Down, Spinning Reserve, or Non-spinning reserve) for pricing run.
marketProductType	0..1	MarketProductType	major product type may include the following but not limited to: Energy Regulation Up Regulation Dn Spinning Reserve Non-Spinning Reserve Operating Reserve
RUCAward	0..1	Float	The RUC Award of a resource is the portion of the RUC Capacity that is not under RA or RMR contracts. The RUC Award of a resource is the portion of the RUC Capacity that is eligible for RUC Availability payment.
RUCCapacity	0..1	Float	The RUC Capacity of a resource is the difference between (i) the RUC Schedule and (ii) the higher of the DA Schedule and the Minimum Load.
RUCSchedule	0..1	Float	The RUC Schedule of a resource is its output level that balances the load forecast used in RUC. The RUC Schedule in RUC is similar to the DA Schedule in DAM.
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
updateUser	0..1	String	

Table 328 shows all association ends of RUCAwardInstruction with other classes.

Table 328 – Association ends of MarketResults::RUCAwardInstruction with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	ClearingResourceAward	1..*	ResourceAwardClearing	

6.5.6.3.47 ResourceAwardClearing

Models details of bid and offer market clearing. Class indicates whether a contingency is active and whether the automatic dispatching system is active for this interval of the market solution.

Table 329 shows all attributes of ResourceAwardClearing.

Table 329 – Attributes of MarketResults::ResourceAwardClearing

name	mult	type	description
dispatchMode	0..1	AutomaticDispatchMode	
contingencyActive	0..1	YesNo	Indication that the system is currently operating in a contingency mode.
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 330 shows all association ends of ResourceAwardClearing with other classes.

Table 330 – Association ends of MarketResults::ResourceAwardClearing with other classes

mult from	name	mult to	type	description
1..*	RUCAwardInstruction	1..*	RUCAwardInstruction	
1..*	ResourceAwardInstruction	1..*	ResourceAwardInstruction	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.48 ResourceAwardInstruction root class

Model of market results, instruction for resource. Contains details of award as attributes.

Table 331 shows all attributes of ResourceAwardInstruction.

Table 331 – Attributes of MarketResults::ResourceAwardInstruction

name	mult	type	description
awardMW	0..1	Float	For DA Energy: Not Applicable; For DA AS: DA AS market award; For RT Energy: Not Applicable; For RT AS: RT AS market award (excluding DA AS market or self-provision awards)
clearedMW	0..1	Float	For DA Energy: Total Schedule = DA market schedule + DA self-schedule award; For DA AS: DA Ancillary Service Awards = DA AS market award + DA AS self-provision award; For RT Energy: Total Schedule = RT market schedule + RT self-schedule award; For RT AS: RT Ancillary Service Awards = RT AS self-provision award + RT AS market award + DA AS market award + DA AS self-provision award;
clearedPrice	0..1	Float	Marginal Price (\$/MW) for the commodity (Regulation Up, Regulation Down, Spinning Reserve, or Non-spinning reserve) for pricing run.
congestLMP	0..1	Float	Congestion component of Location Marginal Price (LMP) in monetary units per MW.
costLMP	0..1	Float	Cost component of Locational Marginal Pricing (LMP) in monetary units per MW.
dispatcherAddedMW	0..1	Float	The tier2 mw added by dispatcher action Market results of the synchronized reserve market
economicMax	0..1	Float	Unit max output for dispatch; bid in economic maximum
economicMin	0..1	Float	Unit min output for dispatch; bid in economic minimum
effRegulationDownLimit	0..1	Float	Effective Regulation Down Limit (MW)
effRegulationUpLimit	0..1	Float	Effective Regulation Up Limit
lmp	0..1	Float	Locational marginal price value
lossLMP	0..1	Float	Loss component of Location Marginal Price (LMP) in monetary units per MW.
manuallyBlocked	0..1	YesNo	Indicates if an award was manually blocked (Y/N). Valid for Spinning and Non-spinning.
marginalResourceIndicator	0..1	YesNo	Indicator (Yes / No) that this resource set the price for this dispatch / schedule.
mustRunInd	0..1	Boolean	Identifies if the unit was set to must run by the market participant responsible for bidding in the unit
noLoadCost	0..1	Float	Unit no-load cost in case of energy commodity
optimalBidCost	0..1	Float	Optimal Bid cost
optimalBidPay	0..1	Float	Optimal Bid production payment based on LMP
optimalMargin	0..1	Float	Optimal Bid production margin

name	mult	type	description
overrideTimeStamp	0..1	DateTime	Time the manual data entry occurred.
overrideValue	0..1	Float	Provides the ability for the grid operator to override items, such as spin capacity requirements, prior to running the algorithm. This value is market product based (spin, non-spin, reg up, reg down, or RUC).
selfSchedMW	0..1	Float	For DA Energy: DA total self-schedule award; For DA AS: DA AS self-provision award; For RT Energy: RT total self-schedule award; For RT AS: RT AS self-provision award (excluding DA AS market or self-provision awards)
startUpCost	0..1	Float	Unit start up cost in case of energy commodity
status	0..1	String	In or out status of resource
totalRevenue	0..1	Float	Total bid revenue (startup_cost + no_load_cost + bid_pay)
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
updateUser	0..1	String	

Table 332 shows all association ends of ResourceAwardInstruction with other classes.

Table 332 – Association ends of MarketResults::ResourceAwardInstruction with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..1	SelfScheduleBreakdown	0..*	SelfScheduleBreakdown	
0..*	MarketProduct	1..1	MarketProduct	
1..*	ClearingResourceAward	1..*	ResourceAwardClearing	

6.5.6.3.49 ResourceClearing

Model of market results, including clearing result of resources. Associated with ResourceDispatchResults.

Table 333 shows all attributes of ResourceClearing.

Table 333 – Attributes of MarketResults::ResourceClearing

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document

name	mult	type	description
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 334 shows all association ends of ResourceClearing with other classes.

Table 334 – Association ends of MarketResults::ResourceClearing with other classes

mult from	name	mult to	type	description
0..1	ResourceDispatchResults	1..*	ResourceDispatchResults	
0..1	ResourceLoadFollowingInst	0..*	ResourceLoadFollowingInst	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.50 ResourceDeploymentStatus root class

Table 335 shows all attributes of ResourceDeploymentStatus.

Table 335 – Attributes of MarketResults::ResourceDeploymentStatus

name	mult	type	description
acceptComments	0..1	String	Comment to explain why the acceptance status. For example, to explain why a request is accepted only partially, instead of fully.
acceptStatus	0..1	String	Status of the resource for this deployment. Values include (full compliance, partial compliance, opt-out, etc.)
resourceResponseMW	0..1	Float	The MW amount the resource can contribute for this deployment. This is from the DR provider – as a response? Or actual? Does this belong in settlement? Discuss more.

Table 336 shows all association ends of ResourceDeploymentStatus with other classes.

Table 336 – Association ends of MarketResults::ResourceDeploymentStatus with other classes

mult from	name	mult to	type	description
0..*	InstructionClearing	0..1	InstructionClearing	

6.5.6.3.51 ResourceDispatchResults root class

The ResourceDispatchResults class provides market results that can be provided to a SC. The specific data provided consists of several indicators such as contingency flags, blocked start up, and RMR dispatch. It also provides the projected overall and the regulating status of the resource.

Table 337 shows all attributes of ResourceDispatchResults.

Table 337 – Attributes of MarketResults::ResourceDispatchResults

name	mult	type	description
blockedDispatch	0..1	String	Blocked Dispatch Indicator (Yes/No)
blockedPublishDOP	0..1	String	Block sending DOP to ADS (Y/N)
contingencyFlag	0..1	YesNo	Contingent Operating Reserve Indicator (Yes/No). Resource participating with AS capacity in contingency dispatch.
limitIndicator	0..1	String	indicate which limit is the constraints
lowerLimit	0..1	Float	resource energy ramping lower limit
maxRampRate	0..1	Float	maximum ramp rate
operatingLimitHigh	0..1	Float	The upper operating limit incorporating any derate used by the RTD for the Binding Interval.
operatingLimitLow	0..1	Float	The lower operating limit incorporating any derate used by the RTD for the Binding Interval.
penaltyDispatchIndicator	0..1	YesNo	Penalty Dispatch Indicator (Yes / No) indicating an un-economic adjustment.
regulatingLimitHigh	0..1	Float	The upper regulating limit incorporating any derate used by the RTD for the Binding Interval.
regulatingLimitLow	0..1	Float	The lower regulating limit incorporating any derate used by the RTD for the Binding Interval.
resourceStatus	0..1	String	Unit Commitment Status (On/Off/Starting)
totalSchedule	0..1	Float	Resource total upward schedule. total schedule = En + all AS per resource per interval
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
updateUser	0..1	String	
upperLimit	0..1	Float	resource energy ramping upper limit

Table 338 shows all association ends of ResourceDispatchResults with other classes.

Table 338 – Association ends of MarketResults::ResourceDispatchResults with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	ResourceClearing	0..1	ResourceClearing	

6.5.6.3.52 ResourceLoadFollowingInst root class

Model of market clearing results for resources that bid to follow load.

Table 339 shows all attributes of ResourceLoadFollowingInst.

Table 339 – Attributes of MarketResults::ResourceLoadFollowingInst

name	mult	type	description
instructionID	0..1	String	Unique instruction id per instruction, assigned by the SC and provided to ADS. ADS passes through.
intervalStartTime	0..1	DateTime	The start of the time interval for which requirement is defined.
calcLoadFollowingMW	0..1	Float	weighted average for RTPD and RTCD and same for RTID
dispWindowLowLimt	0..1	Float	
dispWindowHighLimt	0..1	Float	

Table 340 shows all association ends of ResourceLoadFollowingInst with other classes.

Table 340 – Association ends of MarketResults::ResourceLoadFollowingInst with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
0..*	ResourceClearing	0..1	ResourceClearing	

6.5.6.3.53 ResourcePerformanceEvaluation

Represents an the performance evaluation of a resource deployment. Every resource deployment may have many performance evaluations, using different evaluation metrics or algorithms, or produced by different evaluation authorities.

Table 341 shows all attributes of ResourcePerformanceEvaluation.

Table 341 – Attributes of MarketResults::ResourcePerformanceEvaluation

name	mult	type	description
effectiveEndTime	0..1	DateTime	
effectiveStartTime	0..1	DateTime	
evaluationDescription	0..1	String	Description of the performance evaluation, e.g. the rating classification used (any is allowed), why the evaluation was performed, anything that describes the demand response performance evaluation.
evaluationValue	0..1	String	The value of the performance. as a String, any rating scheme is supported (e.g. "1","2","3" or "low", "medium", "high"). The rating scheme is described in the performanceValueDescription attribute.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 342 shows all association ends of ResourcePerformanceEvaluation with other classes.

**Table 342 – Association ends of MarketResults::
ResourcePerformanceEvaluation with other classes**

mult from	name	mult to	type	description
1..1	ResourcePerformanceTimeSeriesFactors	0..*	ResourcePerformanceTimeSeriesFactor	
0..*	DemandResponseActualEvent	1..1	DistributedResourceActualEvent	
0..*	ResourcePerformanceGlobalFactor	0..*	ResourcePerformanceGlobalFactor	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.54 ResourcePerformanceGlobalFactor

Global factors are property/value pairs that are used to adjust resource performance values. Example include scale factors (e.g. scale a baseline up or down), adders (positive or negative), etc.

Table 343 shows all attributes of ResourcePerformanceGlobalFactor.

Table 343 – Attributes of MarketResults::ResourcePerformanceGlobalFactor

name	mult	type	description
factorDescription	0..1	String	Description (name) of the property (factor).
factorValue	0..1	String	Value of the property (factor).
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 344 shows all association ends of ResourcePerformanceGlobalFactor with other classes.

Table 344 – Association ends of MarketResults::ResourcePerformanceGlobalFactor with other classes

mult from	name	mult to	type	description
0..*	ResourcePerformanceEvaluation	0..*	ResourcePerformanceEvaluation	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.55 ResourcePerformanceRating

Rating of a resource for its demand response performance. e.g. given a set on monthly resource demand response performance evaluations, the resource may be rated with excellent, average, or poor performance for the sample set.

Table 345 shows all attributes of ResourcePerformanceRating.

Table 345 – Attributes of MarketResults::ResourcePerformanceRating

name	mult	type	description
effectiveEndTime	0..1	DateTime	starting date time that the rating is valid for
effectiveStartTime	0..1	DateTime	ending date time that the rating is valid for
ratingDescription	0..1	String	the resource's demand response rating description
ratingType	1..1	String	the type of performance rating, e.g. which market or product the rating is for
ratingValue	0..1	String	the resource's demand response rating
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 346 shows all association ends of ResourcePerformanceRating with other classes.

Table 346 – Association ends of MarketResults::ResourcePerformanceRating with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	1..1	RegisteredDistributedResource	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.56 ResourcePerformanceTimeSeriesFactor

Represents the performance of a resource as time series data for a specified time period, time interval, and evaluation criteria.

Table 347 shows all attributes of ResourcePerformanceTimeSeriesFactor.

Table 347 – Attributes of MarketResults::ResourcePerformanceTimeSeriesFactor

name	mult	type	description
timeSeriesDataType	0..1	String	Type of the time series data, e.g. baseline data, meter read data, computed performance data.
timeSeriesDescription	0..1	String	Optional description of the time series data, e.g. baseline data, meter read data, computed performance data.
value1Description	0..1	String	Description for the value1 contained within the TimeSeriesFactor.
value2Description	0..1	String	Description for the value2 contained within the TimeSeriesFactor.
endTime	0..1	DateTime	inherited from: RegularIntervalSchedule
timeStep	0..1	Seconds	inherited from: RegularIntervalSchedule
startTime	0..1	DateTime	inherited from: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value1Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value2Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 348 shows all association ends of ResourcePerformanceTimeSeriesFactor with other classes.

Table 348 – Association ends of MarketResults::ResourcePerformanceTimeSeriesFactor with other classes

mult from	name	mult to	type	description
0..*	ResourcePerformanceEvaluation	1..1	ResourcePerformanceEvaluation	
1..1	TimePoints	1..*	RegularTimePoint	inherited from: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.57 SelfScheduleBreakdown root class

Model of Self Schedules Results. Includes self schedule MW, and type of self schedule for each self schedule type included in total self schedule MW value found in ResourceAwardInstruction.

Table 349 shows all attributes of SelfScheduleBreakdown.

Table 349 – Attributes of MarketResults::SelfScheduleBreakdown

name	mult	type	description
selfSchedMW	0..1	Float	Cleared value for the specific self schedule type listed.
selfSchedType	0..1	SelfScheduleBreakdownType	Self schedule breakdown type.

Table 350 shows all association ends of SelfScheduleBreakdown with other classes.

Table 350 – Association ends of MarketResults::SelfScheduleBreakdown with other classes

mult from	name	mult to	type	description
0..*	ResourceAwardInstruction	1..1	ResourceAwardInstruction	

6.5.6.3.58 Settlement

Specifies a settlement run.

Table 351 shows all attributes of Settlement.

Table 351 – Attributes of MarketResults::Settlement

name	mult	type	description
tradeDate	0..1	DateTime	The trade date on which the settlement is run.
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 352 shows all association ends of Settlement with other classes.

Table 352 – Association ends of MarketResults::Settlement with other classes

mult from	name	mult to	type	description
0..*	MarketInvoiceLineItem	0..*	MarketInvoiceLineItem	
0..*	MarketLedgerEntry	0..*	MarketLedgerEntry	
0..*	EnergyMarket	0..1	EnergyMarket	
0..*	MajorChargeGroup	1..*	MajorChargeGroup	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.59 TransactionBidClearing

Contains the intervals relevant for the associated TransactionBidResults. For example, Day Ahead cleared results for the transaction bids for each interval of the market day.

Table 353 shows all attributes of TransactionBidClearing.

Table 353 – Attributes of MarketResults::TransactionBidClearing

name	mult	type	description
intervalEndTime	0..1	DateTime	inherited from: MarketFactors
intervalStartTime	0..1	DateTime	inherited from: MarketFactors
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 354 shows all association ends of TransactionBidClearing with other classes.

Table 354 – Association ends of MarketResults::TransactionBidClearing with other classes

mult from	name	mult to	type	description
1..1	TransactionBidResults	0..*	TransactionBidResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	inherited from: MarketFactors
0..*	Market	0..1	Market	inherited from: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.6.3.60 TransactionBidResults

Contains the cleared results for each TransactionBid submitted to and accepted by the market.

Table 355 shows all attributes of TransactionBidResults.

Table 355 – Attributes of MarketResults::TransactionBidResults

name	mult	type	description
clearedMW	0..1	Float	The market transaction megawatt
clearedPrice	0..1	Float	The price of the market transaction
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 356 shows all association ends of TransactionBidResults with other classes

Table 356 – Association ends of MarketResults::TransactionBidResults with other classes

mult from	name	mult to	type	description
0..*	TransactionBidClearing	1..1	TransactionBidClearing	
0..*	TransactionBid	0..1	TransactionBid	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.7 Package MktDomain

6.5.7.1 General

The MktDomain package is a data dictionary of quantities and units that define datatypes for attributes (properties) that may be used by any class in any other package within MarketOperations.

6.5.7.2 ActionType enumeration

Action type associated with an ActionRequest against a ParticipantInterfaces::Trade.

Table 357 shows all literals of ActionType.

Table 357 – Literals of MktDomain::ActionType

literal	value	description
CANCEL		Cancel a trade.

6.5.7.3 AnalogLimitType enumeration

Limit type specified for AnalogLimits.

Table 358 shows all literals of AnalogLimitType.

Table 358 – Literals of MktDomain::AnalogLimitType

literal	value	description
BranchMediumTerm		Branch Medium Term Limit
BranchLongTerm		Branch Long Term Limit
BranchShortTerm		Branch Short Term Limit
VoltageHigh		Voltage High Limit
VoltageLow		Voltage Low Limit

6.5.7.4 AnodeType enumeration

Aggregated Nodes Types for example:

SYS – System Zone/Region;

RUC – RUC Zone;

LFZ – Load Forecast Zone;

REG – Market Energy/Ancillary Service Region;

AGR – Aggregate Generation Resource;

POD – Point of Delivery;

ALR – Aggregate Load Resource;

LTAC – Load TransmissionAccessCharge (TAC) Group;

ACA – Adjacent Control Area

ASR – Aggregated System Resource

ECA – Embedded Control Area

Table 359 shows all literals of AnodeType.

Table 359 – Literals of MktDomain::AnodeType

literal	value	description
SYS		System Zone/Region;
RUC		RUC Zone
LFZ		Load Forecast Zone
REG		Market Energy/Ancillary Service Region;
AGR		Aggregate Generation Resource;
POD		Point of Delivery;
ALR		Aggregate Load Resource;
LTAC		Load TransmissionAccessCharge (TAC) Group;
ACA		Adjacent Control Area
ASR		Aggregated System Resource
ECA		Embedded Control Area
DER		Distributed Energy Resource.

6.5.7.5 ApnodeType enumeration

Aggregate Node Types for example:

AG – Aggregated Generation

CPZ – Custom Price Zone
 DPZ – Default Price Zone
 LAP – Load Aggregation Point
 TH – Trading Hub
 SYS – System Zone
 CA – Control Area
 GA – generic aggregation
 EHV – 500 kV
 GH – generic hub
 ZN – zone
 INT – Interface
 BUS – Bus

Table 360 shows all literals of ApnodeType.

Table 360 – Literals of MktDomain::ApnodeType

literal	value	description
AG		Aggregated Generation
CPZ		Custom Price Zone
DPZ		Default Price Zone
TH		Trading Hub
SYS		System Zone
CA		Control Area
DCA		Designated Congestion Area
GA		generic aggregation
GH		generic hub
EHV		500 kV – Extra High Voltage aggregate price nodes
ZN		Zone
INT		Interface
BUS		Bus

6.5.7.6 AreaControlMode enumeration

Area's present control mode.

Table 361 shows all literals of AreaControlMode.

Table 361 – Literals of MktDomain::AreaControlMode

literal	value	description
CF		CF = Constant Frequency
CTL		Constant Tie-Line
TLB		Tie-Line Bias
OFF		Off control

6.5.7.7 AutomaticDisplnstTypeCommitment enumeration

Commitment instruction types.

Table 362 shows all literals of AutomaticDisplnstTypeCommitment.

Table 362 – Literals of MktDomain::AutomaticDisplnstTypeCommitment

literal	value	description
START_UP		Start up instruction type
SHUT_DOWN		Shut down instruction type
DR_DEPLOY		Distributed Resource Deployment
DR_RELEASE		Distributed Resource Release
DR_ADJUSTMENT		Distributed Resource adjustment for a distributed resource that is already deployed (committed).

6.5.7.8 AutomaticDispatchMode enumeration

Automatic Dispatch mode.

Table 363 shows all literals of AutomaticDispatchMode.

Table 363 – Literals of MktDomain::AutomaticDispatchMode

literal	value	description
INTERVAL		
CONTINGENCY		Contingency occurrence, redispatch of contingency reserves
MANUAL		Operator override

6.5.7.9 BidCalculationBasis enumeration

The basis used to calculate the bid price curve for an energy default bid.

Table 364 shows all literals of BidCalculationBasis.

Table 364 – Literals of MktDomain::BidCalculationBasis

literal	value	description
LMP_BASED		Based on prices paid at particular pricing location.
COST_BASED		Based on unit generation characteristics and a cost of fuel.
NEGOTIATED		An amount negotiated with the designated Independent Entity.

6.5.7.10 BidMitigationStatus enumeration

For example:

'S' – Mitigated by SMPM because of "misconduct"

'L'; – Mitigated by LMPM because of "misconduct"

'R' – Modified by LMPM because of RMR rules

'M' – Mitigated because of "misconduct" both by SMPM and LMPM

'B' – Mitigated because of "misconduct" both by SMPM and modified by LMLM because of RMR rules

'O' – original

Table 365 shows all literals of BidMitigationStatus.

Table 365 – Literals of MktDomain::BidMitigationStatus

literal	value	description
S		
L		
R		
M		
B		
O		

6.5.7.11 BidMitigationType enumeration

For example:

Initial

Final

Table 366 shows all literals of BidMitigationType.

Table 366 – Literals of MktDomain::BidMitigationType

literal	value	description
I		
F		

6.5.7.12 BidType enumeration

For example:

DEFAULT_ENERGY_BID

DEFAULT_STARTUP_BID

DEFAULT_MINIMUM_LOAD_BID

Table 367 shows all literals of BidType.

Table 367 – Literals of MktDomain::BidType

literal	value	description
DEFAULT_ENERGY_BID		
DEFAULT_STARTUP_BID		
DEFAULT_MINIMUM_LOAD_BID		

6.5.7.13 BidTypeRMR enumeration

Bid self schedule type has two types as the required output of requirements and qualified pre-dispatch.

Table 368 shows all literals of BidTypeRMR.

Table 368 – Literals of MktDomain::BidTypeRMR

literal	value	description
REQUIREMENTS		Qualified pre-dispatch bid self schedule type.
QUALIFIED_PREDISPATCH		Output of requirements bid self schedule type.

6.5.7.14 CRRCategoryType enumeration

Congestion Revenue Rights category types.

Table 369 shows all literals of CRRCategoryType.

Table 369 – Literals of MktDomain::CRRCategoryType

literal	value	description
NSR		Network Service
PTP		Point to Point

6.5.7.15 CRRHedgeType enumeration

Congestion Revenue Right hedge type.

Table 370 shows all literals of CRRHedgeType.

Table 370 – Literals of MktDomain::CRRHedgeType

literal	value	description
OBLIGATION		
OPTION		

6.5.7.16 CRRRoleType enumeration

Role types an organisation can play with respect to a congestion revenue right.

Table 371 shows all literals of CRRRoleType.

Table 371 – Literals of MktDomain::CRRRoleType

literal	value	description
SELLER		
BUYER		
OWNER		

6.5.7.17 CRRSegmentType enumeration

Type of the CRR, from the possible type definitions in the CRR System (e.g. 'LSE', 'ETC').

Table 372 shows all literals of CRRSegmentType.

Table 372 – Literals of MktDomain::CRRSegmentType

literal	value	description
AUC		
CAP		
CF		
CVR		Converted rights.
ETC		Existing Transmission Contract
LSE		Load Serving Entity.
MT		Merchant transmission.
TOR		Transmission Ownership Rights.

6.5.7.18 CheckOutType enumeration

To indicate a check out type such as adjusted capacity or dispatch capacity.

Table 373 shows all literals of CheckOutType.

Table 373 – Literals of MktDomain::CheckOutType

literal	value	description
PRE_HOUR		
PRE_SCHEDULE		
AFTER_THE_FACT		

6.5.7.19 CommitmentType enumeration

For example:

SELF – Self commitment

ISO – New commitment for this market period

UC – Existing commitment that was a hold over from a previous market

Table 374 shows all literals of CommitmentType.

Table 374 – Literals of MktDomain::CommitmentType

literal	value	description
SELF		
ISO		
UC		

6.5.7.20 ConstraintLimitType enumeration

Binding constraint results limit type, For example:

MAXIMUM

MINIMUM

Table 375 shows all literals of ConstraintLimitType.

Table 375 – Literals of MktDomain::ConstraintLimitType

literal	value	description
MAXIMUM		
MINIMUM		

6.5.7.21 ConstraintRampType enumeration

Constraint Ramp type.

Table 376 shows all literals of ConstraintRampType.

Table 376 – Literals of MktDomain::ConstraintRampType

literal	value	description
FAST		
SLOW		

6.5.7.22 ContractType enumeration

Transmission Contract Type, For example:

O – Other

TE – Transmission Export

TI – Transmission Import

ETC – Existing Transmission Contract

RMT – RMT Contract

TOR – Transmission Ownership Right

RMR – Reliability Must Run Contract

CVR – Converted contract

Table 377 shows all literals of ContractType.

Table 377 – Literals of MktDomain::ContractType

literal	value	description
ETC		ETC – Existing Transmission Contract
TOR		TOR – Transmission Ownership Right
RMR		RMR – Reliability Must Run Contract
RMT		RMT – RMT Contract
O		O – Other
TE		TE – Transmission Export
TI		TI – Transmission Import
CVR		CVR – Converted contract.

6.5.7.23 CostBasis enumeration

For example:

Bid Cost

Proxy Cost

Registered Cost

Table 378 shows all literals of CostBasis.

Table 378 – Literals of MktDomain::CostBasis

literal	value	description
BIDC		
PRXC		
REGC		

6.5.7.24 DispatchResponseType enumeration

For example:

NON_RESPONSE

ACCEPT

DECLINE

PARTIAL

Table 379 shows all literals of DispatchResponseType.

Table 379 – Literals of MktDomain::DispatchResponseType

literal	value	description
NON_RESPONSE		
ACCEPT		
DECLINE		
PARTIAL		

6.5.7.25 EnergyPriceIndexType enumeration

For example:

WHOLESALE

RETAIL

BOTH

Table 380 shows all literals of EnergyPriceIndexType.

Table 380 – Literals of MktDomain::EnergyPriceIndexType

literal	value	description
WHOLESALE		
RETAIL		
BOTH		

6.5.7.26 EnergyProductType enumeration

Energy product type.

Table 381 shows all literals of EnergyProductType.

Table 381 – Literals of MktDomain::EnergyProductType

literal	value	description
FIRM		Firm
NFRM		Non Firm
DYN		Dynamic
WHL		Wheeling

6.5.7.27 EquipmentStatusType enumeration

Status of equipment.

Table 382 shows all literals of EquipmentStatusType.

Table 382 – Literals of MktDomain::EquipmentStatusType

literal	value	description
In		Equipment is in.
Out		Equipment is out.

6.5.7.28 EnergyTransactionType enumeration

Defines the state of a transaction.

Table 383 shows all literals of EnergyTransactionType.

Table 383 – Literals of MktDomain::EnergyTransactionType

literal	value	description
approve		Approve
deny		Deny
study		Study

6.5.7.29 ExecutionType enumeration

Execution types of Market Runs.

Table 384 shows all literals of ExecutionType.

Table 384 – Literals of MktDomain::ExecutionType

literal	value	description
DA		Day Ahead
HASP		Real Time Hour Ahead Execution
RTPD		Real Time Pre-dispatch
RTD		Real Time Dispatch

6.5.7.30 FlagTypeRMR enumeration

Indicates whether the unit is RMR and it's condition type, for example:

N' – not an RMR unit

'1' – RMR Condition 1 unit

'2' – RMR Condition 2 unit

Table 385 shows all literals of FlagTypeRMR.

Table 385 – Literals of MktDomain::FlagTypeRMR

literal	value	description
N		'N' – not an RMR unit
1		'1' – RMR Condition 1 unit
2		'2' – RMR Condition 2 unit

6.5.7.31 FlowDirectionType enumeration

Specifies the direction of energy flow in the flowgate.

Table 386 shows all literals of FlowDirectionType.

Table 386 – Literals of MktDomain::FlowDirectionType

literal	value	description
Forward		Forward direction.
Reverse		Reverse direction.

6.5.7.32 FuelSource enumeration

For example:

Bio Gas (Landfill, Sewage, Digester, etc.)

Biomass

Coal

DIST

Natural Gas

Geothermal

HRCV

None

Nuclear

Oil

Other

Solar

Waste to Energy

Water

Wind

Table 387 shows all literals of FuelSource.

Table 387 – Literals of MktDomain::FuelSource

literal	value	description
NG		Natural Gas
NNG		Non-Natural Gas
BGAS		Bio Gas (Landfill, Sewage, Digester, etc.)
BIOM		Biomass
COAL		Coal
DIST		
GAS		
GEOT		GeoThermal
HRCV		
NONE		
NUCL		Nuclear
OIL		
OTHR		Other
SOLR		Solar
WAST		Waste to Energy
WATR		Water
WIND		Wind

6.5.7.33 InterTieDirection enumeration

Direction of an intertie.

Table 388 shows all literals of InterTieDirection.

Table 388 – Literals of MktDomain::InterTieDirection

literal	value	description
E		Export.
I		Import.

6.5.7.34 LoadForecastType enumeration

Load forecast zone types.

Table 389 shows all literals of LoadForecastType.

Table 389 – Literals of MktDomain::LoadForecastType

literal	value	description
LFZ		Load forecast zone.
LZMS		Metered sub system zone.

6.5.7.35 MPMTIdentifierType enumeration

Market power mitigation test identifier type, for example:

- 1 – Global Price Test
- 2 – Global Conduct Test
- 3 – Global Impact Test
- 4 – Local Price Test
- 5 – Local Conduct Test
- 6 – Local Impact Test

Table 390 shows all literals of MPMTIdentifierType.

Table 390 – Literals of MktDomain::MPMTIdentifierType

literal	value	description
1		1 – Global Price Test.
2		2 – Global Conduct Test.
3		3 – Global Impact Test.
4		4 – Local Price Test.
5		5 – Local Conduct Test.
6		6 – Local Impact Test.

6.5.7.36 MPMTMethodType enumeration

Market power mitigation test method type.

Tests with the normal (default) thresholds or tests with the alternate thresholds.

Table 391 shows all literals of MPMTMethodType.

Table 391 – Literals of MktDomain::MPMTMethodType

literal	value	description
NORMAL		Normal.
ALTERNATE		Alternate.

6.5.7.37 MPMTOutcome enumeration

For example:

- Passed
- Failed
- Disabled

Skipped

Table 392 shows all literals of MPMTestOutcome.

Table 392 – Literals of MktDomain::MPMTestOutcome

literal	value	description
P		Passed
F		Failed
D		Disabled
S		Skipped

6.5.7.38 MQSCHGType enumeration

For example:

ADD – add

CHG – change

Table 393 shows all literals of MQSCHGType.

Table 393 – Literals of MktDomain::MQSCHGType

literal	value	description
ADD		
CHG		

6.5.7.39 MQSInstructionSource enumeration

Valid values, for example:

INS – Instruction from RTM

ACT – Actual instruction after the fact

Table 394 shows all literals of MQSInstructionSource.

Table 394 – Literals of MktDomain::MQSInstructionSource

literal	value	description
INS		
ACT		

6.5.7.40 MarketEventStatusKind enumeration

Market event status types.

Table 395 shows all literals of MarketEventStatusKind.

Table 395 – Literals of MktDomain::MarketEventStatusKind

literal	value	description
active		The status of the event is currently in a active state. Active (when sysdate is equal or greater than to planned start time)
cancelled		The status of the event is currently in a cancelled state. Cancelled (stopped before planned start time or planned end time)
completed		The status of the event is currently in a completed state. Complete (when sysdate is equal to the release time)
planned		The status of the event is currently in a planned state. Planned (sysdate is less than planned start time)

6.5.7.41 MarketProductSelfSchedType enumeration

Market product self schedule bid types.

Table 396 shows all literals of MarketProductSelfSchedType.

Table 396 – Literals of MktDomain::MarketProductSelfSchedType

literal	value	description
ETC		Existing Transmission Contract.
TOR		Transmission Ownership Right.
RMR		Reliability Must Run.
RGMR		Regulatory must run.
RMT		Reliability must take.
PT		Price taker.
LPT		Low price taker.
SP		Self provision.
RA		Resource adequacy.

6.5.7.42 MarketProductType enumeration

For example:

Energy, Reg Up, Reg Down, Spin Reserve, Nonspin Reserve, RUC, Load Following Up, and Load Following Down.

Table 397 shows all literals of MarketProductType.

Table 397 – Literals of MktDomain::MarketProductType

literal	value	description
EN		energy type
RU		regulation up
RD		regulation down
SR		spinning reserve
NR		non spinning reserve
RC		Residual Unit Commitment
LFU		Load following up
LFD		Load following down
REG		Regulation

6.5.7.43 MarketType enumeration

Market type.

Table 398 shows all literals of MarketType.

Table 398 – Literals of MktDomain::MarketType

literal	value	description
DAM		Day ahead market.
RTM		Real time market.
HAM		Hour Ahead Market.
RUC		Residual Unit Commitment.

6.5.7.44 MktAccountKind enumeration

Kind of Market account.

Table 399 shows all literals of MktAccountKind.

Table 399 – Literals of MktDomain::MktAccountKind

literal	value	description
normal		
reversal		
statistical		
estimate		

6.5.7.45 MktBillMediaKind enumeration

Kind of bill media.

Table 400 shows all literals of MktBillMediaKind.

Table 400 – Literals of MktDomain::MktBillMediaKind

literal	value	description
paper		
electronic		
other		

6.5.7.46 MktInvoiceLineItemKind enumeration

Kind of invoice line item.

Table 401 shows all literals of MktInvoiceLineItemKind.

Table 401 – Literals of MktDomain::MktInvoiceLineItemKind

literal	value	description
initial		
recalculation		
other		

6.5.7.47 OnOff enumeration

ON

OFF

Table 402 shows all literals of OnOff.

Table 402 – Literals of MktDomain::OnOff

literal	value	description
ON		
OFF		

6.5.7.48 ParticipationCategoryMPM enumeration

For example:

'Y' – Participates in both LMPM and SMPM

'N' – Not included in LMP price measures

'S' – Participates in SMPM price measures

'L' – Participates in LMPM price measures

Table 403 shows all literals of ParticipationCategoryMPM.

Table 403 – Literals of MktDomain::ParticipationCategoryMPM

literal	value	description
Y		
N		
S		
L		

6.5.7.49 PassIndicatorType enumeration

Defines the individual passes that produce results per execution type/market type.

Table 404 shows all literals of PassIndicatorType.

Table 404 – Literals of MktDomain::PassIndicatorType

literal	value	description
MPM-1		Market Power Mitigation Pass 1
MPM-2		Market Power Mitigation Pass 2
MPM-3		Market Power Mitigation Pass 3
MPM-4		Market Power Mitigation Pass 4
RUC		Residual Unit Commitment
RTPD		Real Time Pre Dispatch
RTED		Real Time Economic Dispatch
HA-SCUC		Hour Ahead Security Constrained Unit Commitment
DA		Day Ahead

6.5.7.50 PriceTypeKind enumeration

Value of this enumeration for different prices include "total" for the complete/full/all-in price, "congestion" for the congestion cost associated with the total price, the "loss" for the loss price associated with the total price, "capacity" for prices related to installed or reserved capacity, "mileage" for use-based accounting, "system" for system-wide/copper-plate prices, and "delivery" for distribution-based prices.

Table 405 shows all literals of PriceTypeKind.

Table 405 – Literals of MktDomain::PriceTypeKind

literal	value	description
capacity		
congestion		
delivery		
loss		
mileage		
system		
total		

6.5.7.51 PurposeFlagType enumeration

MPM Purpose Flag, for example:

Nature of threshold data:

'M' – Mitigation threshold

'R' – Reporting threshold

Table 406 shows all literals of PurposeFlagType.

Table 406 – Literals of MktDomain::PurposeFlagType

literal	value	description
M		
R		

6.5.7.52 RampCurveType enumeration

For example:

0 – Fixed ramp rate independent of rate function unit MW output

1 – Static ramp rates as a function of unit MW output only

2 – Dynamic ramp rates as a function of unit MW output and ramping time

Table 407 shows all literals of RampCurveType.

Table 407 – Literals of MktDomain::RampCurveType

literal	value	description
0		Fixed ramp rate independent of rate function unit MW output
1		Static ramp rates as a function of unit MW output only
2		Dynamic ramp rates as a function of unit MW output and ramping time

6.5.7.53 RampRateCondition enumeration

Ramp rate condition.

Table 408 shows all literals of RampRateCondition.

Table 408 – Literals of MktDomain::RampRateCondition

literal	value	description
WORST		
BEST		
NORMAL		
NA		not applicable

6.5.7.54 RampRateType enumeration

Ramp rate curve type.

Table 409 shows all literals of RampRateType.

Table 409 – Literals of MktDomain::RampRateType

literal	value	description
OP		Operational ramp rate.
REG		Regulating ramp rate.
OP_RES		Operating reserve ramp rate.
LD_DROP		Load drop ramp rate.
LD_PICKUP		Load pick up rate.
INTERTIE		Intertie ramp rate.

6.5.7.55 ReserveRequirementType enumeration

For example:

Operating Reserve, Regulation, Contingency

Table 410 shows all literals of ReserveRequirementType.

Table 410 – Literals of MktDomain::ReserveRequirementType

literal	value	description
OPRSV		Operating Reserve
CONT		Contingency
REG		Regulation

6.5.7.56 ResourceAssnType enumeration

For example:

Asset Owner Sink designator for use by CRR

Asset Owner Source designator for use by CRR

Reliability Must Run

Scheduling Coordinator

Load Serving Entity

Table 411 shows all literals of ResourceAssnType.

Table 411 – Literals of MktDomain::ResourceAssnType

literal	value	description
CSNK		
CSRC		
RMR		
SC		
LSE		

6.5.7.57 ResourceCapacityType enumeration

Resource capacity type.

Table 412 shows all literals of ResourceCapacityType.

Table 412 – Literals of MktDomain::ResourceCapacityType

literal	value	description
RU		Regulation Up.
RD		Regulation Down.
SR		Spinning reserve.
NR		Non spinning reserve.
MO		Must Offer.
FO		Flexible Offer.
RA		Resource Adequacy.
RMR		Reliability Must Run.

6.5.7.58 ResourceCertificationKind enumeration

Types used for resource certification.

Table 413 shows all literals of ResourceCertificationKind.

Table 413 – Literals of MktDomain::ResourceCertificationKind

literal	value	description
RegulationUp		Regulation Up (RU, REGUP)
RegulationDown		Regulation Down (RD, REGDN)
SpinningReserve		Spinning Reserve (SR, RRSPIN)
NonSpinningReserve		Non Spinning Reserve (NR, NONSPIN)
ReliabilityMustRun		Reliability Must Run (RMR)
BLACKSTART		Black start
DemandSideResponse		Demand Side Reponse (DSR)
SynchronousCondenser		Synchronous Condenser (SYNCCOND)
IntermittentResource		Intermittent resource
ReliabilityUnitCommitment		Reliability unit commitment (RUC)
Energy		
Capacity		

6.5.7.59 ResourceLimitIndicator enumeration

Locational AS Flags indicating whether the Upper or Lower Bound limit of the AS regional procurement is binding.

Table 414 shows all literals of ResourceLimitIndicator.

Table 414 – Literals of MktDomain::ResourceLimitIndicator

literal	value	description
UPPER		
LOWER		

6.5.7.60 ResourceRegistrationStatus enumeration

Types of resource registration status, for example:

Active

Mothballed

Planned

Decommissioned

Table 415 shows all literals of ResourceRegistrationStatus.

Table 415 – Literals of MktDomain::ResourceRegistrationStatus

literal	value	description
Active		Resource registration is active
Planned		Registration status is in the planning stage
Mothballed		Resource registration has been suspended
Decommissioned		Resource registration status is decommissioned

6.5.7.61 ResultsConstraintType enumeration

Market results binding constraint types.

Table 416 shows all literals of ResultsConstraintType.

Table 416 – Literals of MktDomain::ResultsConstraintType

literal	value	description
FG_act		Flowgate actual base case
Contingency		Contingency.
Interface		Interface.
Actual		Actual.

6.5.7.62 SelfSchedReferenceType enumeration

Indication of which type of self schedule is being referenced.

Table 417 shows all literals of SelfSchedReferenceType.

Table 417 – Literals of MktDomain::SelfSchedReferenceType

literal	value	description
ETC		Existing transmission contract.
TOR		Transmission ownership right.

6.5.7.63 SelfScheduleBreakdownType enumeration

Self schedule breakdown type.

Table 418 shows all literals of SelfScheduleBreakdownType.

Table 418 – Literals of MktDomain::SelfScheduleBreakdownType

literal	value	description
ETC		Existing transmission contract.
TOR		Transmission ownership right.
LPT		Low price taker.

6.5.7.64 SwitchStatusType enumeration

Circuit Breaker Status (closed or open) of the circuit breaker.

Table 419 shows all literals of SwitchStatusType.

Table 419 – Literals of MktDomain::SwitchStatusType

literal	value	description
Closed		Closed status.
Open		Open status.

6.5.7.65 TRType enumeration

Transmission Contract Right type -for example:

individual or chain of contract rights

Table 420 shows all literals of TRType.

Table 420 – Literals of MktDomain::TRType

literal	value	description
CHAIN		TR chain
INDIVIDUAL		Individual TR

6.5.7.66 TimeOfUse enumeration

Time of Use used by a CRR definition for specifying the time the CRR spans. ON – CRR spans the on peak hours of the day, OFF – CRR spans the off peak hours of the day, 24HR – CRR spans the entire day.

Table 421 shows all literals of TimeOfUse.

Table 421 – Literals of MktDomain::TimeOfUse

literal	value	description
ON		Time of use spans only the on peak hours of the day.
OFF		Time of use spans only the off peak hours of the day.
24HR		Time of use spans the entire day, 24 hours.

6.5.7.67 TradeType enumeration

Trade type.

Table 422 shows all literals of TradeType.

Table 422 – Literals of MktDomain::TradeType

literal	value	description
IST		InterSC Trade.
AST		Ancillary Services Trade.
UCT		Unit Commitment Trade.

6.5.7.68 UnitRegulationKind enumeration

Unit regulation kind.

Table 423 shows all literals of UnitRegulationKind.

Table 423 – Literals of MktDomain::UnitRegulationKind

literal	value	description
0		Unit is not on regulation.
1		Unit is on AGC and regulating.
2		Unit is suppose to be on regulation but it is not under regulation now.

6.5.7.69 UnitType enumeration

Combined Cycle

Gas Turbine

Hydro Turbine

Other

Photovoltaic

Hydro Pump-Turbine

Reciprocating Engine

Steam Turbine

Synchronous Condenser

Wind Turbine

Table 424 shows all literals of UnitType.

Table 424 – Literals of MktDomain::UnitType

literal	value	description
CCYC		Combined Cycle
GTUR		Gas Turbine
HYDR		Hydro Turbine
OTHR		Other
PHOT		Photovoltaic
PTUR		Hydro Pump-Turbine
RECP		Reciprocating Engine
STUR		Steam Turbine
SYNC		Synchronous Condenser
WIND		Wind Turbine

6.5.7.70 YesNo enumeration

Used as a flag set to Yes or No.

Table 425 shows all literals of YesNo.

Table 425 – Literals of MktDomain::YesNo

literal	value	description
YES		
NO		

6.5.8 Package ParticipantInterfaces**6.5.8.1 General**

Market participant interfaces for bids and trades.

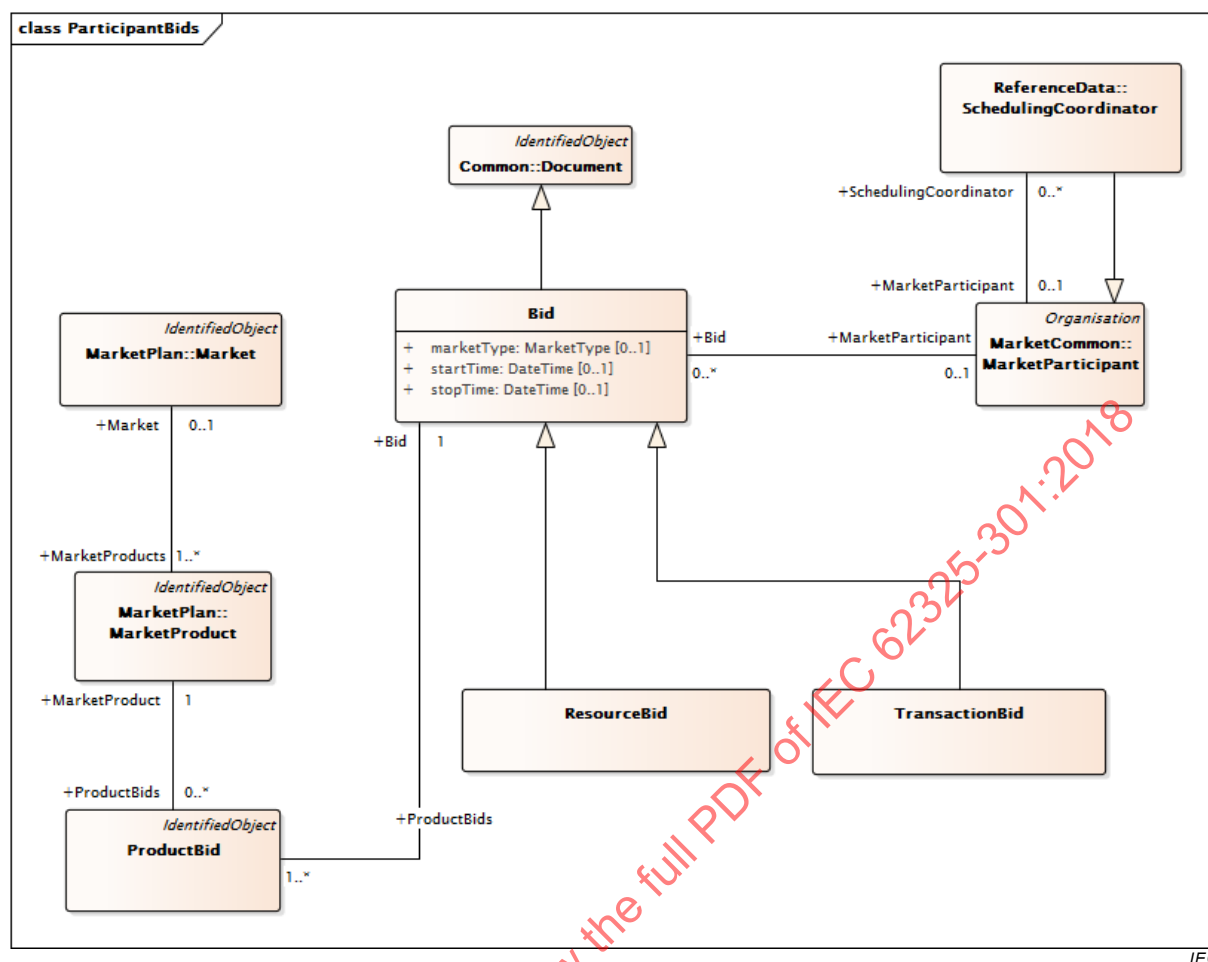
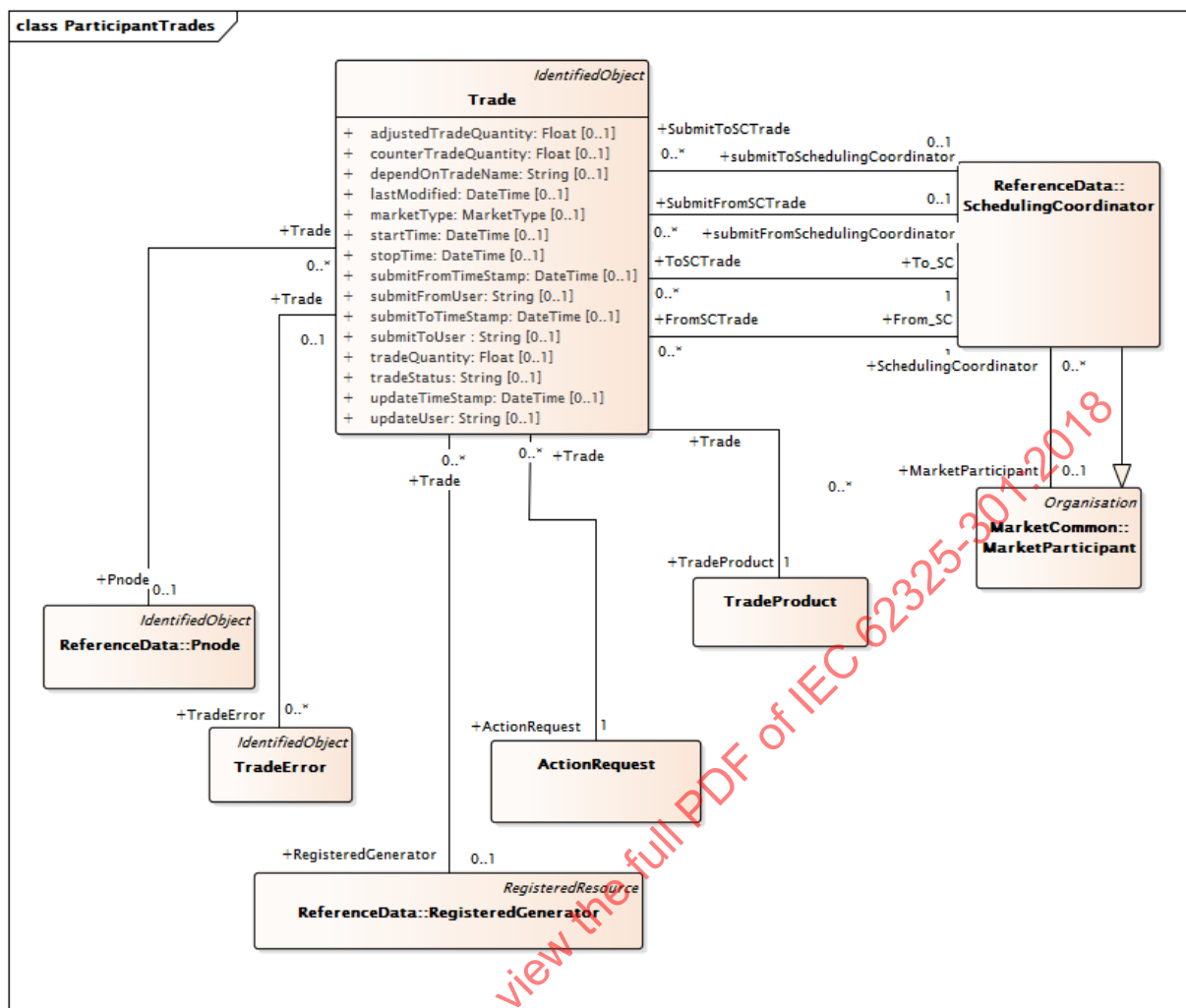


Figure 54 – Class diagram ParticipantInterfaces::ParticipantBids

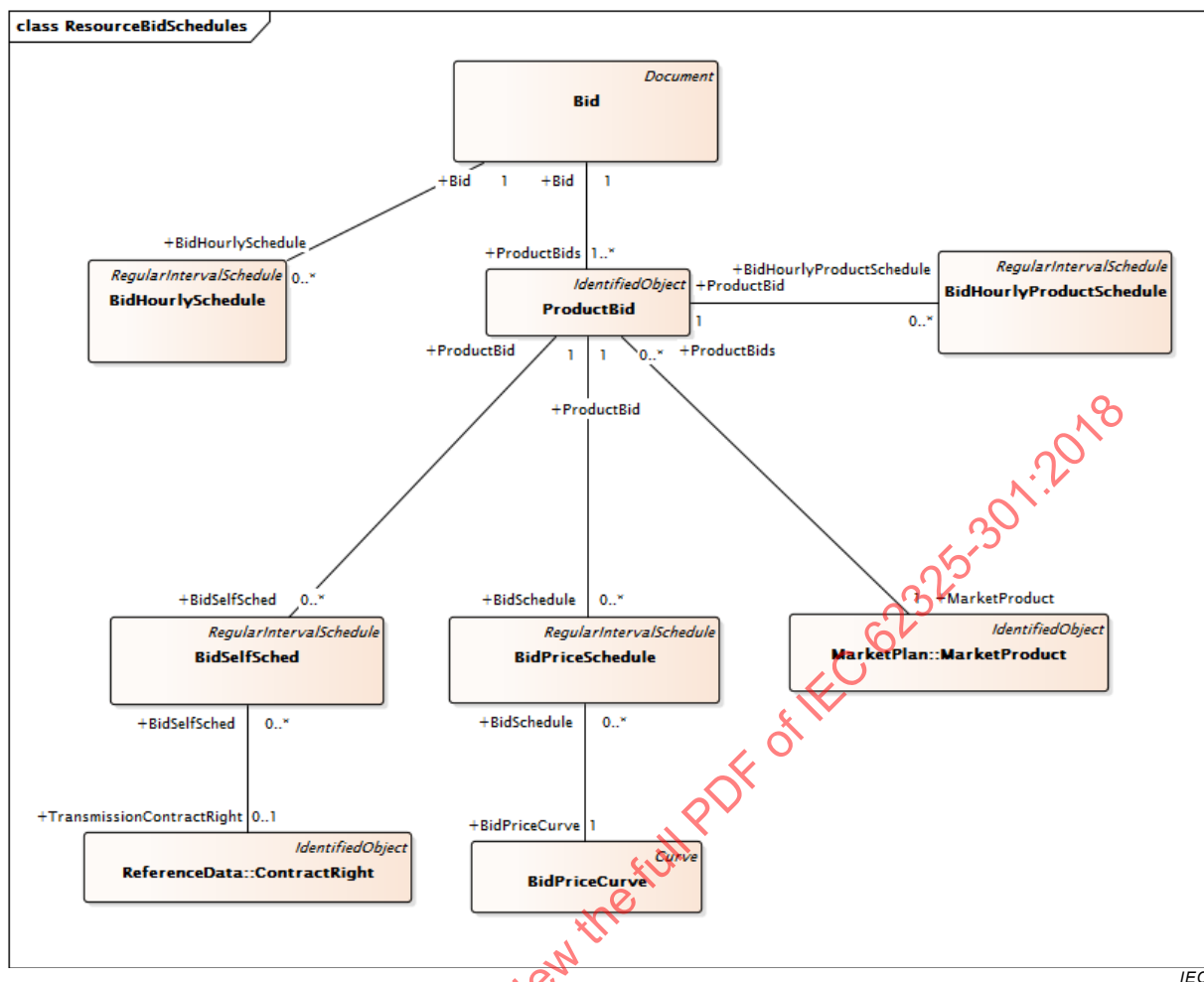
Figure 54: Shows the overview of the class and associations that are used to model offers and bids. The term bid is used to include offers to sell and bids to buy one or more electrical products. The bid is a subclass of the document class from the IEC 61968 package. Bids are further classified as Resource Bids or Transaction Bids. Bids are associated with Scheduling Coordinators that submit them on behalf of market participants as shown by the association between the Bid class and the Scheduling Coordinator class.



IEC

Figure 55 – Class diagram ParticipantInterfaces::ParticipantTrades

Figure 55: Shows the class and associations used to model inter scheduling coordinator financial trades. The TradeProduct class is used to indicate the electric product that is included in the trade. The SchedulingCoordinator class is used to indicate the scheduling coordinators involved in the trade.



IEC

Figure 56 – Class diagram ParticipantInterfaces::ResourceBidSchedules

Figure 56: Shows the classes and associations used to model bid schedules. A scheduling coordinator may choose to submit a bid that is valid for several intervals of the market's time horizon. The classes of this model support this concept.

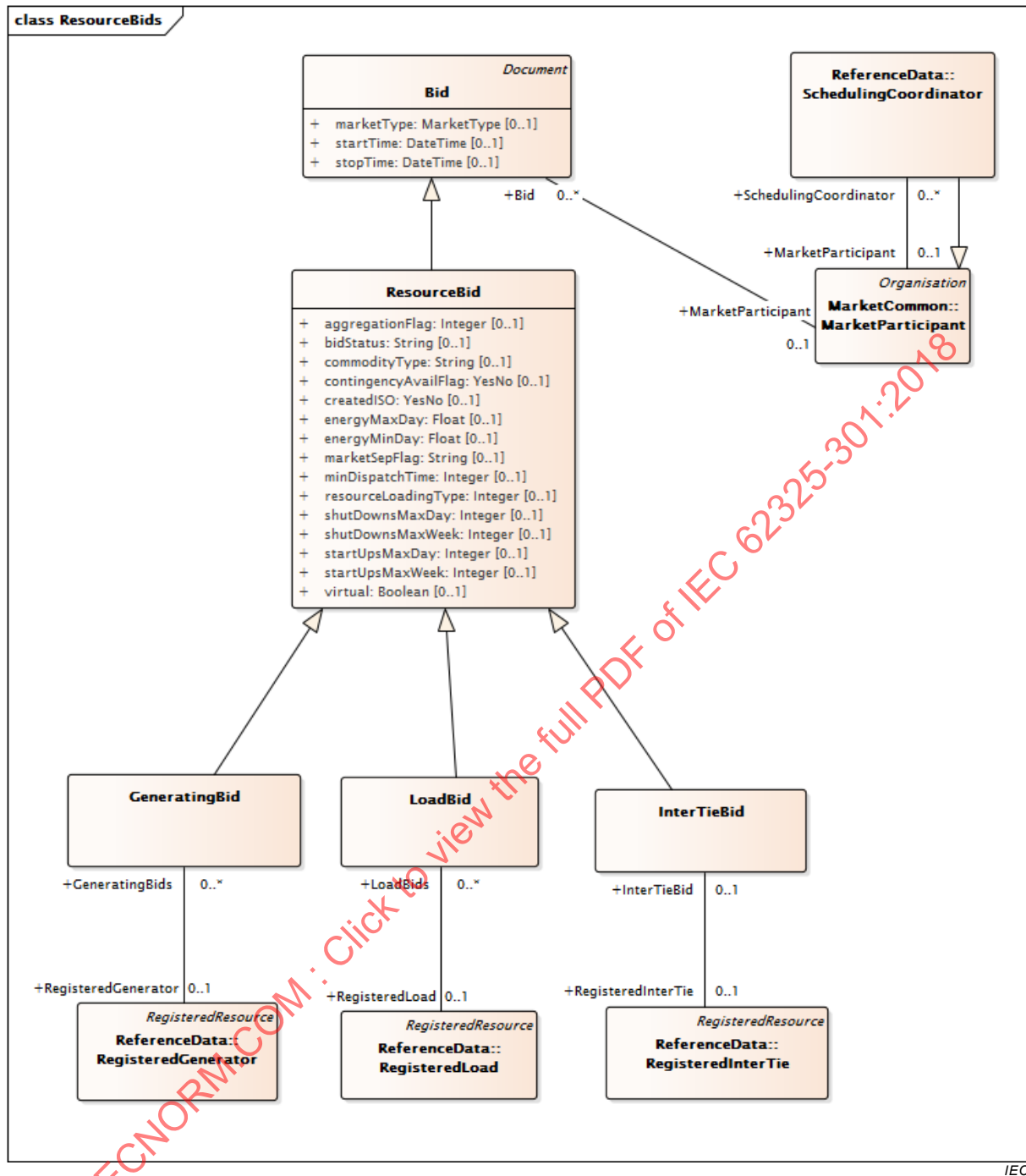


Figure 57 – Class diagram ParticipantInterfaces::ResourceBids

Figure 57: Shows the classes and associations used to model resource bids. The resource bid model includes the subclasses GeneratingBid, LoadBid, and IntertieBid to model the relationships to the ResourceBid and Bid classes.

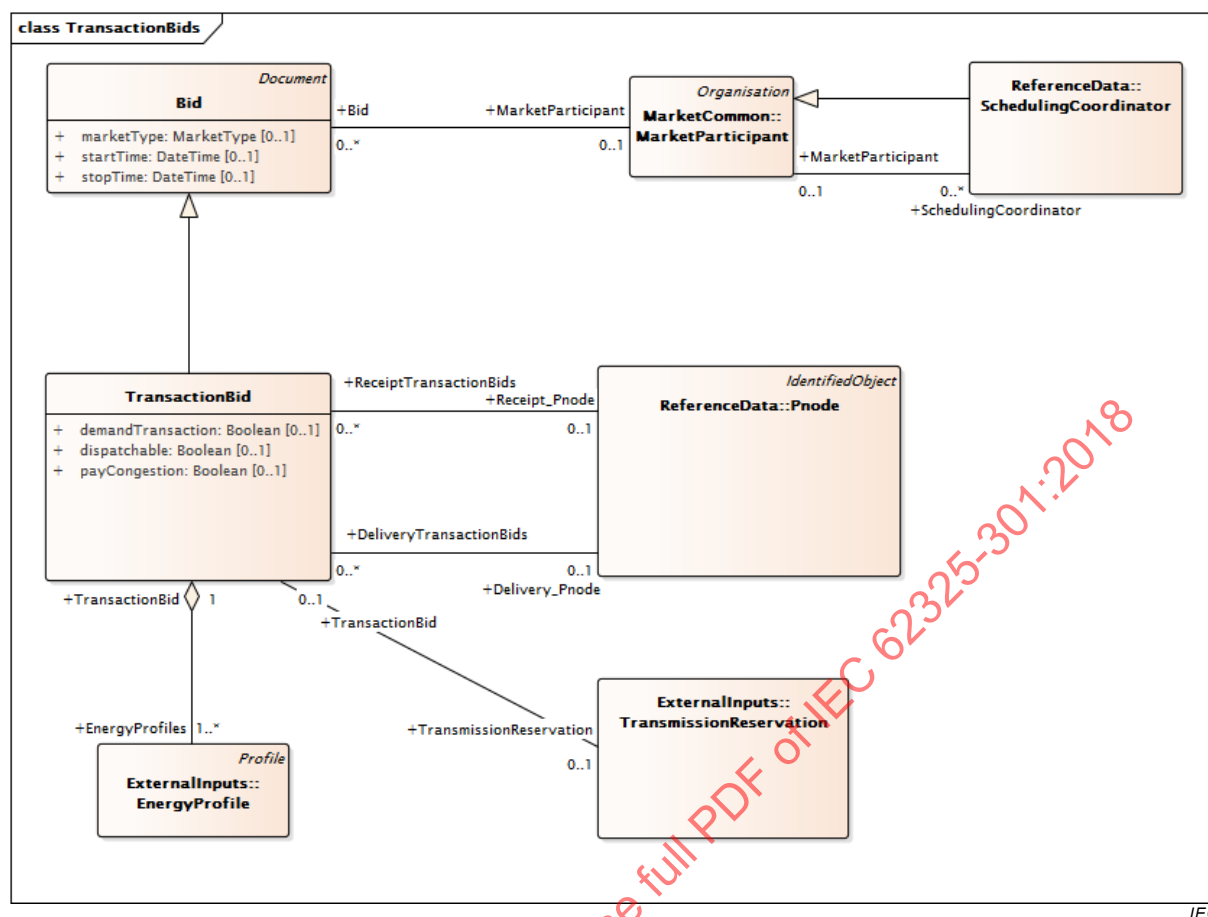


Figure 58 – Class diagram ParticipantInterfaces::TransactionBids

Figure 58: Shows the classes and associations used to model transaction bids. The TransactionBid model includes the subclasses GeneratingBid, LoadBid, and IntertieBid to model the relationships to the ResourceBid and Bid classes.

6.5.8.2 ActionRequest root class

Action request against an existing Trade.

Table 426 shows all attributes of ActionRequest.

Table 426 – Attributes of ParticipantInterfaces::ActionRequest

name	mult	type	description
actionName	0..1	ActionType	Action name type for the action request.

Table 427 shows all association ends of ActionRequest with other classes.

Table 427 – Association ends of ParticipantInterfaces::ActionRequest with other classes

mult from	name	mult to	type	description
1..1	Bid	0..*	Bid	
1..1	Trade	0..*	Trade	

6.5.8.3 AreaLoadBid

AreaLoadBid is not submitted by a market participant into the Markets. Instead, it is simply an aggregation of all LoadBids contained within a specific SubControlArea. This entity should inherit from Bid for representation of the timeframe (startTime, stopTime) and the market type.

Table 428 shows all attributes of AreaLoadBid.

Table 428 – Attributes of ParticipantInterfaces::AreaLoadBid

name	mult	type	description
demandBidMW	0..1	Float	The Demand Bid Megawatt for the area case. Attribute Usage: This is Scheduled demand MW in Day Ahead
startTime	0..1	DateTime	inherited from: Bid
stopTime	0..1	DateTime	inherited from: Bid
marketType	0..1	MarketType	inherited from: Bid
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 429 shows all association ends of AreaLoadBid with other classes.

Table 429 – Association ends of ParticipantInterfaces::AreaLoadBid with other classes

mult from	name	mult to	type	description
0..1	LoadBid	0..*	LoadBid	
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: Bid
0..*	EnergyMarket	1..1	EnergyMarket	inherited from: Bid
0..1	ChargeProfiles	0..*	ChargeProfile	inherited from: Bid
1..1	MitigatedBidSegment	0..*	MitigatedBidSegment	inherited from: Bid
0..1	MitigatedBid	0..*	MitigatedBid	inherited from: Bid
0..1	RMRDetermination	0..*	RMRDetermination	inherited from: Bid
0..*	ActionRequest	1..1	ActionRequest	inherited from: Bid
1..1	BidHourlySchedule	0..*	BidHourlySchedule	inherited from: Bid
1..1	ProductBids	1..*	ProductBid	inherited from: Bid

mult from	name	mult to	type	description
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.4 AttributeProperty root class

Property for a particular attribute that contains name and value.

Table 430 shows all attributes of AttributeProperty.

Table 430 – Attributes of ParticipantInterfaces::AttributeProperty

name	mult	type	description
sequence	0..1	String	
propertyName	0..1	String	
propertyValue	0..1	String	

Table 431 shows all association ends of AttributeProperty with other classes.

Table 431 – Association ends of ParticipantInterfaces::AttributeProperty with other classes

mult from	name	mult to	type	description
0..*	MktUserAttribute	1..1	MktUserAttribute	

6.5.8.5 Bid

Represents both bids to purchase and offers to sell energy or ancillary services in an RTO-sponsored market.

Table 432 shows all attributes of Bid.

Table 432 – Attributes of ParticipantInterfaces::Bid

name	mult	type	description
startTime	0..1	DateTime	Start time and date for which bid applies.
stopTime	0..1	DateTime	Stop time and date for which bid is applicable.
marketType	0..1	MarketType	The market type, DAM or RTM.
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document

name	mult	type	description
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 433 shows all association ends of Bid with other classes.

Table 433 – Association ends of ParticipantInterfaces::Bid with other classes

mult from	name	mult to	type	description
0..*	MarketParticipant	0..1	MarketParticipant	
0..*	EnergyMarket	1..1	EnergyMarket	
0..1	ChargeProfiles	0..*	ChargeProfile	
1..1	MitigatedBidSegment	0..*	MitigatedBidSegment	
0..1	MitigatedBid	0..*	MitigatedBid	
0..1	RMRDetermination	0..*	RMRDetermination	
0..*	ActionRequest	1..1	ActionRequest	
1..1	BidHourlySchedule	0..*	BidHourlySchedule	
1..1	ProductBids	1..*	ProductBid	A bid comprises one or more product bids of market products
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.6 BidDistributionFactor root class

This class allows SC to input different time intervals for distribution factors.

Table 434 shows all attributes of BidDistributionFactor.

Table 434 – Attributes of ParticipantInterfaces::BidDistributionFactor

name	mult	type	description
timeIntervalStart	0..1	DateTime	Start of the time interval in which bid is valid (yyyy-mm-dd hh24: mi: ss).
timeIntervalEnd	0..1	DateTime	End of the time interval n which bid is valid (yyyy-mm-dd hh24: mi: ss)

Table 435 shows all association ends of BidDistributionFactor with other classes.

Table 435 – Association ends of ParticipantInterfaces::BidDistributionFactor with other classes

mult from	name	mult to	type	description
0..1	PnodeDistributionFactor	0..*	PnodeDistributionFactor	
0..*	ProductBid	1..1	ProductBid	

6.5.8.7 BidError

This class represent the error information for a bid that is detected during bid validation.

Table 436 shows all attributes of BidError.

Table 436 – Attributes of ParticipantInterfaces::BidError

name	mult	type	description
errPriority	0..1	Integer	Priority number for the error message
errMessage	0..1	String	error message
ruleID	0..1	Integer	
startTime	0..1	DateTime	hour wihthin the bid for which the error applies
endTime	0..1	DateTime	hour wihthin the bid for which the error applies
logTimeStamp	0..1	DateTime	
componentType	0..1	String	
msgLevel	0..1	Integer	
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 437 shows all association ends of BidError with other classes.

Table 437 – Association ends of ParticipantInterfaces::BidError with other classes

mult from	name	mult to	type	description
0..*	MarketProduct	0..1	MarketProduct	
0..*	ResourceBid	0..*	ResourceBid	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.8 BidHourlyProductSchedule

Containment for bid parameters that are dependent on a market product type.

Table 438 shows all attributes of BidHourlyProductSchedule.

Table 438 – Attributes of ParticipantInterfaces::BidHourlyProductSchedule

name	mult	type	description
endTime	0..1	DateTime	inherited from: RegularIntervalSchedule
timeStep	0..1	Seconds	inherited from: RegularIntervalSchedule
startTime	0..1	DateTime	inherited from: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value1Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value2Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 439 shows all association ends of BidHourlyProductSchedule with other classes.

Table 439 – Association ends of ParticipantInterfaces::BidHourlyProductSchedule with other classes

mult from	name	mult to	type	description
0..*	ProductBid	1..1	ProductBid	
1..1	TimePoints	1..*	RegularTimePoint	inherited from: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.9 BidHourlySchedule

Containment for bid hourly parameters that are not product dependent.

Table 440 shows all attributes of BidHourlySchedule.

Table 440 – Attributes of ParticipantInterfaces::BidHourlySchedule

name	mult	type	description
endTime	0..1	DateTime	inherited from: RegularIntervalSchedule
timeStep	0..1	Seconds	inherited from: RegularIntervalSchedule
startTime	0..1	DateTime	inherited from: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value1Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value2Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 441 shows all association ends of BidHourlySchedule with other classes.

Table 441 – Association ends of ParticipantInterfaces::BidHourlySchedule with other classes

mult from	name	mult to	type	description
0..*	Bid	1..1	Bid	
1..1	TimePoints	1..*	RegularTimePoint	inherited from: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.10 BidPriceCurve

Relationship between unit operating price in \$/hour (Y-axis) and unit output in MW (X-axis).

Table 442 shows all attributes of BidPriceCurve.

Table 442 – Attributes of ParticipantInterfaces::BidPriceCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 443 shows all association ends of BidPriceCurve with other classes.

Table 443 – Association ends of ParticipantInterfaces::BidPriceCurve with other classes

mult from	name	mult to	type	description
1..1	BidSchedule	0..*	BidPriceSchedule	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.11 BidPriceSchedule

Defines bid schedules to allow a product bid to use specified bid price curves for different time intervals.

Table 444 shows all attributes of BidPriceSchedule.

Table 444 – Attributes of ParticipantInterfaces::BidPriceSchedule

name	mult	type	description
bidType	0..1	BidMitigationType	BID Type: I – Initial Bid; F – Final Bid
mitigationStatus	0..1	BidMitigationStatus	Mitigation Status: 'S' – Mitigated by SMPM because of "misconduct" 'L'; – Mitigated by LMPM because of "misconduct" 'R' – Modified by LMPM because of RMR rules 'M' – Mitigated because of "misconduct" both by SMPM and LMPM 'B' – Mitigated because of "misconduct" both by SMPM and modified by LMLM because of RMR rules 'O' – original
endTime	0..1	DateTime	inherited from: RegularIntervalSchedule
timeStep	0..1	Seconds	inherited from: RegularIntervalSchedule
startTime	0..1	DateTime	inherited from: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value1Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value2Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 445 shows all association ends of BidPriceSchedule with other classes.

Table 445 – Association ends of ParticipantInterfaces::BidPriceSchedule with other classes

mult from	name	mult to	type	description
0..*	BidPriceCurve	1..1	BidPriceCurve	
0..*	ProductBid	1..1	ProductBid	
1..1	TimePoints	1..*	RegularTimePoint	inherited from: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.12 BidSelfSched

Defines self schedule values to be used for specified time intervals.

Table 446 shows all attributes of BidSelfSched.

Table 446 – Attributes of ParticipantInterfaces::BidSelfSched

name	mult	type	description
balancingFlag	0..1	YesNo	This is a Y/N flag for a self-schedule of a resource per market per date and hour, using a specific TR ID. It indicates whether a self-schedule using a TR is balanced with another self-schedule using the same TR ID.
bidType	0..1	BidTypeRMR	bidType has two types as the required output of requirements and qualified pre-dispatch.
priorityFlag	0..1	YesNo	This is a Y/N flag for a self-schedule of a resource per market per date and hour, using a specific TR ID. It indicates whether a self-schedule using a TR has scheduling priority in DAM/RTM.
pumpSelfSchedMw	0..1	Float	Contains the PriceTaker, ExistingTransmissionContract, TransmissionOwnershipRights pumping self schedule quantity. If this value is not null, then the unit is in pumping mode.
referenceType	0..1	SelfSchedReferenceType	Indication of which type of self schedule is being referenced.
selfSchedMw	0..1	Float	Self scheduled value
selfSchedSptResource	0..1	String	Price Taker Export Self Sched Support Resource
selfSchedType	0..1	MarketProductSelfSchedType	This attribute is used to specify if a bid includes a self sched bid. If so what self sched type is it. The possible values are shown as follow but not limited to: 'ETC' – Existing transmission contract 'TOR' – Transmission ownership right 'RMR' – Reliability must run 'RGMR' – Regulatory must run "RMT" – Reliability must take "PT" – Price taker "LPT" – Low price taker "SP" – Self provision "RA" – Resource adequacy This attribute is originally defined in the BidSelfSched class
updateType	0..1	MQSCHGType	
wheelingTransactionReference	0..1	String	A unique identifier of a wheeling transaction. A wheeling transaction is a balanced Energy exchange among Supply and Demand Resources.
endTime	0..1	DateTime	inherited from: RegularIntervalSchedule
timeStep	0..1	Seconds	inherited from: RegularIntervalSchedule
startTime	0..1	DateTime	inherited from: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value1Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value2Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 447 shows all association ends of BidSelfSched with other classes.

Table 447 – Association ends of ParticipantInterfaces::BidSelfSched with other classes

mult from	name	mult to	type	description
0..*	TransmissionContractRight	0..1	ContractRight	
0..*	AdjacentCaset	0..1	AdjacentCaset	
0..*	HostControlArea	0..1	HostControlArea	
0..*	SubControlArea	0..1	SubControlArea	
0..*	ProductBid	1..1	ProductBid	
1..1	TimePoints	1..*	RegularTimePoint	inherited from: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.13 BidSet

As set of mutually exclusive bids for which a maximum of one may be scheduled.

Of these generating bids, only one generating bid can be scheduled at a time.

Table 448 shows all attributes of BidSet.

Table 448 – Attributes of ParticipantInterfaces::BidSet

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 449 shows all association ends of BidSet with other classes.

Table 449 – Association ends of ParticipantInterfaces::BidSet with other classes

mult from	name	mult to	type	description
0..1	GeneratingBids	1..*	GeneratingBid	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.14 ChargeComponent

A Charge Component is a list of configurable charge quality items to feed into settlement calculation and/or bill determinants.

Table 450 shows all attributes of ChargeComponent.

Table 450 – Attributes of ParticipantInterfaces::ChargeComponent

name	mult	type	description
deleteStatus	0..1	String	
effectiveDate	0..1	DateTime	
terminationDate	0..1	DateTime	
message	0..1	String	
type	0..1	String	
sum	0..1	String	
roundOff	0..1	String	
equation	0..1	String	
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 451 shows all association ends of ChargeComponent with other classes.

Table 451 – Association ends of ParticipantInterfaces::ChargeComponent with other classes

mult from	name	mult to	type	description
0..*	BillDeterminants	0..*	BillDeterminant	A BillDeterminant can have 0-n ChargeComponent and a ChargeComponent can associate to 0-n BillDeterminant.
0..*	ChargeTypes	0..*	ChargeType	A ChargeType can have 0-n ChargeComponent and a ChargeComponent can associate to 0-n ChargeType
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.15 ChargeGroup

Charge Group is the grouping of Charge Types for settlement invoicing purpose. Examples such as Ancillary Services, Interests, etc.

Table 452 shows all attributes of ChargeGroup.

Table 452 – Attributes of ParticipantInterfaces::ChargeGroup

name	mult	type	description
marketCode	0..1	String	
effectiveDate	0..1	DateTime	
terminationDate	0..1	DateTime	
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 453 shows all association ends of ChargeGroup with other classes.

Table 453 – Association ends of ParticipantInterfaces::ChargeGroup with other classes

mult from	name	mult to	type	description
0..*	MktUserAttribute	0..*	MktUserAttribute	
0..*	ChargeGroupParent	0..1	ChargeGroup	A ChargeGroup instance can have relationships with other ChargeGroup instances.
0..*	ChargeType	0..*	ChargeType	A ChargeGroup can have 0-n ChargeType. A ChargeType can associate to 0-n ChargeGroup.
0..1	ChargeGroupChild	0..*	ChargeGroup	A ChargeGroup instance can have relationships with other ChargeGroup instances.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.16 ChargeType

Charge Type is the basic level configuration for settlement to process specific charges for invoicing purpose. Examples such as: Day Ahead Spinning Reserve Default Invoice Interest Charge, etc.

Table 454 shows all attributes of ChargeType.

Table 454 – Attributes of ParticipantInterfaces::ChargeType

name	mult	type	description
effectiveDate	0..1	DateTime	
terminationDate	0..1	DateTime	
factor	0..1	String	
chargeOrder	0..1	String	
frequencyType	0..1	String	
chargeVersion	0..1	String	
totalInterval	0..1	String	
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 455 shows all association ends of ChargeType with other classes.

Table 455 – Association ends of ParticipantInterfaces::ChargeType with other classes

mult from	name	mult to	type	description
0..*	MktUserAttribute	0..*	MktUserAttribute	
0..*	ChargeComponents	0..*	ChargeComponent	A ChargeType can have 0-n ChargeComponent and a ChargeComponent can associate to 0-n ChargeType
0..*	ChargeGroup	0..*	ChargeGroup	A ChargeGroup can have 0-n ChargeType. A ChargeType can associate to 0-n ChargeGroup.
0..*	MajorChargeGroup	0..*	MajorChargeGroup	A MajorChargeGroup can have 0-n ChargeType. A ChargeType can associate to 0-n MajorChargeGroup.
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject

mult from	name	mult to	type	description
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.17 DispatchInstReply

Response from registered resource acknowledging receipt of dispatch instructions.

Table 456 shows all attributes of DispatchInstReply.

Table 456 – Attributes of ParticipantInterfaces::DispatchInstReply

name	mult	type	description
acceptMW	0..1	ActivePower	The accepted mw amount by the responder. aka response mw.
acceptStatus	0..1	DispatchResponseType	The accept status submitted by the responder. enumeration type needs to be defined
certificationName	0..1	String	The Subject DN is the X509 Certificate Subject DN. This is the essentially the certificate name presented by the client. In the case of ADS Certificates, this will be the user name. It may be from an API Client or the MP Client (GUI). The Subject ID normally includes more than just the user name (Common Name), it can also contain information such as City, Company ID, etc.
clearedMW	0..1	ActivePower	MW amount associated with instruction. For 5 minute binding dispatches, this is the Goto MW or DOT
instructionTime	0..1	DateTime	The target date/time for the received instruction.
instructionType	0..1	String	instruction type: commitment out of sequence dispatch
passIndicator	0..1	PassIndicatorType	The type of run for the market clearing.
receivedTime	0..1	DateTime	Timestamp indicating the time at which the instruction was received.
startTime	0..1	DateTime	start time
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 457 shows all association ends of DispatchInstReply with other classes.

Table 457 – Association ends of ParticipantInterfaces::DispatchInstReply with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	1..1	RegisteredResource	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.18 EnergyPriceCurve root class

Relationship between a price in \$(or other monetary unit) /hour (Y-axis) and a MW value (X-axis).

Table 458 shows all association ends of EnergyPriceCurve with other classes.

Table 458 – Association ends of ParticipantInterfaces::EnergyPriceCurve with other classes

mult from	name	mult to	type	description
0..*	EnergyTransactions	0..*	EnergyTransaction	

6.5.8.19 GeneratingBid

Offer to supply energy/ancillary services from a generating unit or resource.

Table 459 shows all attributes of GeneratingBid.

Table 459 – Attributes of ParticipantInterfaces::GeneratingBid

name	mult	type	description
combinedCycleUnitOffer	0..1	String	Will indicate if the unit is part of a CC offer or not
downTimeMax	0..1	Float	Maximum down time.
installedCapacity	0..1	Float	Installed Capacity value
lowerRampRate	0..1	ActivePowerChangeRate	Maximum Dn ramp rate in MW/min
maxEmergencyMW	0..1	ActivePower	Power rating available for unit under emergency conditions greater than or equal to maximum economic limit.
maximumEconomicMW	0..1	Float	Maximum high economic MW limit, that should not exceed the maximum operating MW limit
minEmergencyMW	0..1	ActivePower	Minimum power rating for unit under emergency conditions, which is less than or equal to the economic minimum.
minimumEconomicMW	0..1	Float	Low economic MW limit that shall be greater than or equal to the minimum operating MW limit
noLoadCost	0..1	Float	Resource fixed no load cost.
notificationTime	0..1	Float	Time required for crew notification prior to start up of the unit.
operatingMode	0..1	String	Bid operating mode ('C' – cycling, 'F' – fixed, 'M' – must run, 'U' – unavailable)

name	mult	type	description
raiseRampRate	0..1	ActivePowerChangeRate	Maximum Up ramp rate in MW/min
rampCurveType	0..1	Integer	Ramp curve type: 0 – Fixed ramp rate independent of rate function unit MW output 1 – Static ramp rates as a function of unit MW output only 2 – Dynamic ramp rates as a function of unit MW output and ramping time
startupCost	0..1	Float	Startup cost/price
startUpRampRate	0..1	ActivePowerChangeRate	Resource startup ramp rate (MW/minute)
startUpType	0..1	Integer	Resource startup type: 1 – Fixed startup time and fixed startup cost 2 – Startup time as a function of down time and fixed startup cost 3 – Startup cost as a function of down time
upTimeMax	0..1	Float	Maximum up time.
aggregationFlag	0..1	Integer	inherited from: ResourceBid
bidStatus	0..1	String	inherited from: ResourceBid
commodityType	0..1	String	inherited from: ResourceBid
contingencyAvailFlag	0..1	YesNo	inherited from: ResourceBid
createdISO	0..1	YesNo	inherited from: ResourceBid
energyMaxDay	0..1	Float	inherited from: ResourceBid
energyMinDay	0..1	Float	inherited from: ResourceBid
marketSepFlag	0..1	String	inherited from: ResourceBid
minDispatchTime	0..1	Integer	inherited from: ResourceBid
resourceLoadingType	0..1	Integer	inherited from: ResourceBid
shutDownsMaxDay	0..1	Integer	inherited from: ResourceBid
shutDownsMaxWeek	0..1	Integer	inherited from: ResourceBid
startUpsMaxDay	0..1	Integer	inherited from: ResourceBid
startUpsMaxWeek	0..1	Integer	inherited from: ResourceBid
virtual	0..1	Boolean	inherited from: ResourceBid
startTime	0..1	DateTime	inherited from: Bid
stopTime	0..1	DateTime	inherited from: Bid
marketType	0..1	MarketType	inherited from: Bid
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 460 shows all association ends of GeneratingBid with other classes.

Table 460 – Association ends of ParticipantInterfaces::GeneratingBid with other classes

mult from	name	mult to	type	description
0..1	SecurityConstraints	0..*	SecurityConstraints	
1..*	BidSet	0..1	BidSet	
0..*	NotificationTimeCurve	0..1	NotificationTimeCurve	
0..1	RampRateCurve	0..*	RampRateCurve	
0..*	RegisteredGenerator	0..1	RegisteredGenerator	
0..*	StartupCostCurve	0..1	StartupCostCurve	
0..*	StartupTimeCurve	0..1	StartupTimeCurve	
0..*	BidError	0..*	BidError	inherited from: ResourceBid
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: Bid
0..*	EnergyMarket	1..1	EnergyMarket	inherited from: Bid
0..1	ChargeProfiles	0..*	ChargeProfile	inherited from: Bid
1..1	MitigatedBidSegment	0..*	MitigatedBidSegment	inherited from: Bid
0..1	MitigatedBid	0..*	MitigatedBid	inherited from: Bid
0..1	RMRDetermination	0..*	RMRDetermination	inherited from: Bid
0..*	ActionRequest	1..1	ActionRequest	inherited from: Bid
1..1	BidHourlySchedule	0..*	BidHourlySchedule	inherited from: Bid
1..1	ProductBids	1..*	ProductBid	inherited from: Bid
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.20 HourlyPreDispatchSchedule

An indicator specifying that a resource shall have an Hourly Pre-Dispatch. The resource could be a RegisteredGenerator or a RegisteredInterTie.

This schedule is associated with the hourly parameters in a resource bid.

Table 461 shows all attributes of HourlyPreDispatchSchedule.

Table 461 – Attributes of ParticipantInterfaces::HourlyPreDispatchSchedule

name	mult	type	description
value	0..1	Boolean	Flag defining that for this hour in the resource bid the resource shall have an hourly pre-dispatch.
endTime	0..1	DateTime	inherited from: RegularIntervalSchedule
timeStep	0..1	Seconds	inherited from: RegularIntervalSchedule
startTime	0..1	DateTime	inherited from: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value1Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value2Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 462 shows all association ends of HourlyPreDispatchSchedule with other classes.

Table 462 – Association ends of ParticipantInterfaces::HourlyPreDispatchSchedule with other classes

mult from	name	mult to	type	description
0..*	Bid	1..1	Bid	inherited from: BidHourlySchedule
1..1	TimePoints	1..*	RegularTimePoint	inherited from: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.21 InterTieBid

This class represents the inter tie bid.

Table 463 shows all attributes of InterTieBid.

Table 463 – Attributes of ParticipantInterfaces::InterTieBid

name	mult	type	description
minHourlyBlock	0..1	Integer	The minimum hourly block for an Inter-Tie Resource supplied within the bid.
aggregationFlag	0..1	Integer	inherited from: ResourceBid
bidStatus	0..1	String	inherited from: ResourceBid
commodityType	0..1	String	inherited from: ResourceBid
contingencyAvailFlag	0..1	YesNo	inherited from: ResourceBid
createdISO	0..1	YesNo	inherited from: ResourceBid
energyMaxDay	0..1	Float	inherited from: ResourceBid

name	mult	type	description
energyMinDay	0..1	Float	inherited from: ResourceBid
marketSepFlag	0..1	String	inherited from: ResourceBid
minDispatchTime	0..1	Integer	inherited from: ResourceBid
resourceLoadingType	0..1	Integer	inherited from: ResourceBid
shutDownsMaxDay	0..1	Integer	inherited from: ResourceBid
shutDownsMaxWeek	0..1	Integer	inherited from: ResourceBid
startUpsMaxDay	0..1	Integer	inherited from: ResourceBid
startUpsMaxWeek	0..1	Integer	inherited from: ResourceBid
virtual	0..1	Boolean	inherited from: ResourceBid
startTime	0..1	DateTime	inherited from: Bid
stopTime	0..1	DateTime	inherited from: Bid
marketType	0..1	MarketType	inherited from: Bid
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 464 shows all association ends of InterTieBid with other classes.

Table 464 – Association ends of ParticipantInterfaces::InterTieBid with other classes

mult from	name	mult to	type	description
0..1	RegisteredInterTie	0..1	RegisteredInterTie	
0..1	RampRateCurve	0..*	RampRateCurve	
0..*	BidError	0..*	BidError	inherited from: ResourceBid
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: Bid
0..*	EnergyMarket	1..1	EnergyMarket	inherited from: Bid
0..1	ChargeProfiles	0..*	ChargeProfile	inherited from: Bid
1..1	MitigatedBidSegment	0..*	MitigatedBidSegment	inherited from: Bid
0..1	MitigatedBid	0..*	MitigatedBid	inherited from: Bid
0..1	RMRDetermination	0..*	RMRDetermination	inherited from: Bid
0..*	ActionRequest	1..1	ActionRequest	inherited from: Bid
1..1	BidHourlySchedule	0..*	BidHourlySchedule	inherited from: Bid

mult from	name	mult to	type	description
1..1	ProductBids	1..*	ProductBid	inherited from: Bid
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.22 InterTieDispatchResponse root class

Response from an intertie resource acknowledging receipt of dispatch instructions.

Table 465 shows all attributes of InterTieDispatchResponse.

Table 465 – Attributes of ParticipantInterfaces::InterTieDispatchResponse

name	mult	type	description
acceptStatus	0..1	DispatchResponseType	The accept status submitted by the responder. Valid values are NON-RESPONSE, ACCEPT, DECLINE, PARTIAL.
acceptMW	0..1	Float	The accepted mw amount by the responder. aka response mw.
clearedMW	0..1	Float	MW amount associated with instruction. For 5 minute binding dispatches, this is the Goto MW or DOT
startTime	0..1	DateTime	Part of the Composite key that downstream app uses to match the instruction
passIndicator	0..1	PassIndicatorType	Part of the Composite key that downstream app uses to match the instruction

Table 466 shows all association ends of InterTieDispatchResponse with other classes.

Table 466 – Association ends of ParticipantInterfaces::InterTieDispatchResponse with other classes

mult from	name	mult to	type	description
0..*	RegisteredInterTie	1..1	RegisteredInterTie	

6.5.8.23 LoadBid

Offer to supply energy/ancillary services from a load resource (participating load reduces consumption).

Table 467 shows all attributes of LoadBid.

Table 467 – Attributes of ParticipantInterfaces::LoadBid

name	mult	type	description
dropRampRate	0..1	ActivePowerChangeRate	Maximum rate that load can be reduced (MW/minute)
loadRedInitiationCost	0..1	Money	load reduction initiation cost
loadRedInitiationTime	0..1	Float	load reduction initiation time
marketDate	0..1	DateTime	The date represents the NextMarketDate for which the load response bids apply to.
meteredValue	0..1	Boolean	Flag indicated that the load reduction is metered. (See above) If priceSetting and meteredValue both equal 1, then the facility is eligible to set LMP in the real time market.
minLoad	0..1	ActivePower	Minimum MW load below which it may not be reduced.
minLoadReduction	0..1	ActivePower	Minimum MW for a load reduction (e.g. MW rating of a discrete pump).
minLoadReductionCost	0..1	Money	Cost in \$ at the minimum reduced load
minLoadReductionInterval	0..1	Float	Shortest period load reduction shall be maintained before load can be restored to normal levels.
minTimeBetLoadRed	0..1	Float	Shortest time that load shall be left at normal levels before a new load reduction.
pickUpRampRate	0..1	ActivePowerChangeRate	Maximum rate load may be restored (MW/minute)
priceSetting	0..1	Boolean	Flag to indicate that the facility can set LMP Works in tandem with Metered Value. Greater chance of this being dynamic than the Metered Value, however, it is requested that Price Setting and Metered Value stay at the same source. Currently no customers have implemented the metering capability, but if this option is implemented, then Price Setting could become dynamic. However, Metered Value will remain static.
reqNoticeTime	0..1	Float	Time period that is required from an order to reduce a load to the time that it takes to get to the minimum load reduction.
shutdownCost	0..1	Money	The fixed cost associated with committing a load reduction.
aggregationFlag	0..1	Integer	inherited from: ResourceBid
bidStatus	0..1	String	inherited from: ResourceBid
commodityType	0..1	String	inherited from: ResourceBid
contingencyAvailFlag	0..1	YesNo	inherited from: ResourceBid
createdISO	0..1	YesNo	inherited from: ResourceBid
energyMaxDay	0..1	Float	inherited from: ResourceBid
energyMinDay	0..1	Float	inherited from: ResourceBid
marketSepFlag	0..1	String	inherited from: ResourceBid
minDispatchTime	0..1	Integer	inherited from: ResourceBid
resourceLoadingType	0..1	Integer	inherited from: ResourceBid
shutDownsMaxDay	0..1	Integer	inherited from: ResourceBid
shutDownsMaxWeek	0..1	Integer	inherited from: ResourceBid
startUpsMaxDay	0..1	Integer	inherited from: ResourceBid
startUpsMaxWeek	0..1	Integer	inherited from: ResourceBid

name	mult	type	description
virtual	0..1	Boolean	inherited from: ResourceBid
startTime	0..1	DateTime	inherited from: Bid
stopTime	0..1	DateTime	inherited from: Bid
marketType	0..1	MarketType	inherited from: Bid
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 468 shows all association ends of LoadBid with other classes.

Table 468 – Association ends of ParticipantInterfaces::LoadBid with other classes

mult from	name	mult to	type	description
1..1	LoadReductionPriceCurve	0..*	LoadReductionPriceCurve	
0..1	RampRateCurve	0..*	RampRateCurve	
0..*	AreaLoadBid	0..1	AreaLoadBid	
0..*	RegisteredLoad	0..1	RegisteredLoad	
0..*	BidError	0..*	BidError	inherited from: ResourceBid
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: Bid
0..*	EnergyMarket	1..1	EnergyMarket	inherited from: Bid
0..1	ChargeProfiles	0..*	ChargeProfile	inherited from: Bid
1..1	MitigatedBidSegment	0..*	MitigatedBidSegment	inherited from: Bid
0..1	MitigatedBid	0..*	MitigatedBid	inherited from: Bid
0..1	RMRDetermination	0..*	RMRDetermination	inherited from: Bid
0..*	ActionRequest	1..1	ActionRequest	inherited from: Bid
1..1	BidHourlySchedule	0..*	BidHourlySchedule	inherited from: Bid
1..1	ProductBids	1..*	ProductBid	inherited from: Bid
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document

mult from	name	mult to	type	description
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.24 LoadFollowingInst root class

Metered SubSystem Load Following Instruction.

Table 469 shows all attributes of LoadFollowingInst.

Table 469 – Attributes of ParticipantInterfaces::LoadFollowingInst

name	mult	type	description
mssInstructionID	0..1	String	Unique instruction id per instruction, assigned by the SC and provided to ADS. ADS passes through.
startTime	0..1	DateTime	Instruction Start Time
endTime	0..1	DateTime	Instruction End Time
loadFollowingMW	0..1	Float	Load Following MW Positive for follow-up and negative for follow-down

Table 470 shows all association ends of LoadFollowingInst with other classes.

Table 470 – Association ends of ParticipantInterfaces::LoadFollowingInst with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	1..1	RegisteredResource	

6.5.8.25 LoadReductionPriceCurve

This is the price sensitivity that bidder expresses for allowing market load interruption. Relationship between price (Y1-axis) vs. MW (X-axis).

Table 471 shows all attributes of LoadReductionPriceCurve.

Table 471 – Attributes of ParticipantInterfaces::LoadReductionPriceCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve

name	mult	type	description
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 472 shows all association ends of LoadReductionPriceCurve with other classes.

**Table 472 – Association ends of ParticipantInterfaces::
LoadReductionPriceCurve with other classes**

mult from	name	mult to	type	description
0..*	LoadBid	1..1	LoadBid	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.26 MajorChargeGroup

A Major Charge Group is the same as Invoice Type which provides the highest level of grouping for charge types configuration. Examples: Market, FERC, RMR.

Table 473 shows all attributes of MajorChargeGroup.

Table 473 – Attributes of ParticipantInterfaces::MajorChargeGroup

name	mult	type	description
runType	0..1	String	
runVersion	0..1	String	
frequencyType	0..1	String	
invoiceType	0..1	String	
effectiveDate	0..1	DateTime	
terminationDate	0..1	DateTime	
requireAutorun	0..1	String	
revisionNumber	0..1	String	Revision number for the major charge group
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 474 shows all association ends of MajorChargeGroup with other classes.

Table 474 – Association ends of ParticipantInterfaces::MajorChargeGroup with other classes

mult from	name	mult to	type	description
1..*	Settlement	0..*	Settlement	
0..*	ChargeType	0..*	ChargeType	A MajorChargeGroup can have 0-n ChargeType. A ChargeType can associate to 0-n MajorChargeGroup.
0..1	MktScheduledEvent	0..*	MarketScheduledEvent	
1..*	MarketInvoice	0..*	MarketInvoice	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.27 MarketScheduledEvent

Signifies an event to trigger one or more activities, such as reading a meter, recalculating a bill, requesting work, when generating units shall be scheduled for maintenance, when a transformer is scheduled to be refurbished, etc.

Table 475 shows all attributes of MarketScheduledEvent.

Table 475 – Attributes of ParticipantInterfaces::MarketScheduledEvent

name	mult	type	description
category	0..1	String	Category of scheduled event.
duration	0..1	Seconds	Duration of the scheduled event, for example, the time to ramp between values.
status	0..1	Status	
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 476 shows all association ends of MarketScheduledEvent with other classes.

Table 476 – Association ends of ParticipantInterfaces::MarketScheduledEvent with other classes

mult from	name	mult to	type	description
0..*	MajorChargeGroup	0..1	MajorChargeGroup	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.28 NotificationTimeCurve

Notification time curve as a function of down time. Relationship between crew notification time (Y1-axis) and unit startup time (Y2-axis) vs. unit elapsed down time (X-axis).

Table 477 shows all attributes of NotificationTimeCurve.

Table 477 – Attributes of ParticipantInterfaces::NotificationTimeCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 478 shows all association ends of NotificationTimeCurve with other classes.

Table 478 – Association ends of ParticipantInterfaces::NotificationTimeCurve with other classes

mult from	name	mult to	type	description
0..1	GeneratingBids	0..*	GeneratingBid	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.29 OpenTieSchedule

Result of bid validation against conditions that may exist on an interchange that becomes disconnected or is heavily discounted with respect the MW flow.

This schedule is associated with the hourly parameters in a resource bid.

Table 479 shows all attributes of OpenTieSchedule.

Table 479 – Attributes of ParticipantInterfaces::OpenTieSchedule

name	mult	type	description
value	0..1	Boolean	
endTime	0..1	DateTime	inherited from: RegularIntervalSchedule
timeStep	0..1	Seconds	inherited from: RegularIntervalSchedule
startTime	0..1	DateTime	inherited from: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value1Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value2Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 480 shows all association ends of OpenTieSchedule with other classes.

Table 480 – Association ends of ParticipantInterfaces::OpenTieSchedule with other classes

mult from	name	mult to	type	description
0..*	Bid	1..1	Bid	inherited from: BidHourlySchedule
1..1	TimePoints	1..*	RegularTimePoint	inherited from: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.30 ProductBid

Component of a bid that pertains to one market product.

Table 481 shows all attributes of ProductBid.

Table 481 – Attributes of ParticipantInterfaces::ProductBid

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 482 shows all association ends of ProductBid with other classes.

Table 482 – Association ends of ParticipantInterfaces::ProductBid with other classes

mult from	name	mult to	type	description
1..*	Bid	1..1	Bid	A bid comprises one or more product bids of market products
1..1	BidDistributionFactor	0..*	BidDistributionFactor	
1..1	BidSchedule	0..*	BidPriceSchedule	
1..1	BidSelfSched	0..*	BidSelfSched	
0..*	MarketProduct	1..1	MarketProduct	
1..1	BidHourlyProductSchedule	0..*	BidHourlyProductSchedule	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.31 PumpingCostSchedule

The operating cost of a Pump Storage Hydro Unit operating as a hydro pump.

This schedule is associated with the hourly parameters in a resource bid associated with a specific product within the bid.

Table 483 shows all attributes of PumpingCostSchedule.

Table 483 – Attributes of ParticipantInterfaces::PumpingCostSchedule

name	mult	type	description
value	0..1	Float	
endTime	0..1	DateTime	inherited from: RegularIntervalSchedule
timeStep	0..1	Seconds	inherited from: RegularIntervalSchedule
startTime	0..1	DateTime	inherited from: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value1Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value2Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 484 shows all association ends of PumpingCostSchedule with other classes.

Table 484 – Association ends of ParticipantInterfaces::PumpingCostSchedule with other classes

mult from	name	mult to	type	description
0..*	ProductBid	1..1	ProductBid	inherited from: BidHourlyProductSchedule
1..1	TimePoints	1..*	RegularTimePoint	inherited from: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.32 PumpingLevelSchedule

The fixed operating level of a Pump Storage Hydro Unit operating as a hydro pump. Associated with the energy market product type.

This schedule is associated with the hourly parameters in a resource bid associated with a specific product within the bid.

Table 485 shows all attributes of PumpingLevelSchedule.

Table 485 – Attributes of ParticipantInterfaces::PumpingLevelSchedule

name	mult	type	description
value	0..1	Float	
endTime	0..1	DateTime	inherited from: RegularIntervalSchedule
timeStep	0..1	Seconds	inherited from: RegularIntervalSchedule
startTime	0..1	DateTime	inherited from: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value1Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value2Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 486 shows all association ends of PumpingLevelSchedule with other classes.

Table 486 – Association ends of ParticipantInterfaces::PumpingLevelSchedule with other classes

mult from	name	mult to	type	description
0..*	ProductBid	1..1	ProductBid	inherited from: BidHourlyProductSchedule
1..1	TimePoints	1..*	RegularTimePoint	inherited from: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.33 PumpingShutDownCostSchedule

The cost to shutdown a Pump Storage Hydro Unit (in pump mode) or a pump.

This schedule is associated with the hourly parameters in a resource bid associated with a specific product within the bid.

Table 487 shows all attributes of PumpingShutDownCostSchedule.

Table 487 – Attributes of ParticipantInterfaces::PumpingShutDownCostSchedule

name	mult	type	description
value	0..1	Float	
endTime	0..1	DateTime	inherited from: RegularIntervalSchedule
timeStep	0..1	Seconds	inherited from: RegularIntervalSchedule
startTime	0..1	DateTime	inherited from: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value1Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	inherited from: BasicIntervalSchedule
value2Unit	0..1	UnitSymbol	inherited from: BasicIntervalSchedule
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 488 shows all association ends of PumpingShutDownCostSchedule with other classes.

Table 488 – Association ends of ParticipantInterfaces::PumpingShutDownCostSchedule with other classes

mult from	name	mult to	type	description
0..*	ProductBid	1..1	ProductBid	inherited from: BidHourlyProductSchedule
1..1	TimePoints	1..*	RegularTimePoint	inherited from: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.34 RampRateCurve

Ramp rate as a function of resource MW output.

Table 489 shows all attributes of RampRateCurve.

Table 489 – Attributes of ParticipantInterfaces::RampRateCurve

name	mult	type	description
condition	0..1	RampRateCondition	condition for the ramp rate
constraintRampType	0..1	ConstraintRampType	The condition that identifies whether a Generating Resource should be constrained from Ancillary Service provision if its Schedule or Dispatch change across Trading Hours or Trading Intervals requires more than a specified fraction of the duration of the Trading Hour or Trading Interval. Valid values are Fast/Slow
rampRateType	0..1	RampRateType	How ramp rate is applied (e.g. raise or lower, as when applied to a generation resource)
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 490 shows all association ends of RampRateCurve with other classes.

Table 490 – Association ends of ParticipantInterfaces::RampRateCurve with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..*	RegisteredResource	
0..*	GeneratingBid	0..1	GeneratingBid	
0..*	InterTieBid	0..1	InterTieBid	
0..*	LoadBid	0..1	LoadBid	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.35 ResourceBid

Energy bid for generation, load, or virtual type for the whole of the market-trading period (i.e., one day in day ahead market or one hour in the real time market).

Table 491 shows all attributes of ResourceBid.

Table 491 – Attributes of ParticipantInterfaces::ResourceBid

name	mult	type	description
aggregationFlag	0..1	Integer	Aggregation flag 0: individual resource level 1: Aggregated node location 2: Aggregated price location)
bidStatus	0..1	String	
commodityType	0..1	String	Energy product (commodity) type: 'En' – Energy 'Ru' – Regulation Up 'Rd' – Regulation Dn 'Sr' – Spinning Reserve 'Nr' – Non-Spinning Reserve 'Or' – Operating Reserve
contingencyAvailFlag	0..1	YesNo	contingent operating reserve availability (Yes/No). Resource is available to participate with capacity only in contingency dispatch.
createdISO	0..1	YesNo	A Yes indicates that this bid was created by the ISO.
energyMaxDay	0..1	Float	Maximum amount of energy per day which can be produced during the trading period in MWh
energyMinDay	0..1	Float	Minimum amount of energy per day which has to be produced during the trading period in MWh
marketSepFlag	0..1	String	Market Separation Flag 'Y' – Enforce market separation constraints for this bid 'N' – Do not enforce market separation constraints for this bid.

name	mult	type	description
minDispatchTime	0..1	Integer	minimum number of consecutive hours a resource shall be dispatched if bid is accepted
resourceLoadingType	0..1	Integer	Resource loading curve type 1 – step-wise continuous loading 2 – piece-wise linear continuous loading 3 – block loading
shutDownsMaxDay	0..1	Integer	Maximum number of shutdowns per day.
shutDownsMaxWeek	0..1	Integer	Maximum number of shutdowns per week.
startUpsMaxDay	0..1	Integer	Maximum number of startups per day.
startUpsMaxWeek	0..1	Integer	Maximum number of startups per week.
virtual	0..1	Boolean	True if bid is virtual. Bid is assumed to be non-virtual if attribute is absent
startTime	0..1	DateTime	inherited from: Bid
stopTime	0..1	DateTime	inherited from: Bid
marketType	0..1	MarketType	inherited from: Bid
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 492 shows all association ends of ResourceBid with other classes.

Table 492 – Association ends of ParticipantInterfaces::ResourceBid with other classes

mult from	name	mult to	type	description
0..*	BidError	0..*	BidError	
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: Bid
0..*	EnergyMarket	1..1	EnergyMarket	inherited from: Bid
0..1	ChargeProfiles	0..*	ChargeProfile	inherited from: Bid
1..1	MitigatedBidSegment	0..*	MitigatedBidSegment	inherited from: Bid
0..1	MitigatedBid	0..*	MitigatedBid	inherited from: Bid
0..1	RMRDetermination	0..*	RMRDetermination	inherited from: Bid
0..*	ActionRequest	1..1	ActionRequest	inherited from: Bid
1..1	BidHourlySchedule	0..*	BidHourlySchedule	inherited from: Bid

mult from	name	mult to	type	description
1..1	ProductBids	1..*	ProductBid	inherited from: Bid
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.36 StartUpCostCurve

Startup costs and time as a function of down time. Relationship between unit startup cost (Y1-axis) vs. unit elapsed down time (X-axis).

Table 493 shows all attributes of StartUpCostCurve.

Table 493 – Attributes of ParticipantInterfaces::StartUpCostCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 494 shows all association ends of StartUpCostCurve with other classes.

Table 494 – Association ends of ParticipantInterfaces::StartUpCostCurve with other classes

mult from	name	mult to	type	description
0..1	GeneratingBid	0..*	GeneratingBid	
0..*	RegisteredGenerators	0..*	RegisteredGenerator	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.37 StartUpTimeCurve

Startup time curve as a function of down time, where time is specified in minutes. Relationship between unit startup time (Y1-axis) vs. unit elapsed down time (X-axis).

Table 495 shows all attributes of StartUpTimeCurve.

Table 495 – Attributes of ParticipantInterfaces::StartUpTimeCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 496 shows all association ends of StartUpTimeCurve with other classes.

**Table 496 – Association ends of ParticipantInterfaces::
StartupTimeCurve with other classes**

mult from	name	mult to	type	description
0..1	GeneratingBid	0..*	GeneratingBid	
0..1	RegisteredGenerator	0..1	RegisteredGenerator	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.38 Trade

Inter Scheduling Coordinator Trades to model financial trades which may impact settlement.

Table 497 shows all attributes of Trade.

Table 497 – Attributes of ParticipantInterfaces::Trade

name	mult	type	description
adjustedTradeQuantity	0..1	Float	The validated and current market accepted trade amount of a physical energy trade.
counterTradeQuantity	0..1	Float	MW quantity submitted by counter SC for the same trade
dependOnTradeName	0..1	String	The Depend On IST Name points to the unique IST Name in the chain of physical energy trades.
lastModified	0..1	DateTime	Time and date the trade was last modified.
marketType	0..1	MarketType	
startTime	0..1	DateTime	Start time and date for which trade applies.
stopTime	0..1	DateTime	Stop time and date for which trade is applicable.
submitFromTimeStamp	0..1	DateTime	Timestamp of submittal of submit From Scheduling Coordinator Trade to Market Participant Bid Submittal
submitFromUser	0..1	String	Userid of the submit From Scheduling Coordinator trade
submitToTimeStamp	0..1	DateTime	Timestamp of submittal of submit To Scheduling Coordinator Trade to Market Participant Bid Submittal
submitToUser	0..1	String	Userid of the submit To Scheduling Coordinator trade
tradeQuantity	0..1	Float	tradeQuantity: If tradeType = IST, The amount of an Energy Trade. If tradeType = AST, The amount of an Ancillary Service Obligation Trade. If tradeType = UCT, The amount of a Unit Commitment Obligation Trade.
tradeStatus	0..1	String	Resulting status of the trade following the rule engine processing.
updateTimeStamp	0..1	DateTime	

name	mult	type	description
updateUser	0..1	String	
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 498 shows all association ends of Trade with other classes.

Table 498 – Association ends of ParticipantInterfaces::Trade with other classes

mult from	name	mult to	type	description
0..1	TradeError	0..*	TradeError	
0..*	ActionRequest	1..1	ActionRequest	
0..*	Pnode	0..1	Pnode	
0..*	submitToSchedulingCoordinator	0..1	SchedulingCoordinator	
0..*	To_SC	1..1	SchedulingCoordinator	
0..*	From_SC	1..1	SchedulingCoordinator	
0..*	submitFromSchedulingCoordinator	0..1	SchedulingCoordinator	
0..*	RegisteredGenerator	0..1	RegisteredGenerator	
0..*	TradeProduct	1..1	TradeProduct	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject

6.5.8.39 TradeError

Trade error and warning messages associated with the rule engine processing of the submitted trade.

Table 499 shows all attributes of TradeError.

Table 499 – Attributes of ParticipantInterfaces::TradeError

name	mult	type	description
errPriority	0..1	Integer	Priority number for the error message
errMessage	0..1	String	error message
ruleID	0..1	Integer	Rule identifier which triggered the error/warning message
startTime	0..1	DateTime	hour within the trade for which the error applies
endTime	0..1	DateTime	hour within the trade for which the error applies
logTimeStamp	0..1	DateTime	Timestamp of logged error/warning message
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 500 shows all association ends of TradeError with other classes.

Table 500 – Association ends of ParticipantInterfaces::TradeError with other classes

mult from	name	mult to	type	description
0..*	Trade	0..1	Trade	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.8.40 TradeProduct root class

TradeType	TradeProduct
IST (InterSC Trade)	PHY (Physical Energy Trade)
IST	APN (Energy Trades at Aggregated Pricing Nodes)
IST	CPT (Converted Physical Energy Trade)
AST (Ancillary Services Trade)	RUT (Regulation Up Trade)
AST	RDT (Regulation Down Trade)
AST	SRT (Spinning Reserve Trade)
AST	NRT (Non-Spinning Reserve Trade)
UCT (Unit Commitment Trade)	null

Table 501 shows all attributes of TradeProduct.

Table 501 – Attributes of ParticipantInterfaces::TradeProduct

name	mult	type	description
tradeType	0..1	TradeType	IST – InterSC Trade; AST – Ancillary Services Trade; UCT – Unit Commitment Trade
tradeProductType	0..1	String	PHY (Physical Energy Trade); APN (Energy Trades at Aggregated Pricing Nodes); CPT (Converted Physical Energy Trade); RUT (Regulation Up Trade); RDT (Regulation Down Trade); SRT (Spinning Reserve Trade); NRT (Non-Spinning Reserve Trade)

Table 502 shows all association ends of TradeProduct with other classes.

Table 502 – Association ends of ParticipantInterfaces::TradeProduct with other classes

mult from	name	mult to	type	description
1..1	Trade	0..*	Trade	

6.5.8.41 TransactionBid

Bilateral or scheduled transactions for energy and ancillary services considered by market clearing process.

Table 503 shows all attributes of TransactionBid.

Table 503 – Attributes of ParticipantInterfaces::TransactionBid

name	mult	type	description
demandTransaction	0..1	Boolean	Set true if this is a demand transaction.
dispatchable	0..1	Boolean	Set true if this is a dispatchable transaction.
payCongestion	0..1	Boolean	Set true if this is a willing to pay transaction. This flag is used to determine whether a schedule is willing-to-pay-congestion or not.
startTime	0..1	DateTime	inherited from: Bid
stopTime	0..1	DateTime	inherited from: Bid
marketType	0..1	MarketType	inherited from: Bid
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 504 shows all association ends of TransactionBid with other classes.

Table 504 – Association ends of ParticipantInterfaces::TransactionBid with other classes

mult from	name	mult to	type	description
1..1	EnergyProfiles	1..*	EnergyProfile	
0..1	TransmissionReservation	0..1	TransmissionReservation	
0..1	TransactionBidResults	0..*	TransactionBidResults	
0..*	Receipt_Pnode	0..1	Pnode	
0..*	Delivery_Pnode	0..1	Pnode	
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: Bid
0..*	EnergyMarket	1..1	EnergyMarket	inherited from: Bid
0..1	ChargeProfiles	0..*	ChargeProfile	inherited from: Bid
1..1	MitigatedBidSegment	0..*	MitigatedBidSegment	inherited from: Bid
0..1	MitigatedBid	0..*	MitigatedBid	inherited from: Bid
0..1	RMRDetermination	0..*	RMRDetermination	inherited from: Bid
0..*	ActionRequest	1..1	ActionRequest	inherited from: Bid
1..1	BidHourlySchedule	0..*	BidHourlySchedule	inherited from: Bid
1..1	ProductBids	1..*	ProductBid	inherited from: Bid
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9 Package ReferenceData

6.5.9.1 General

Market static reference data.

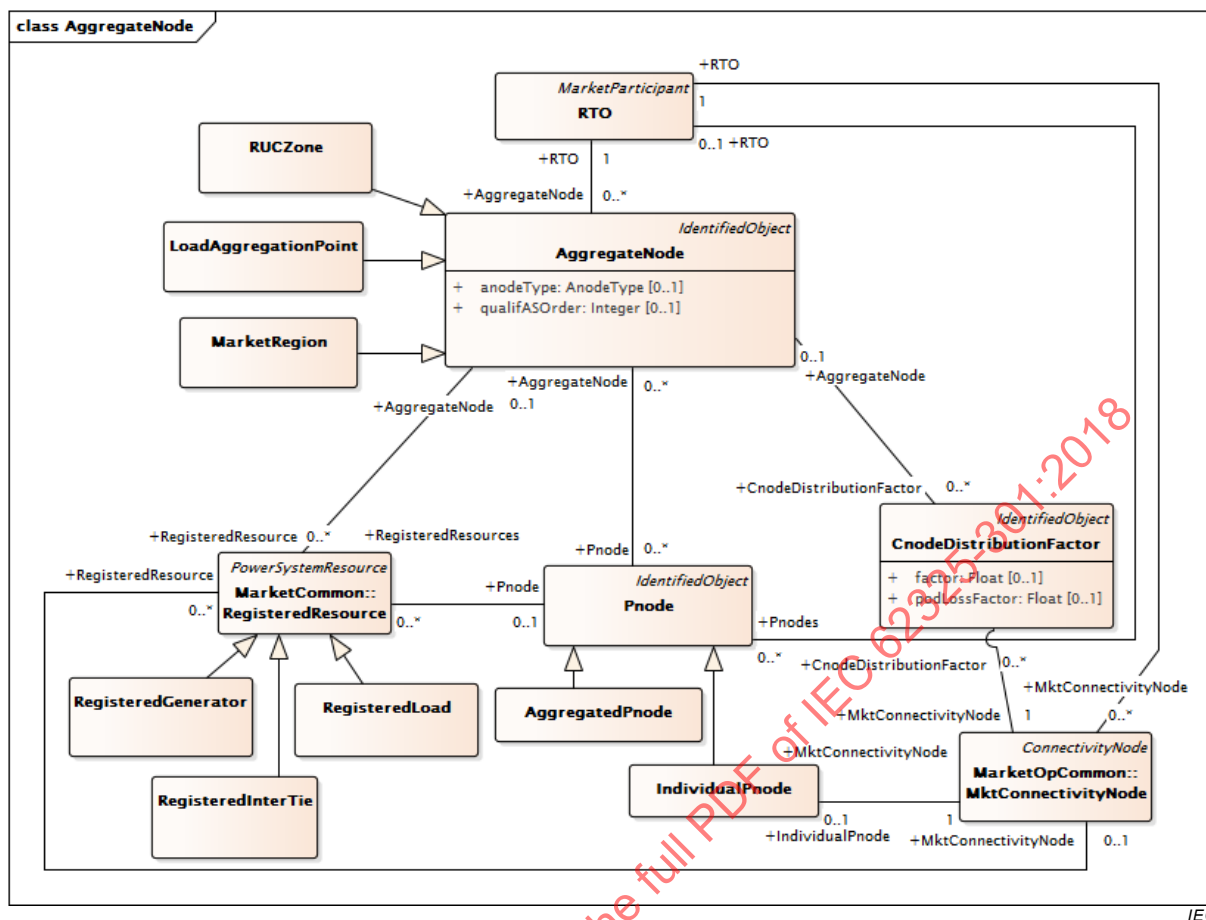


Figure 59 – Class diagram ReferenceData::AggregateNode

Figure 59: Shows classes and associations used to model aggregate nodes. The aggregated node allows a grouping of Pnode and Cnodes that is further defined by AnodeType. Reliability Unit Commitment zones are modeled by the RUCZone subclass. Load aggregation points are modeled by the LoadAggregationPoint subclass, and market regions by the MarketRegion subclass. Registered resources are associated with Aggregated nodes.



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Figure 60: Shows the classes and associations used to model Contract rights. The class ContractRight is used to summarize contract information. Types of contracts include Existing Transmission Contracts (ETC), Transmission Ownership Rights (TOR), Reliability Must Run (RMR) and Reliability Must Take (RMT). ETCs and TOR represent grandfathered transmission use contracts that exist at the time of startup of an ISO. RMR and RMT affect generation. The figure shows associations with the TransmissionRightChain which may be used to model chaining of ETCs and with Scheduling Coordinators. Associations are also included to model distribution to sources and sinks (the Contract DistributionFactor class) and to registered resources (RegisteredResource class).

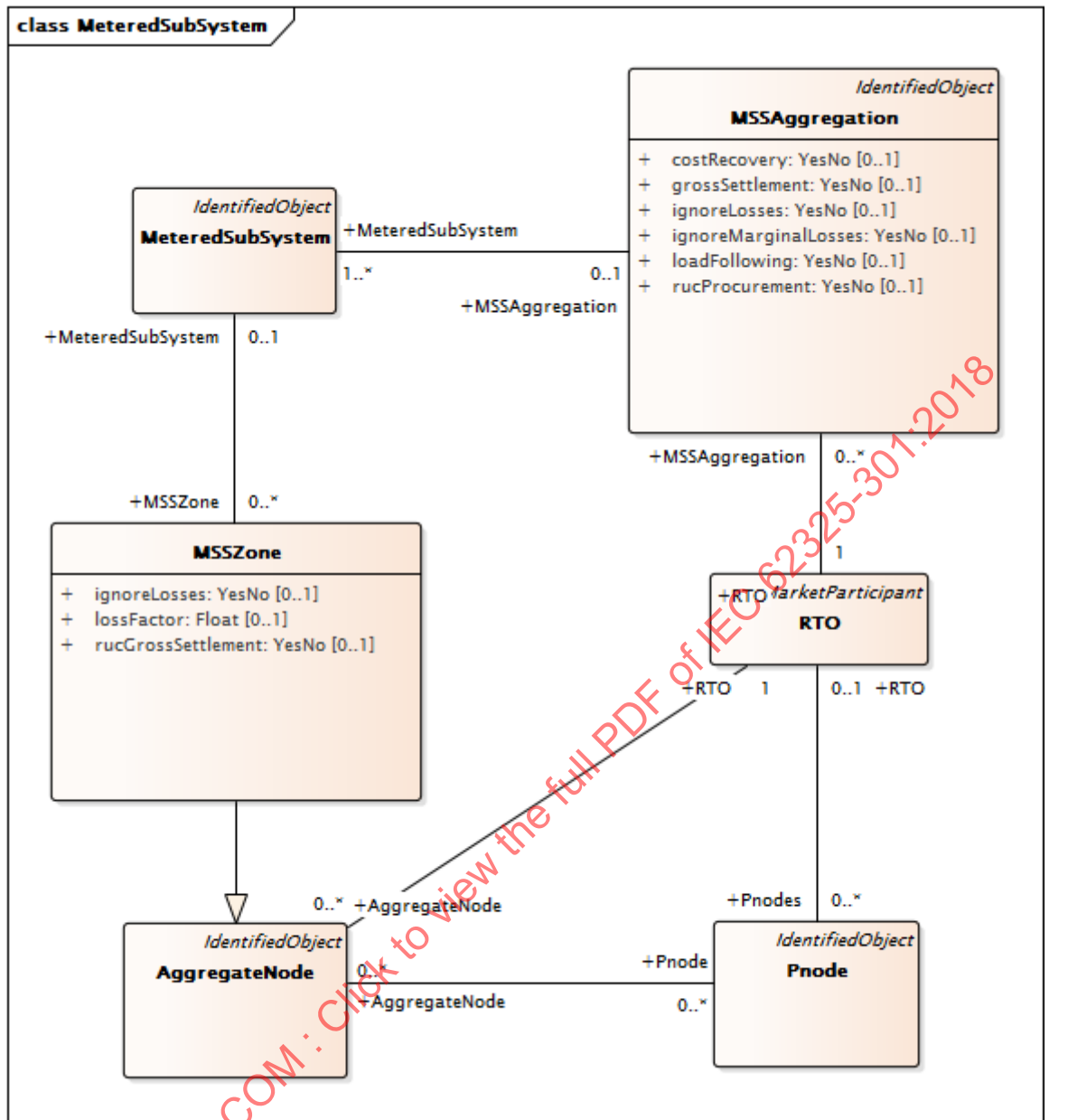


Figure 61 – Class diagram ReferenceData::MeteredSubSystem

Figure 61: Shows the classes and associations used to model metered subsystems. A metered subsystem (MSS) is a geographically contiguous system which was historically operated as a separate control area and which is now operated in accordance with a MSS agreement. Associations are shown with the class MSSZone which is used to model zones with an MSS. MSSZone is subtype of the Aggregated Node.

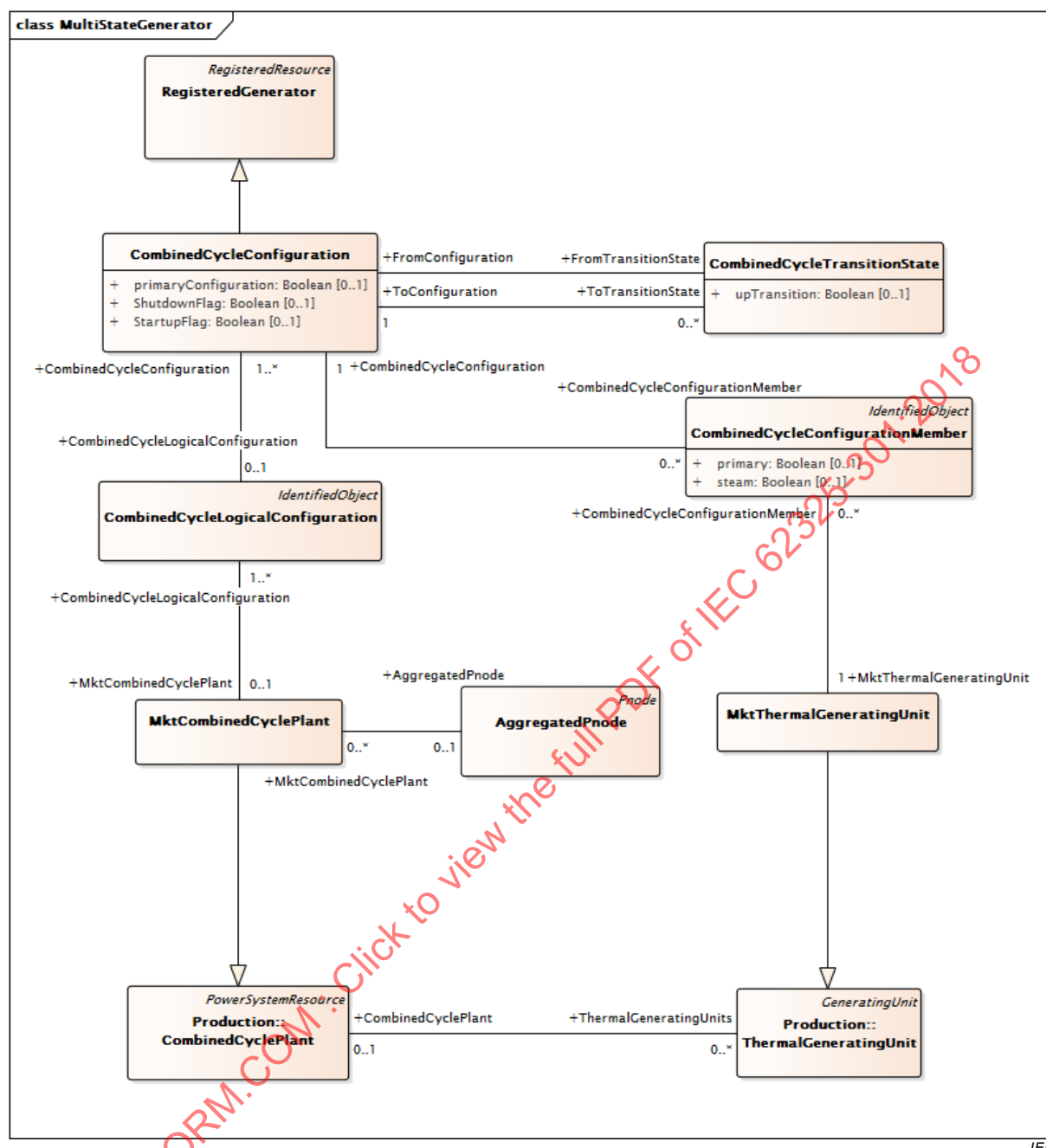
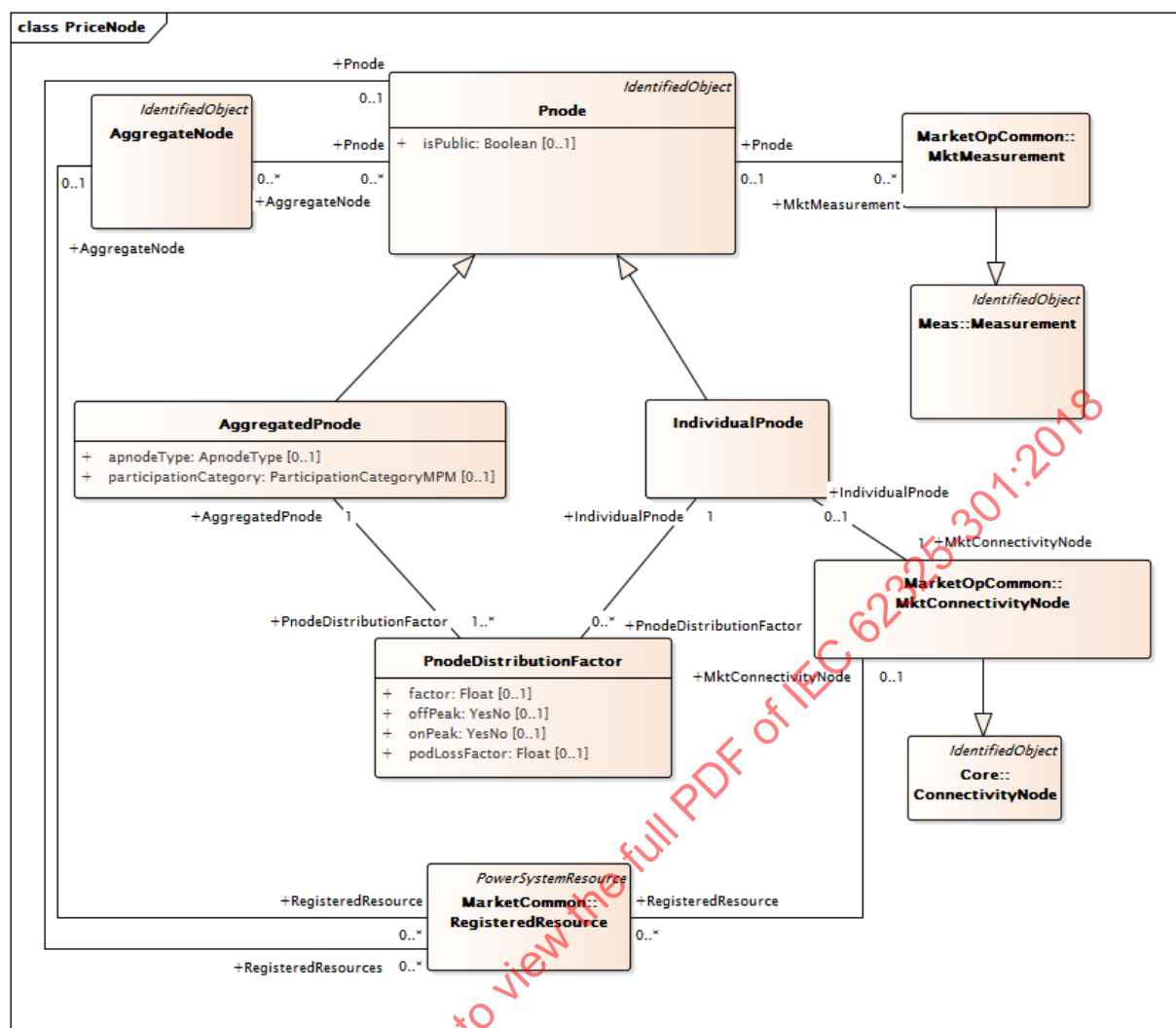


Figure 62 – Class diagram ReferenceData::MultiStateGenerator

Figure 62: Shows the classes and associations used to model MultiState Generating Units, such as combined cycle plants. The combined cycle plant is associated with the LogicalConfiguration class, the Configuration class and the ConfigurationMember class which are used to model the various modes of operation of the plant. The MktCombinedCyclePlant and the MktThermalGeneratingUnit classes are subclasses of the parent classes from IEC 61970 Production package.



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Figure 63 – Class diagram ReferenceData::PriceNode

Figure 63: Shows the classes and associations used to model pricing nodes. The pricing node is referenced by market participants, in bids/offers for energy, ancillary services, and CRRs. AggregatePnodes and IndividualPnodes are subclasses of the Pnode class. Pnodes are associated with registered resources and used in bids/offers. Pnodes are also associated with the MktMeasurement class which is used in Billing and Settlement.

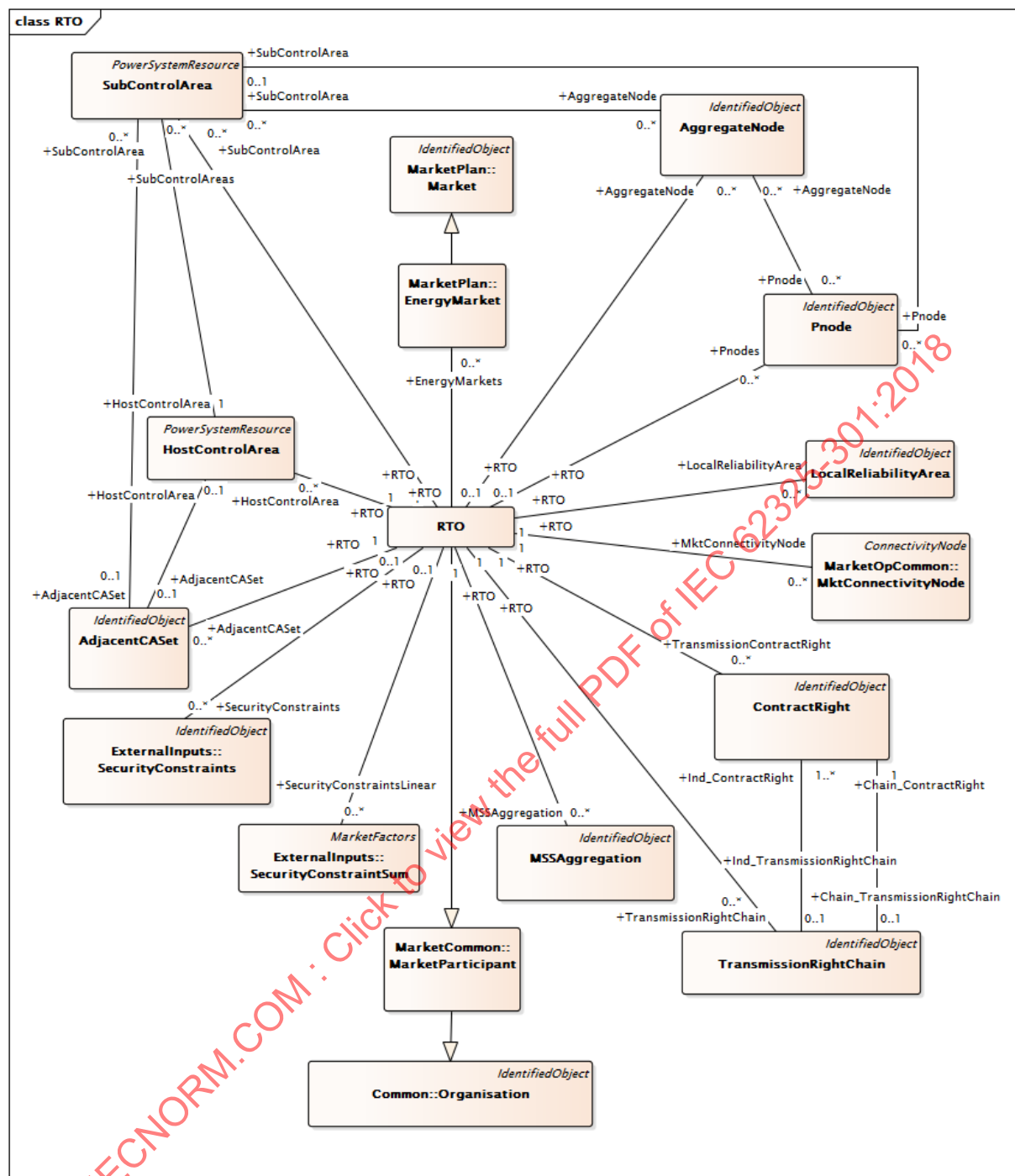


Figure 64 – Class diagram ReferenceData::RTO

Figure 64: Shows the classes and associations used to model a Regional Transmission Organization that operates an electricity market. The major classes and relationships are shown at an overview level. Supporting figures appear throughout the standard.

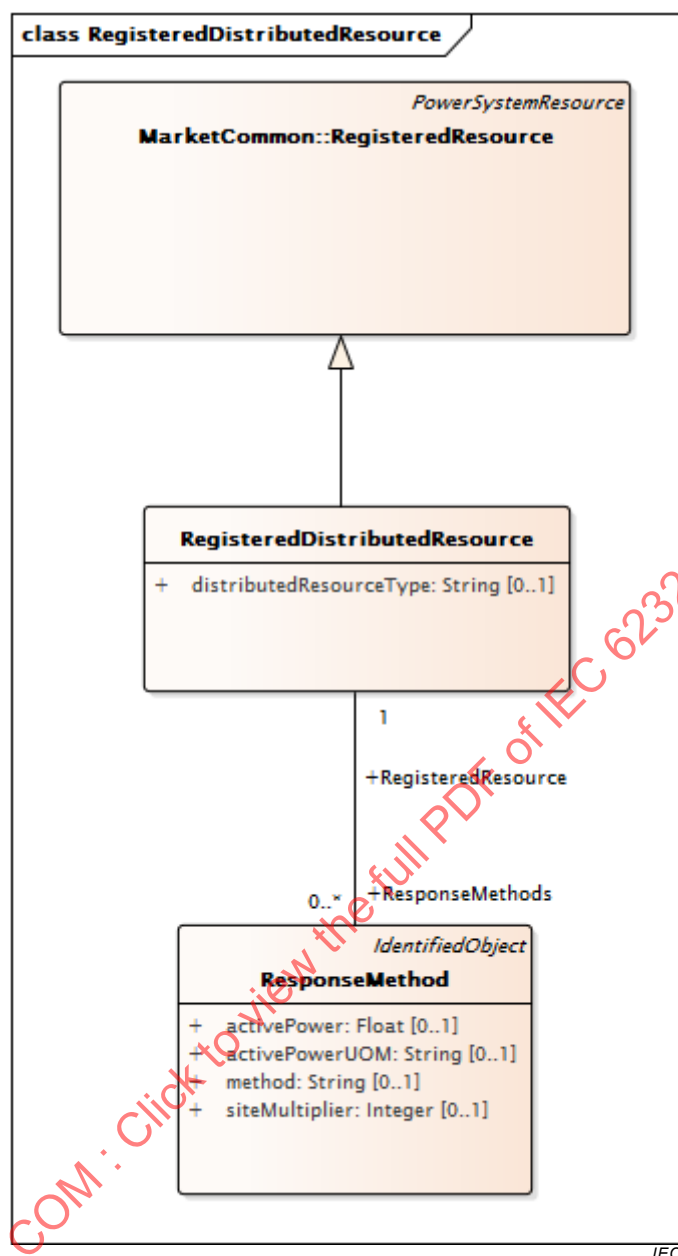


Figure 65 – Class diagram ReferenceData::RegisteredDistributedResource

Figure 65: Illustrates the classes and associations used to model registered distributed resources. RegisteredDistributedResources may represent demand response resources, storage resources, distribution generation resources, etc. RegisteredDistributedResource inherits from RegisteredResource and may be associated to ResponseMethods.

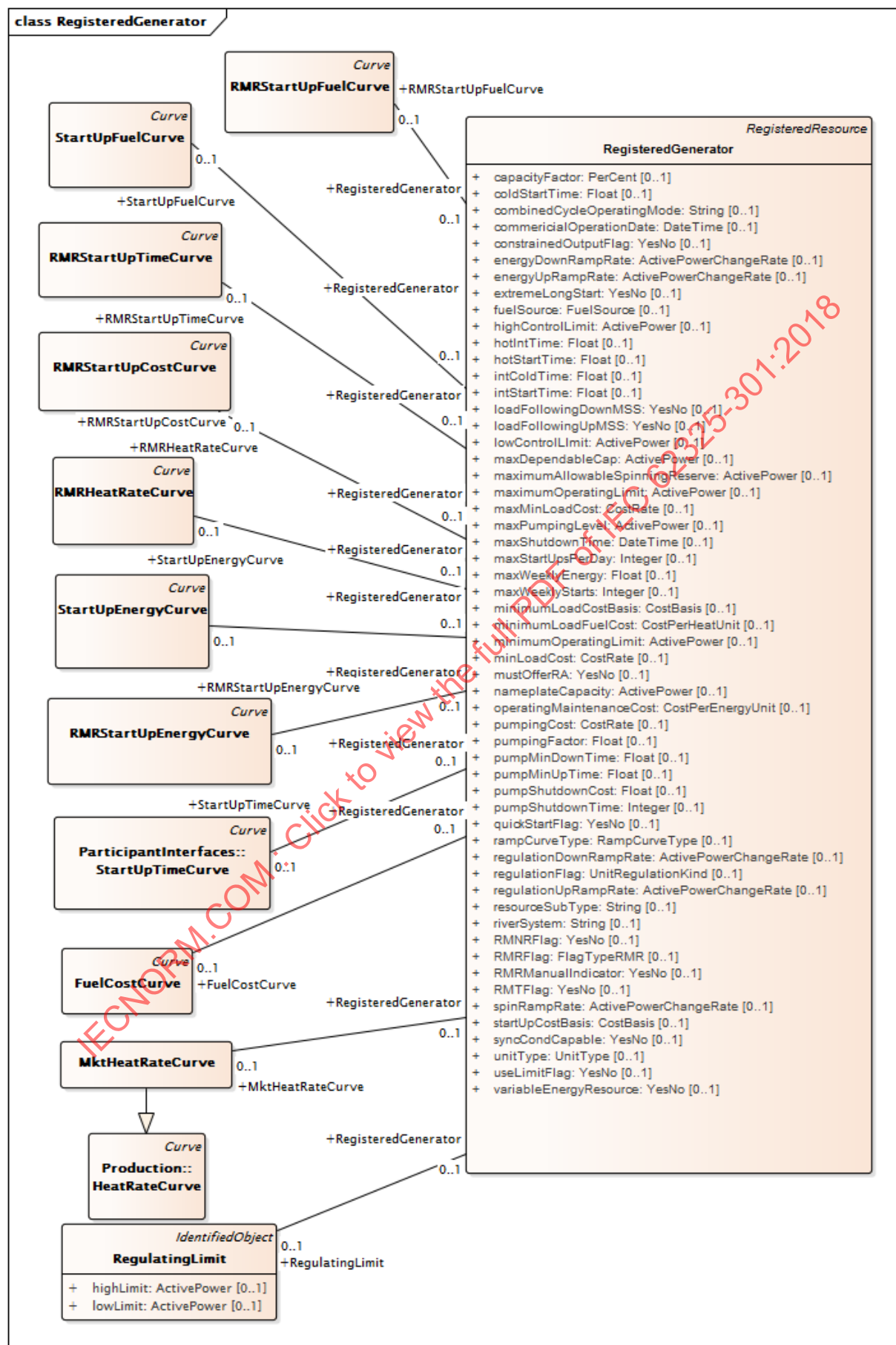
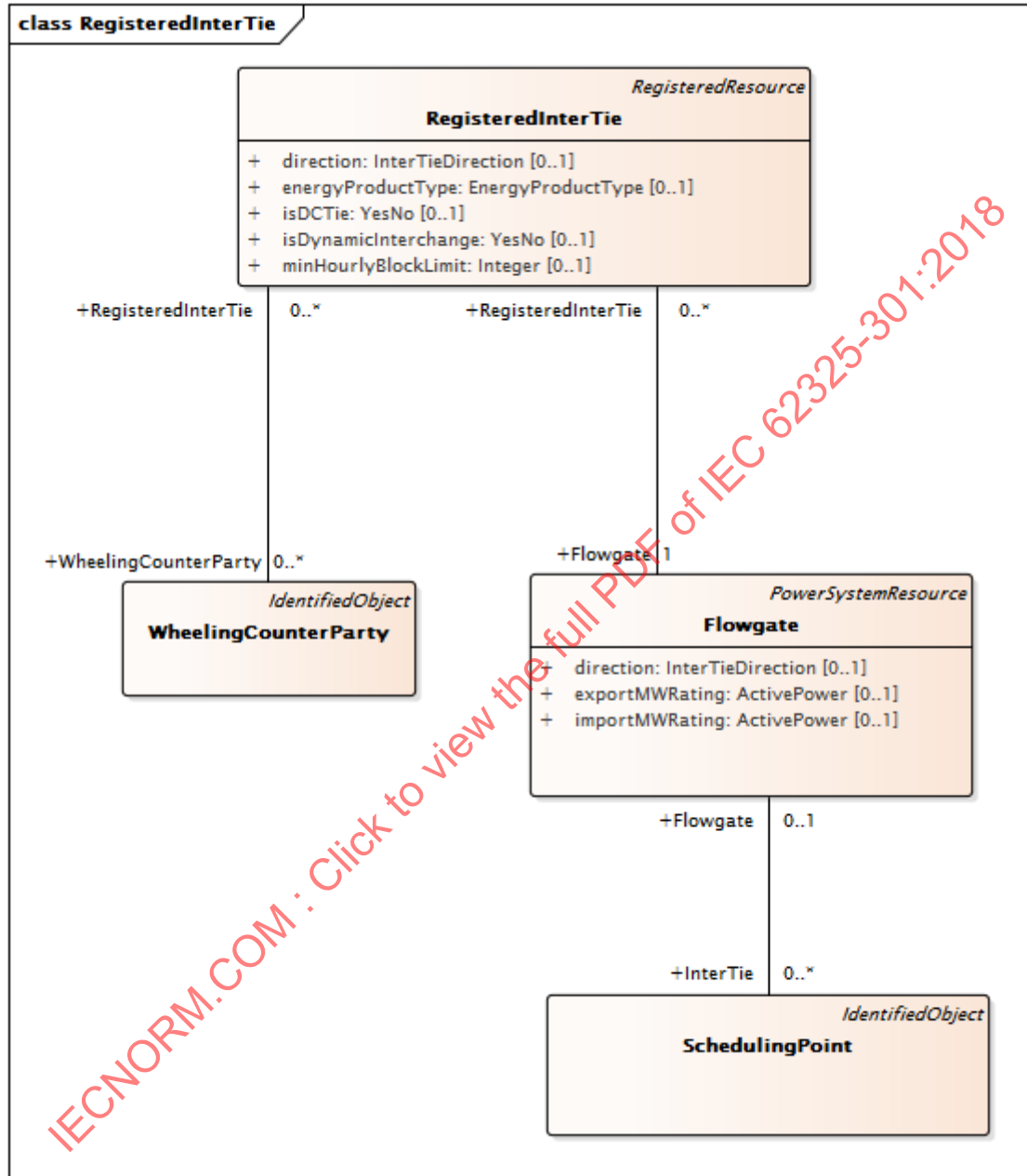


Figure 66 – Class diagram ReferenceData::RegisteredGenerator

Figure 66: Shows the classes and associations use to model registered generators. The RMRStartUpFuelCurve is used to model the cost of starting generating units classified as reliability must run units. Other classes are used to model startup cost, start up energy curve, heat rates, and start up time for RMR units. The class FuelCostCurve is used to model the relationship between startup fuel cost and unit active power output.



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Figure 67 – Class diagram ReferenceData::RegisteredInterTie

Figure 67: Shows the classes and associations used to model registered interties. The SchedulingPoint class is associated with a flowgate which is in turn associated with a RegisteredInterTie. The RegisteredInterTie may be an AC or DC tie to a neighboring utility entity.

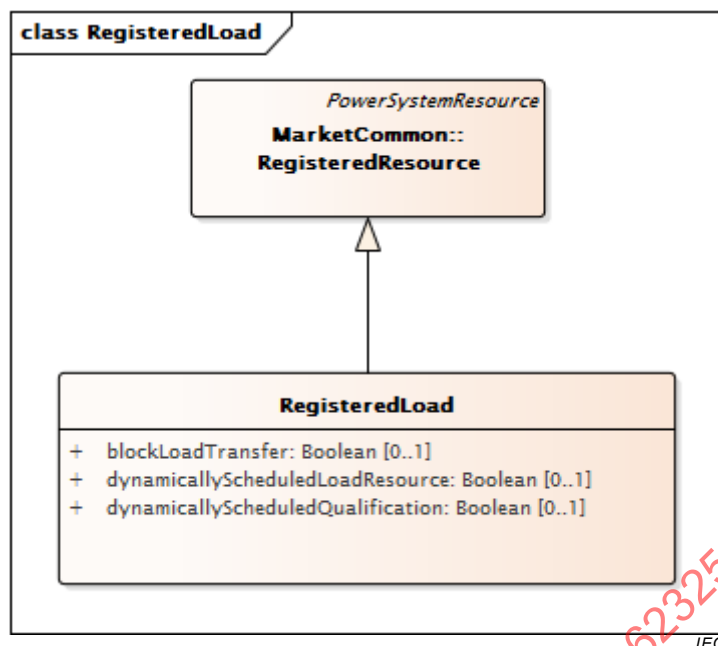


Figure 68 – Class diagram ReferenceData::RegisteredLoad

Figure 68: Shows the classes and associations use to model registered loads. RegisterLoads may participate in the market by offering to reduce baseline consumption of energy and one or more electrical products (energy, ancillary services) in return for a payment. The MktEnergyConsumer class models the location of the load in the network.

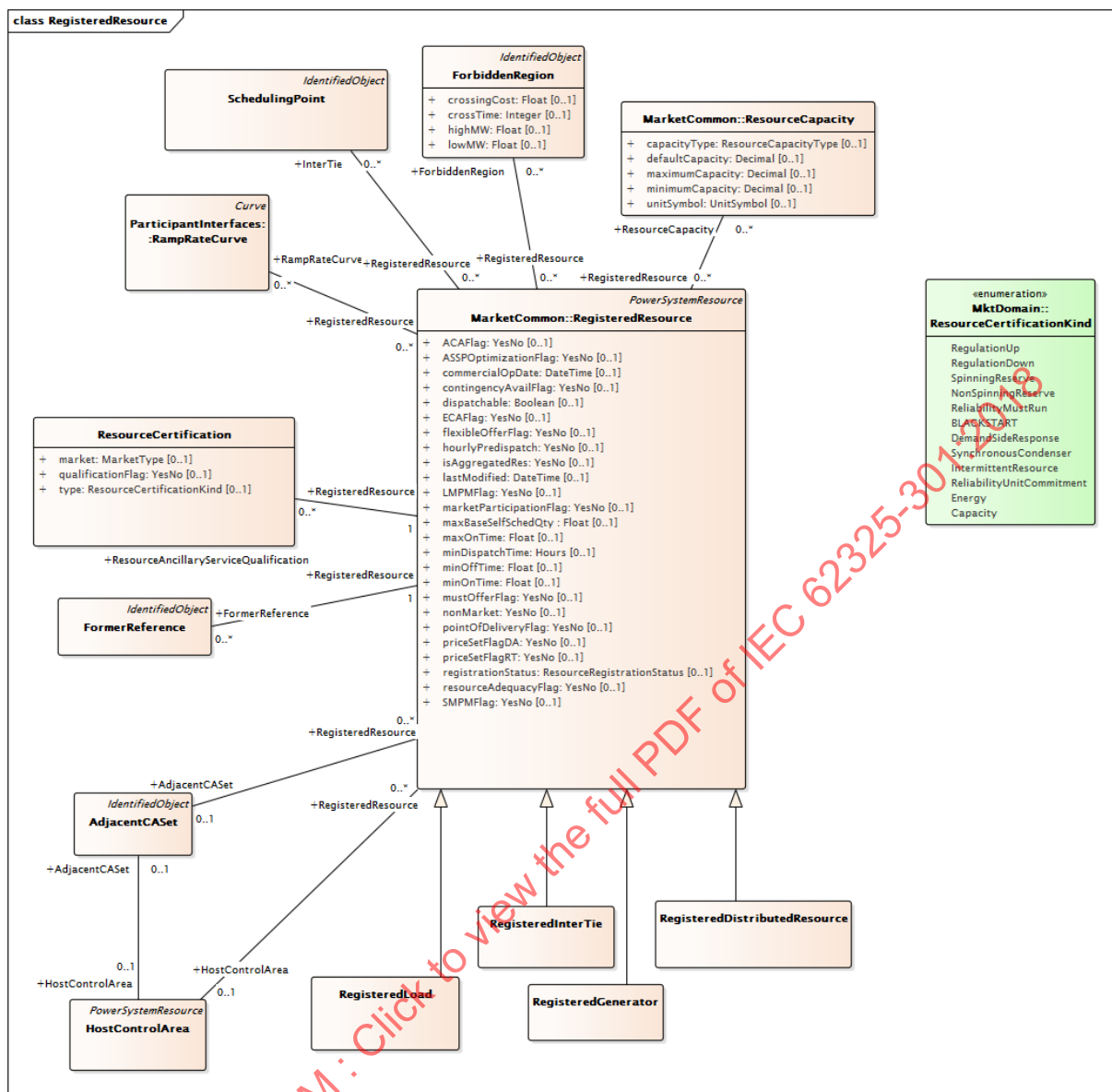


Figure 69 – Class diagram ReferenceData::RegisteredResource

Figure 69: Shows the classes and associations used to model registered resources. The RegisteredResource class is the parent class of the RegisteredGenerator, RegisteredInterTie, and RegisteredLoad subclasses. Major classes include the ResourceAncillaryServiceQualification class that is used to describe the ancillary services that the resource is qualified to offer. The ResourceCapability, the ForbiddenRegion and RampRateCurve classes are used to model technical capabilities of the resource. The SchedulingPoint class models the points on the boundary to other utility entities where the resource can deliver market products to the RTO.

6.5.9.2 AdjacentCaset

Groups Adjacent Control Areas.

Table 505 shows all attributes of AdjacentCaset.

Table 505 – Attributes of ReferenceData::AdjacentCaset

name	mult	type	description
lossPercentage	0..1	Float	Loss percentage
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 506 shows all association ends of AdjacentCaset with other classes.

Table 506 – Association ends of ReferenceData::AdjacentCaset with other classes

mult from	name	mult to	type	description
0..1	BidSelfSched	0..*	BidSelfSched	
0..1	SubControlArea	0..*	SubControlArea	
0..1	RegisteredResource	0..*	RegisteredResource	
0..1	HostControlArea	0..1	HostControlArea	
0..*	RTO	1..1	RTO	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.3 AggregateNode

An aggregated node can define a typed grouping further defined by the AnodeType enumeratuion. Types range from System Zone/Regions to Market Energy Regions to Aggregated Loads and Aggregated Generators.

Table 507 shows all attributes of AggregateNode.

Table 507 – Attributes of ReferenceData::AggregateNode

name	mult	type	description
anodeType	0..1	AnodeType	Type of aggregated node
qualifASOrder	0..1	Integer	Processing Order for AS self-provisions for this region. The priority of this attribute directs the awards of any resource that resides in overlapping regions. The regions are processed in priority manner.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 508 shows all association ends of AggregateNode with other classes.

Table 508 – Association ends of ReferenceData::AggregateNode with other classes

mult from	name	mult to	type	description
0..*	Pnode	0..*	Pnode	
0..1	CnodeDistributionFactor	0..*	CnodeDistributionFactor	
0..*	SubControlArea	0..*	SubControlArea	
0..1	RegisteredResource	0..*	RegisteredResource	A RegisteredResource can be associated to only one AggregateNode if not connected to a Pnode or MktConnectivityNode.
0..1	AreaLoadCurve	0..*	AreaLoadCurve	
0..1	Instruction	0..*	Instructions	
0..*	RTO	1..1	RTO	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.4 AggregatedPnode

An aggregated pricing node is a specialized type of pricing node used to model items such as System Zone, Default Price Zone, Custom Price Zone, Control Area, Aggregated Generation, Aggregated Participating Load, Aggregated Non-Participating Load, Trading Hub, Designated Control Area(DCA) Zone.

Table 509 shows all attributes of AggregatedPnode.

Table 509 – Attributes of ReferenceData::AggregatedPnode

name	mult	type	description
apnodeType	0..1	ApnodeType	Aggregate Price Node Types
participationCategory	0..1	ParticipationCategoryMPM	Designated Control Area participation in LMP price measurement 'Y' – Participates in both Local Market Power Mitigation (LMPM) and System Market Power Mitigation (SMPM) 'N' – Not included in LMP price measures 'S' – Participatesin SMPM price measures 'L' – Participatesin LMPM price measures
isPublic	0..1	Boolean	inherited from: Pnode
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 510 shows all association ends of AggregatedPnode with other classes.

Table 510 – Association ends of ReferenceData::AggregatedPnode with other classes

mult from	name	mult to	type	description
0..1	GenDistributionFactor	1..*	GenDistributionFactor	
0..1	LoadDistributionFactor	1..*	LoadDistributionFactor	
1..1	MPMTestResults	1..*	MPMTestResults	
0..*	TACArea	0..*	TACArea	
1..1	PnodeDistributionFactor	1..*	PnodeDistributionFactor	
1..1	TradingHubValues	0..*	TradingHubValues	
0..1	MktCombinedCyclePlant	0..*	MktCombinedCyclePlant	
0..*	MPMTestThreshold	1..*	MPMTestThreshold	
0..1	RegisteredResources	0..*	RegisteredResource	inherited from: Pnode
0..*	SourceCRRSegment	0..*	CRRSegment	inherited from: Pnode
0..*	SinkCRRSegment	0..*	CRRSegment	inherited from: Pnode
0..1	MktMeasurement	0..*	MktMeasurement	inherited from: Pnode
1..1	ExPostResults	0..*	ExPostPricingResults	inherited from: Pnode
0..1	PnodeResults	1..*	PnodeResults	inherited from: Pnode
0..1	Trade	0..*	Trade	inherited from: Pnode
0..1	ReceiptTransactionBids	0..*	TransactionBid	inherited from: Pnode
0..1	DeliveryTransactionBids	0..*	TransactionBid	inherited from: Pnode
0..*	SubControlArea	0..1	SubControlArea	inherited from: Pnode
1..1	CommodityDefinition	0..*	CommodityDefinition	inherited from: Pnode
0..*	AggregateNode	0..*	AggregateNode	inherited from: Pnode
1..1	OrgPnodeAllocation	0..*	OrgPnodeAllocation	inherited from: Pnode
0..*	RTO	0..1	RTO	inherited from: Pnode
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.5 BidPriceCap root class

This class represent the bid price cap.

Table 511 shows all attributes of BidPriceCap.

Table 511 – Attributes of ReferenceData::BidPriceCap

name	mult	type	description
marketType	0..1	MarketType	Market Type of the cap (DAM or RTM)
bidFloor	0..1	CostPerEnergyUnit	Bid Floor, (\$/MWH)
bidCeiling	0..1	CostPerEnergyUnit	Bid Ceiling (\$/MWH)
defaultPrice	0..1	CostPerEnergyUnit	Bid Default Price(\$/MWH)
bidFloorAS	0..1	CostPerEnergyUnit	Bid Floor (\$/MWH) for generic AS versus a specific market product
bidCeilingAS	0..1	CostPerEnergyUnit	Bid Ceiling (\$/MWH) for generic AS versus a specific market product

Table 512 shows all association ends of BidPriceCap with other classes.

Table 512 – Association ends of ReferenceData::BidPriceCap with other classes

mult from	name	mult to	type	description
0..*	MarketProduct	0..1	MarketProduct	

6.5.9.6 CnodeDistributionFactor

Participation factors per Cnode. Used to calculate "participation" of Cnode in an AggregateNode. Each Cnode associated to an AggregateNode would be assigned a participation factor for its participation within the AggregateNode.

Table 513 shows all attributes of CnodeDistributionFactor.

Table 513 – Attributes of ReferenceData::CnodeDistributionFactor

name	mult	type	description
factor	0..1	Float	Used to calculate "participation" of Cnode in an AggregateNode
podLossFactor	0..1	Float	Point of delivery loss factor
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 514 shows all association ends of CnodeDistributionFactor with other classes.

Table 514 – Association ends of ReferenceData::CnodeDistributionFactor with other classes

mult from	name	mult to	type	description
0..*	MktConnectivityNode	1..1	MktConnectivityNode	
0..*	SubControlArea	0..1	SubControlArea	
0..*	AggregateNode	0..1	AggregateNode	
0..*	HostControlArea	0..1	HostControlArea	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.7 CombinedCycleConfiguration

Configuration options for combined cycle units.

For example, a Combined Cycle with (CT1, CT2, ST1) will have (CT1, ST1) and (CT2, ST1) configurations as part of (1CT + 1ST logical configuration).

Table 515 shows all attributes of CombinedCycleConfiguration.

Table 515 – Attributes of ReferenceData::CombinedCycleConfiguration

name	mult	type	description
primaryConfiguration	0..1	Boolean	Whether this CombinedCycleConfiguration is the primary configuration in the associated Logical configuration?
ShutdownFlag	0..1	Boolean	Whether Combined Cycle Plant can be shut-down in this Configuration?
StartupFlag	0..1	Boolean	Whether Combined Cycle Plant can be started in this Logical Configuration?
capacityFactor	0..1	PerCent	inherited from: RegisteredGenerator
coldStartTime	0..1	Float	inherited from: RegisteredGenerator
combinedCycleOperatingMode	0..1	String	inherited from: RegisteredGenerator
commercialOperationDate	0..1	DateTime	inherited from: RegisteredGenerator
constrainedOutputFlag	0..1	YesNo	inherited from: RegisteredGenerator
energyDownRampRate	0..1	ActivePowerChangeRate	inherited from: RegisteredGenerator
energyUpRampRate	0..1	ActivePowerChangeRate	inherited from: RegisteredGenerator
extremeLongStart	0..1	YesNo	inherited from: RegisteredGenerator
fuelSource	0..1	FuelSource	inherited from: RegisteredGenerator
highControlLimit	0..1	ActivePower	inherited from: RegisteredGenerator
hotIntTime	0..1	Float	inherited from: RegisteredGenerator
hotStartTime	0..1	Float	inherited from: RegisteredGenerator
intColdTime	0..1	Float	inherited from: RegisteredGenerator
intStartTime	0..1	Float	inherited from: RegisteredGenerator
loadFollowingDownMSS	0..1	YesNo	inherited from: RegisteredGenerator
loadFollowingUpMSS	0..1	YesNo	inherited from: RegisteredGenerator
lowControlLimit	0..1	ActivePower	inherited from: RegisteredGenerator
maxDependableCap	0..1	ActivePower	inherited from: RegisteredGenerator
maximumAllowableSpinningReserve	0..1	ActivePower	inherited from: RegisteredGenerator
maximumOperatingLimit	0..1	ActivePower	inherited from: RegisteredGenerator
maxMinLoadCost	0..1	CostRate	inherited from: RegisteredGenerator
maxPumpingLevel	0..1	ActivePower	inherited from: RegisteredGenerator
maxShutdownTime	0..1	DateTime	inherited from: RegisteredGenerator
maxStartUpsPerDay	0..1	Integer	inherited from: RegisteredGenerator
maxWeeklyEnergy	0..1	Float	inherited from: RegisteredGenerator
maxWeeklyStarts	0..1	Integer	inherited from: RegisteredGenerator
minimumLoadCostBasis	0..1	CostBasis	inherited from: RegisteredGenerator
minimumLoadFuelCost	0..1	CostPerHeatUnit	inherited from: RegisteredGenerator
minimumOperatingLimit	0..1	ActivePower	inherited from: RegisteredGenerator
minLoadCost	0..1	CostRate	inherited from: RegisteredGenerator
mustOfferRA	0..1	YesNo	inherited from: RegisteredGenerator
nameplateCapacity	0..1	ActivePower	inherited from: RegisteredGenerator
operatingMaintenanceCost	0..1	CostPerEnergyUnit	inherited from: RegisteredGenerator
pumpingCost	0..1	CostRate	inherited from: RegisteredGenerator
pumpingFactor	0..1	Float	inherited from: RegisteredGenerator

name	mult	type	description
pumpMinDownTime	0..1	Float	inherited from: RegisteredGenerator
pumpMinUpTime	0..1	Float	inherited from: RegisteredGenerator
pumpShutdownCost	0..1	Float	inherited from: RegisteredGenerator
pumpShutdownTime	0..1	Integer	inherited from: RegisteredGenerator
quickStartFlag	0..1	YesNo	inherited from: RegisteredGenerator
rampCurveType	0..1	RampCurveType	inherited from: RegisteredGenerator
regulationDownRampRate	0..1	ActivePowerChangeRate	inherited from: RegisteredGenerator
regulationFlag	0..1	UnitRegulationKind	inherited from: RegisteredGenerator
regulationUpRampRate	0..1	ActivePowerChangeRate	inherited from: RegisteredGenerator
resourceSubType	0..1	String	inherited from: RegisteredGenerator
riverSystem	0..1	String	inherited from: RegisteredGenerator
RMNRFlag	0..1	YesNo	inherited from: RegisteredGenerator
RMRFlag	0..1	FlagTypeRMR	inherited from: RegisteredGenerator
RMRManualIndicator	0..1	YesNo	inherited from: RegisteredGenerator
RMTFlag	0..1	YesNo	inherited from: RegisteredGenerator
spinRampRate	0..1	ActivePowerChangeRate	inherited from: RegisteredGenerator
startUpCostBasis	0..1	CostBasis	inherited from: RegisteredGenerator
syncCondCapable	0..1	YesNo	inherited from: RegisteredGenerator
unitType	0..1	UnitType	inherited from: RegisteredGenerator
useLimitFlag	0..1	YesNo	inherited from: RegisteredGenerator
variableEnergyResource	0..1	YesNo	inherited from: RegisteredGenerator
ACAFlag	0..1	YesNo	inherited from: RegisteredResource
ASSPOptimizationFlag	0..1	YesNo	inherited from: RegisteredResource
commercialOpDate	0..1	DateTime	inherited from: RegisteredResource
contingencyAvailFlag	0..1	YesNo	inherited from: RegisteredResource
dispatchable	0..1	Boolean	inherited from: RegisteredResource
ECAFlag	0..1	YesNo	inherited from: RegisteredResource
flexibleOfferFlag	0..1	YesNo	inherited from: RegisteredResource
hourlyPredispatch	0..1	YesNo	inherited from: RegisteredResource
isAggregatedRes	0..1	YesNo	inherited from: RegisteredResource
lastModified	0..1	DateTime	inherited from: RegisteredResource
LMPMFlag	0..1	YesNo	inherited from: RegisteredResource
marketParticipationFlag	0..1	YesNo	inherited from: RegisteredResource
maxBaseSelfSchedQty	0..1	Float	inherited from: RegisteredResource
maxOnTime	0..1	Float	inherited from: RegisteredResource
minDispatchTime	0..1	Hours	inherited from: RegisteredResource
minOffTime	0..1	Float	inherited from: RegisteredResource
minOnTime	0..1	Float	inherited from: RegisteredResource
mustOfferFlag	0..1	YesNo	inherited from: RegisteredResource
nonMarket	0..1	YesNo	inherited from: RegisteredResource
pointOfDeliveryFlag	0..1	YesNo	inherited from: RegisteredResource
priceSetFlagDA	0..1	YesNo	inherited from: RegisteredResource
priceSetFlagRT	0..1	YesNo	inherited from: RegisteredResource

name	mult	type	description
registrationStatus	0..1	ResourceRegistrationStatus	inherited from: RegisteredResource
resourceAdequacyFlag	0..1	YesNo	inherited from: RegisteredResource
SMPMFlag	0..1	YesNo	inherited from: RegisteredResource
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 516 shows all association ends of CombinedCycleConfiguration with other classes.

**Table 516 – Association ends of ReferenceData::
CombinedCycleConfiguration with other classes**

mult from	name	mult to	type	description
1..1	ToTransitionState	0..*	CombinedCycleTransitionState	
1..1	FromTransitionState	0..*	CombinedCycleTransitionState	
1..1	CombinedCycleConfigurationMember	0..*	CombinedCycleConfigurationMember	
1..*	CombinedCycleLogicalConfiguration	0..1	CombinedCycleLogicalConfiguration	
0..1	GeneratingBids	0..*	GeneratingBid	inherited from: RegisteredGenerator
0..1	StartupTimeCurve	0..1	StartupTimeCurve	inherited from: RegisteredGenerator
0..1	Trade	0..*	Trade	inherited from: RegisteredGenerator
0..1	MktHeatRateCurve	0..1	MktHeatRateCurve	inherited from: RegisteredGenerator
0..1	RMRHeatRateCurve	0..1	RMRHeatRateCurve	inherited from: RegisteredGenerator
0..1	RMRStartupCostCurve	0..1	RMRStartupCostCurve	inherited from: RegisteredGenerator
0..1	RMRStartupEnergyCurve	0..1	RMRStartupEnergyCurve	inherited from: RegisteredGenerator
0..1	RMRStartupFuelCurve	0..1	RMRStartupFuelCurve	inherited from: RegisteredGenerator
0..1	RMRStartupTimeCurve	0..1	RMRStartupTimeCurve	inherited from: RegisteredGenerator
0..1	RegulatingLimit	0..1	RegulatingLimit	inherited from: RegisteredGenerator
0..1	StartupFuelCurve	0..1	StartupFuelCurve	inherited from: RegisteredGenerator
0..1	StartupEnergyCurve	0..1	StartupEnergyCurve	inherited from: RegisteredGenerator
0..1	AuxiliaryObject	0..*	AuxiliaryObject	inherited from: RegisteredGenerator
1..1	EnergyPriceIndex	1..1	EnergyPriceIndex	inherited from: RegisteredGenerator
0..1	UnitInitialConditions	0..*	UnitInitialConditions	inherited from: RegisteredGenerator
0..*	StartupCostCurves	0..*	StartupCostCurve	inherited from: RegisteredGenerator
0..1	FuelCostCurve	0..1	FuelCostCurve	inherited from: RegisteredGenerator
0..*	FuelRegion	0..1	FuelRegion	inherited from: RegisteredGenerator
0..*	LocalReliabilityArea	0..1	LocalReliabilityArea	inherited from: RegisteredGenerator
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: RegisteredResource
0..*	ForbiddenRegion	0..*	ForbiddenRegion	inherited from: RegisteredResource
0..*	AggregateNode	0..1	AggregateNode	inherited from: RegisteredResource
1..1	DispatchInstReply	0..*	DispatchInstReply	inherited from: RegisteredResource

mult from	name	mult to	type	description
0..*	TimeSeries	0..*	TimeSeries	inherited from: RegisteredResource
0..*	RampRateCurve	0..*	RampRateCurve	inherited from: RegisteredResource
0..1	ContractDistributionFactor	0..*	ContractDistributionFactor	inherited from: RegisteredResource
1..1	OrgResOwnership	0..*	OrgResOwnership	inherited from: RegisteredResource
0..1	RMROperatorInput	0..*	RMROperatorInput	inherited from: RegisteredResource
0..1	ResourceDispatchResults	0..*	ResourceDispatchResults	inherited from: RegisteredResource
0..1	SubstitutionResourceList	0..*	SubstitutionResourceList	inherited from: RegisteredResource
0..*	AdjacentCASet	0..1	AdjacentCASet	inherited from: RegisteredResource
0..*	SubControlArea	0..*	SubControlArea	inherited from: RegisteredResource
1..1	IntermittentResourceEligibility	0..*	IntermittentResourceEligibility	inherited from: RegisteredResource
1..1	FormerReference	0..*	FormerReference	inherited from: RegisteredResource
1..1	Commitments	0..*	Commitments	inherited from: RegisteredResource
0..1	MPMResourceStatus	0..*	MPMResourceStatus	inherited from: RegisteredResource
0..1	RUCAwardInstruction	0..*	RUCAwardInstruction	inherited from: RegisteredResource
0..1	AllocationResultValues	0..*	AllocationResultValues	inherited from: RegisteredResource
1..1	LoadFollowingInst	0..*	LoadFollowingInst	inherited from: RegisteredResource
0..1	ResourceLoadFollowingInst	0..*	ResourceLoadFollowingInst	inherited from: RegisteredResource
1..1	ResourceAncillaryServiceQualification	0..*	ResourceCertification	inherited from: RegisteredResource
0..1	ExpectedEnergyValues	0..*	ExpectedEnergyValues	inherited from: RegisteredResource
0..*	Reason	0..*	Reason	inherited from: RegisteredResource
0..*	InterTie	0..*	SchedulingPoint	inherited from: RegisteredResource
0..*	MktConnectivityNode	0..1	MktConnectivityNode	inherited from: RegisteredResource
0..1	DopInstruction	0..*	DopInstruction	inherited from: RegisteredResource
0..*	ResourceCapacity	0..*	ResourceCapacity	inherited from: RegisteredResource
1..1	ResourceVerifiableCosts	0..1	ResourceVerifiableCosts	inherited from: RegisteredResource
1..1	DefaultBid	0..1	DefaultBid	inherited from: RegisteredResource
0..*	MarketObjectStatus	0..*	MarketObjectStatus	inherited from: RegisteredResource
0..*	ControlAreaDesignation	0..*	ControlAreaDesignation	inherited from: RegisteredResource
0..1	LoadFollowingOperatorInput	0..*	LoadFollowingOperatorInput	inherited from: RegisteredResource
0..*	MPMTestThreshold	0..*	MPMTestThreshold	inherited from: RegisteredResource
0..1	ResourceAwardInstruction	0..*	ResourceAwardInstruction	inherited from: RegisteredResource
0..1	ExPostResourceResults	0..*	ExPostResourceResults	inherited from: RegisteredResource
1..1	Instructions	0..*	Instructions	inherited from: RegisteredResource
0..*	Pnode	0..1	Pnode	inherited from: RegisteredResource
0..*	HostControlArea	0..1	HostControlArea	inherited from: RegisteredResource
0..*	Domain	0..*	Domain	inherited from: RegisteredResource
0..*	EnergyMarkets	0..*	EnergyMarket	inherited from: RegisteredResource
0..1	DotInstruction	0..*	DotInstruction	inherited from: RegisteredResource
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource

mult from	name	mult to	type	description
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.8 CombinedCycleConfigurationMember

Configuration Member of CCP Configuration.

Table 517 shows all attributes of CombinedCycleConfigurationMember.

Table 517 – Attributes of ReferenceData::CombinedCycleConfigurationMember

name	mult	type	description
primary	0..1	Boolean	primary configuration.
steam	0..1	Boolean	Steam plant.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 518 shows all association ends of CombinedCycleConfigurationMember with other classes.

Table 518 – Association ends of ReferenceData::CombinedCycleConfigurationMember with other classes

mult from	name	mult to	type	description
0..*	MktThermalGeneratingUnit	1..1	MktThermalGeneratingUnit	
0..*	CombinedCycleConfiguration	1..1	CombinedCycleConfiguration	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.9 CombinedCycleLogicalConfiguration

Logical Configuration of a Combined Cycle plant.

Operating Combined Cycle Plant (CCP) configurations are represented as Logical CCP Resources. Logical representation shall be used for Market applications to optimize and control Market Operations. Logical representation is also necessary for controlling the number of CCP configurations and to temper performance issues that may otherwise occur.

For example, (2CT configuration), (1CT + 1ST configuration) are examples of logical configuration, without specifying the specific CT and ST participating in the configuration.

Table 519 shows all attributes of CombinedCycleLogicalConfiguration.

Table 519 – Attributes of ReferenceData::CombinedCycleLogicalConfiguration

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 520 shows all association ends of CombinedCycleLogicalConfiguration with other classes.

Table 520 – Association ends of ReferenceData::CombinedCycleLogicalConfiguration with other classes

mult from	name	mult to	type	description
0..1	CombinedCycleConfiguration	1..*	CombinedCycleConfiguration	
1..*	MktCombinedCyclePlant	0..1	MktCombinedCyclePlant	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.10 CombinedCycleTransitionState root class

Defines the available from and to Transition States for the Combine Cycle Configurations.

Table 521 shows all attributes of CombinedCycleTransitionState.

Table 521 – Attributes of ReferenceData::CombinedCycleTransitionState

name	mult	type	description
upTransition	0..1	Boolean	Flag indicating whether this is an UP transition. If not, it is a DOWN transition.

Table 522 shows all association ends of CombinedCycleTransitionState with other classes.

Table 522 – Association ends of ReferenceData::CombinedCycleTransitionState with other classes

mult from	name	mult to	type	description
0..*	ToConfiguration	1..1	CombinedCycleConfiguration	
0..*	FromConfiguration	1..1	CombinedCycleConfiguration	

6.5.9.11 CongestionArea

Designated Congestion Area Definition (DCA).

Table 523 shows all attributes of CongestionArea.

Table 523 – Attributes of ReferenceData::CongestionArea

name	mult	type	description
apnodeType	0..1	ApnodeType	inherited from: AggregatedPnode
participationCategory	0..1	ParticipationCategoryMPM	inherited from: AggregatedPnode
isPublic	0..1	Boolean	inherited from: Pnode
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 524 shows all association ends of CongestionArea with other classes.

Table 524 – Association ends of ReferenceData::CongestionArea with other classes

mult from	name	mult to	type	description
0..*	IndividualPnode	0..*	IndividualPnode	
0..1	GenDistributionFactor	1..*	GenDistributionFactor	inherited from: AggregatedPnode
0..1	LoadDistributionFactor	1..*	LoadDistributionFactor	inherited from: AggregatedPnode
1..1	MPMTestResults	1..*	MPMTestResults	inherited from: AggregatedPnode
0..*	TACArea	0..*	TACArea	inherited from: AggregatedPnode
1..1	PnodeDistributionFactor	1..*	PnodeDistributionFactor	inherited from: AggregatedPnode
1..1	TradingHubValues	0..*	TradingHubValues	inherited from: AggregatedPnode
0..1	MktCombinedCyclePlant	0..*	MktCombinedCyclePlant	inherited from: AggregatedPnode
0..*	MPMTestThreshold	1..*	MPMTestThreshold	inherited from: AggregatedPnode
0..1	RegisteredResources	0..*	RegisteredResource	inherited from: Pnode
0..*	SourceCRRSegment	0..*	CRRSegment	inherited from: Pnode
0..*	SinkCRRSegment	0..*	CRRSegment	inherited from: Pnode
0..1	MktMeasurement	0..*	MktMeasurement	inherited from: Pnode
1..1	ExPostResults	0..*	ExPostPricingResults	inherited from: Pnode
0..1	PnodeResults	1..*	PnodeResults	inherited from: Pnode
0..1	Trade	0..*	Trade	inherited from: Pnode

mult from	name	mult to	type	description
0..1	ReceiptTransactionBids	0..*	TransactionBid	inherited from: Pnode
0..1	DeliveryTransactionBids	0..*	TransactionBid	inherited from: Pnode
0..*	SubControlArea	0..1	SubControlArea	inherited from: Pnode
1..1	CommodityDefinition	0..*	CommodityDefinition	inherited from: Pnode
0..*	AggregateNode	0..*	AggregateNode	inherited from: Pnode
1..1	OrgPnodeAllocation	0..*	OrgPnodeAllocation	inherited from: Pnode
0..*	RTO	0..1	RTO	inherited from: Pnode
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.12 ContractDistributionFactor root class

Distribution among resources at the sink point or source point.

Table 525 shows all attributes of ContractDistributionFactor.

Table 525 – Attributes of ReferenceData::ContractDistributionFactor

name	mult	type	description
factor	0..1	Float	MW value that this resource provides to the overall contract.
sourceFlag	0..1	YesNo	This value will be set to YES if the referenced Cnode is defined as the source point in the contract.
sinkFlag	0..1	YesNo	This value will be set to YES if the referenced Cnode is defined as the sink point in the contract.

Table 526 shows all association ends of ContractDistributionFactor with other classes.

Table 526 – Association ends of ReferenceData::ContractDistributionFactor with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
0..*	TransmissionContractRight	0..1	ContractRight	
0..*	Flowgate	0..1	Flowgate	

6.5.9.13 ContractRight

Provides definition of Transmission Ownership Right and Existing Transmission Contract identifiers for use by SCUC. RMR contract hosting: Startup lead time, Contract Service Limits, Max Service Hours, Max MWs, Max Start-ups, Ramp Rate, Max Net Dependable Capacity, Min Capacity and Unit Substitution for DAM/RTM to retrieve.

Table 527 shows all attributes of ContractRight.

Table 527 – Attributes of ReferenceData::ContractRight

name	mult	type	description
chainOrder	0..1	Integer	When used in conjunction with a Transmission Right contract chain, this is the precedence for the contracts.
contractMW	0..1	Float	MW value of the contract
contractPrice	0..1	CostPerEnergyUnit	Financial value of the contract
contractPriority	0..1	Integer	Priority for the contract. This should be unique among all contracts for a specific resource. This value is the directive for the SCUC algorithm on the order to satisfy/cut contracts.
contractStatus	0..1	String	Contract status
contractType	0..1	ContractType	type of the contract. Possible values are but not limited by: ETC, TOR or RMR and RMT self schedules
financialLocation	0..1	YesNo	Indicator if the location associated with this contract is financial (e.g. pricing nodes) or physical (e.g. connectivity nodes).
financialRightsDAM	0..1	YesNo	Flag to indicate this contract provides financial rights in the DA Market
financialRightsRTM	0..1	YesNo	Flag to indicate this contract provides financial rights in the RT Market
fuelAdder	0..1	Float	Estimated Fuel Adder
latestSchedMinutes	0..1	Integer	This indicates the latest schedule minutes (e.g. t – xx) that this resource can be notified to respond. This attribute is only used if the market type is not supplied.
latestSchedMktType	0..1	MarketType	This indicates the latest schedule market type a contract can be applied to. This is used in conjunction with the latestSchedMinutes attribute to determine the latest time this contract can be called in. The possible values for this attribute are: DAM, RTM or it can be omitted. If omitted, the latestSchedMinutes attribute defines the value.
maximumScheduleQuantity	0..1	Float	Maximum schedule MW quantity
maximumServiceHours	0..1	Integer	Maximum service hours
maximumStartups	0..1	Integer	Maximum startups
maxNetDependableCapacity	0..1	Float	Maximum Net Dependable Capacity
minimumLoad	0..1	Float	Minimum Load
minimumScheduleQuantity	0..1	Float	Minimum schedule quantity
physicalRightsDAM	0..1	YesNo	Flag to indicate this contract provides physical rights in the DA Market
physicalRightsRTM	0..1	YesNo	Flag to indicate this contract provides physical rights in the RT Market
startupLeadTime	0..1	Integer	Start up lead time
TRType	0..1	TRType	Transmission Right type – is this an individual contract right or a chain contract right. Types = CHAIN or INDIVIDUAL
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 528 shows all association ends of ContractRight with other classes.

Table 528 – Association ends of ReferenceData::ContractRight with other classes

mult from	name	mult to	type	description
1..1	TREntitlement	0..*	TREntitlement	
0..1	BidSelfSched	0..*	BidSelfSched	
0..1	ContractDistributionFactor	0..*	ContractDistributionFactor	
0..1	SubstitutionResourceList	0..*	SubstitutionResourceList	
1..1	TransmissionInterfaceEntitlement	0..*	TransmissionInterfaceRightEntitlement	
1..*	Ind_TransmissionRightChain	0..1	TransmissionRightChain	
1..1	Chain_TransmissionRightChain	0..1	TransmissionRightChain	
0..*	SchedulingCoordinator	1..1	SchedulingCoordinator	
0..*	RTO	1..1	RTO	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.14 ControlAreaDesignation root class

Indicates Control Area associated with self-schedule.

Table 529 shows all attributes of ControlAreaDesignation.

Table 529 – Attributes of ReferenceData::ControlAreaDesignation

name	mult	type	description
attained	0..1	YesNo	Attained.
native	0..1	YesNo	Native.

Table 530 shows all association ends of ControlAreaDesignation with other classes.

Table 530 – Association ends of ReferenceData::ControlAreaDesignation with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..*	RegisteredResource	
0..*	SubControlArea	0..*	SubControlArea	

6.5.9.15 Flowgate

A flowgate, is single or group of transmission elements intended to model MW flow impact relating to transmission limitations and transmission service usage.

Table 531 shows all attributes of Flowgate.

Table 531 – Attributes of ReferenceData::Flowgate

name	mult	type	description
direction	0..1	InterTieDirection	The direction of the flowgate, export or import
exportMWRating	0..1	ActivePower	Export MW rating
importMWRating	0..1	ActivePower	Import MW rating
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 532 shows all association ends of Flowgate with other classes.

Table 532 – Association ends of ReferenceData::Flowgate with other classes

mult from	name	mult to	type	description
0..*	MktLine	0..*	MktLine	
0..*	MktPowerTransformer	0..*	MktPowerTransformer	
0..1	SecurityConstraints	0..1	SecurityConstraints	
0..1	TransmissionCapacity	0..*	TransmissionCapacity	
0..1	TransmissionRightEntitlement	0..*	TransmissionInterfaceRightEntitlement	
1..1	ConstraintResults	1..*	ConstraintResults	
0..1	ContractDistributionFactor	0..*	ContractDistributionFactor	
1..1	FlowgateRelief	0..*	FlowgateRelief	
0..1	InterTie	0..*	SchedulingPoint	
1..1	RegisteredInterTie	0..*	RegisteredInterTie	
0..*	To_SubControlArea	0..1	SubControlArea	
0..*	From_SubControlArea	0..1	SubControlArea	
1..1	FlowgateValue	0..*	FlowgateValue	
0..1	CongestionRevenueRight	0..1	CongestionRevenueRight	
0..1	MktTerminal	0..*	MktTerminal	

mult from	name	mult to	type	description
0..1	GeneratingUnitDynamicValues	0..*	GeneratingUnitDynamicValues	
0..*	GenericConstraints	0..1	GenericConstraints	
0..*	HostControlArea	0..1	HostControlArea	
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.16 FlowgatePartner

Flowgate defined partner.

Table 533 shows all attributes of FlowgatePartner.

Table 533 – Attributes of ReferenceData::FlowgatePartner

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 534 shows all association ends of FlowgatePartner with other classes.

Table 534 – Association ends of ReferenceData::FlowgatePartner with other classes

mult from	name	mult to	type	description
0..1	FlowgateValue	0..1	FlowgateValue	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.17 FlowgateRelief root class

IDC (Interchange Distribution Calculator) sends data for a TLR (Transmission Loading Relief).

Table 535 shows all attributes of FlowgateRelief.

Table 535 – Attributes of ReferenceData::FlowgateRelief

name	mult	type	description
effectiveDate	0..1	DateTime	Date/Time when record becomes effective Used to determine when a record becomes effective.
terminateDate	0..1	DateTime	Date/Time when record is no longer effective Used to determine when a record is no longer effective
idcTargetMktFlow	0..1	Integer	Energy Flow level that should be maintained according to the TLR rules as specified by the IDC. For Realtime Markets use in dispatch to control constraints under TLR and calculate unconstrained market flows

Table 536 shows all association ends of FlowgateRelief with other classes.

Table 536 – Association ends of ReferenceData::FlowgateRelief with other classes

mult from	name	mult to	type	description
0..*	Flowgate	1..1	Flowgate	

6.5.9.18 FlowgateValue root class

Day Ahead, Network Native Load, Economic Dispatch, values used for calculation of Network Native Load (NNL) Determinator process

Table 537 shows all attributes of FlowgateValue.

Table 537 – Attributes of ReferenceData::FlowgateValue

name	mult	type	description
economicDispatchLimit	0..1	Integer	Limit for Economic Dispatch priority 6 energy flow on the specified flowgate for the specified time period.
effectiveDate	0..1	DateTime	Date/Time when record becomes effective Used to determine when a record becomes effective
firmNetworkLimit	0..1	Integer	Limit for firm flow on the specified flowgate for the specified time period. The amount of energy flow over a specified flowgate due to generation in the market which can be classified as Firm Network priority.
flowDirectionFlag	0..1	FlowDirectionType	Specifies the direction of energy flow in the flowgate
mktFlow	0..1	Integer	The amount of energy flow over a specified flowgate due to generation in the market.
netFirmNetworkLimit	0..1	Integer	Net Energy flow in flowgate for the associated FlowgatePartner

Table 538 shows all association ends of FlowgateValue with other classes.

Table 538 – Association ends of ReferenceData::FlowgateValue with other classes

mult from	name	mult to	type	description
0..*	Flowgate	1..1	Flowgate	
0..1	FlowgatePartner	0..1	FlowgatePartner	

6.5.9.19 ForbiddenRegion

Forbidden region is operating ranges where the units are unable to maintain steady operation without causing equipment damage. The four attributes that define a forbidden region are the low MW, the High MW, the crossing time, and the crossing cost.

Table 539 shows all attributes of ForbiddenRegion.

Table 539 – Attributes of ReferenceData::ForbiddenRegion

name	mult	type	description
crossingCost	0..1	Float	Cost associated with crossing the forbidden region
crossTime	0..1	Integer	Time to cross the forbidden region in minutes.
highMW	0..1	Float	High end of the region definition
lowMW	0..1	Float	Low end of the region definition.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 540 shows all association ends of ForbiddenRegion with other classes.

Table 540 – Association ends of ReferenceData::ForbiddenRegion with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..*	RegisteredResource	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.20 FormerReference

Used to indicate former references to the same piece of equipment. The ID, name, and effectivity dates are utilized.

Table 541 shows all attributes of FormerReference.

Table 541 – Attributes of ReferenceData::FormerReference

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 542 shows all association ends of FormerReference with other classes.

Table 542 – Association ends of ReferenceData::FormerReference with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	1..1	RegisteredResource	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.21 FuelCostCurve

Relationship between unit fuel cost in \$/kWh(Y-axis) and unit output in MW (X-axis).

Table 543 shows all attributes of FuelCostCurve.

Table 543 – Attributes of ReferenceData::FuelCostCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 544 shows all association ends of FuelCostCurve with other classes.

Table 544 – Association ends of ReferenceData::FuelCostCurve with other classes

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..1	RegisteredGenerator	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.22 FuelRegion

Indication of region for fuel inventory purposes.

Table 545 shows all attributes of FuelRegion.

Table 545 – Attributes of ReferenceData::FuelRegion

name	mult	type	description
fuelRegionType	0..1	String	The type of fuel region
lastModified	0..1	DateTime	Time of last update
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 546 shows all association ends of FuelRegion with other classes.

Table 546 – Association ends of ReferenceData::FuelRegion with other classes

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..*	RegisteredGenerator	
1..1	GasPrice	1..1	GasPrice	
1..1	OilPrice	1..1	OilPrice	
0..*	RTO	1..1	RTO	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.23 GasPrice root class

Price of gas in monetary units.

Table 547 shows all attributes of GasPrice.

Table 547 – Attributes of ReferenceData::GasPrice

name	mult	type	description
gasPriceIndex	0..1	Float	The average natural gas price at a defined fuel region.

Table 548 shows all association ends of GasPrice with other classes.

Table 548 – Association ends of ReferenceData::GasPrice with other classes

mult from	name	mult to	type	description
1..1	FuelRegion	1..1	FuelRegion	

6.5.9.24 HostControlArea

A HostControlArea has a set of tie points and a set of generator controls (i.e., AGC). It also has a total load, including transmission and distribution losses.

Table 549 shows all attributes of HostControlArea.

Table 549 – Attributes of ReferenceData::HostControlArea

name	mult	type	description
areaControlMode	0..1	AreaControlMode	The area's present control mode: (CF = constant frequency) or (CTL = constant tie-line) or (TLB = tie-line bias) or (OFF = off control)
freqSetPoint	0..1	Frequency	The present power system frequency set point for automatic generation control
frequencyBiasFactor	0..1	Float	The control area's frequency bias factor, in MW/0.1 Hz, for automatic generation control (AGC)
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 550 shows all association ends of HostControlArea with other classes.

Table 550 – Association ends of ReferenceData::HostControlArea with other classes

mult from	name	mult to	type	description
0..1	RegisteredResource	0..*	RegisteredResource	
1..1	SysLoadDistribuFactor	0..*	SysLoadDistributionFact or	
0..1	TransferInterface	0..*	TransferInterface	
0..1	LossClearingResults	0..*	LossClearingResults	
0..1	BidSelfSched	0..*	BidSelfSched	
0..1	AdjacentCaset	0..1	AdjacentCaset	
0..1	CnodeDistributionFactor	0..*	CnodeDistributionFactor	
0..1	Flowgate	0..*	Flowgate	

mult from	name	mult to	type	description
1..1	SubControlAreas	0..*	SubControlArea	The interchange area may operate as a control area
0..*	RTO	1..1	RTO	
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.25 IndividualPnode

Individual pricing node based on Pnode.

Table 551 shows all attributes of IndividualPnode.

Table 551 – Attributes of ReferenceData::IndividualPnode

name	mult	type	description
isPublic	0..1	Boolean	inherited from: Pnode
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 552 shows all association ends of IndividualPnode with other classes.

Table 552 – Association ends of ReferenceData::IndividualPnode with other classes

mult from	name	mult to	type	description
0..1	MktConnectivityNode	1..1	MktConnectivityNode	
0..1	GenDistributionFactor	0..1	GenDistributionFactor	
0..1	LoadDistributionFactor	0..1	LoadDistributionFactor	
1..1	PnodeDistributionFactor	0..*	PnodeDistributionFactor	
0..*	CongestionArea	0..*	CongestionArea	
0..1	RegisteredResources	0..*	RegisteredResource	inherited from: Pnode
0..*	SourceCRRSegment	0..*	CRRSegment	inherited from: Pnode
0..*	SinkCRRSegment	0..*	CRRSegment	inherited from: Pnode
0..1	MktMeasurement	0..*	MktMeasurement	inherited from: Pnode
1..1	ExPostResults	0..*	ExPostPricingResults	inherited from: Pnode
0..1	PnodeResults	1..*	PnodeResults	inherited from: Pnode

mult from	name	mult to	type	description
0..1	Trade	0..*	Trade	inherited from: Pnode
0..1	ReceiptTransactionBids	0..*	TransactionBid	inherited from: Pnode
0..1	DeliveryTransactionBids	0..*	TransactionBid	inherited from: Pnode
0..*	SubControlArea	0..1	SubControlArea	inherited from: Pnode
1..1	CommodityDefinition	0..*	CommodityDefinition	inherited from: Pnode
0..*	AggregateNode	0..*	AggregateNode	inherited from: Pnode
1..1	OrgPnodeAllocation	0..*	OrgPnodeAllocation	inherited from: Pnode
0..*	RTO	0..1	RTO	inherited from: Pnode
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.26 LoadAggregationPoint

A specialized class of type AggregatedNode type. Defines Load Aggregation Points.

Table 553 shows all attributes of LoadAggregationPoint.

Table 553 – Attributes of ReferenceData::LoadAggregationPoint

name	mult	type	description
anodeType	0..1	AnodeType	inherited from: AggregateNode
qualifASOrder	0..1	Integer	inherited from: AggregateNode
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 554 shows all association ends of LoadAggregationPoint with other classes.

Table 554 – Association ends of ReferenceData::LoadAggregationPoint with other classes

mult from	name	mult to	type	description
0..*	Pnode	0..*	Pnode	inherited from: AggregateNode
0..1	CnodeDistributionFactor	0..*	CnodeDistributionFactor	inherited from: AggregateNode
0..*	SubControlArea	0..*	SubControlArea	inherited from: AggregateNode
0..1	RegisteredResource	0..*	RegisteredResource	inherited from: AggregateNode
0..1	AreaLoadCurve	0..*	AreaLoadCurve	inherited from: AggregateNode
0..1	Instruction	0..*	Instructions	inherited from: AggregateNode
0..*	RTO	1..1	RTO	inherited from: AggregateNode
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

mult from	name	mult to	type	description
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.27 LoadRatio root class

Representing the ratio of the load share for the associated SC.

Table 555 shows all attributes of LoadRatio.

Table 555 – Attributes of ReferenceData::LoadRatio

name	mult	type	description
intervalStartTime	0..1	DateTime	Interval Start Time
intervalEndTime	0..1	DateTime	Interval End Time
share	0..1	PerCent	Share in percentage of total Market load for the selected time interval.

Table 556 shows all association ends of LoadRatio with other classes.

Table 556 – Association ends of ReferenceData::LoadRatio with other classes

mult from	name	mult to	type	description
1..1	SchedulingCoordinator	0..1	SchedulingCoordinator	

6.5.9.28 LocalReliabilityArea

Allows definition of reliability areas (e.g.. load pockets) within the ISO/RTO.

Table 557 shows all attributes of LocalReliabilityArea.

Table 557 – Attributes of ReferenceData::LocalReliabilityArea

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 558 shows all association ends of LocalReliabilityArea with other classes.

Table 558 – Association ends of ReferenceData::LocalReliabilityArea with other classes

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..*	RegisteredGenerator	
0..*	RTO	1..1	RTO	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.29 MPMTTestCategory

Provides a reference to the Market Power Mitigation test identifiers and methods for the results of the DA or RT markets. Specific data is the test identifier (Price, Conduct, or Impact) and the test method (System MPM, Local MPM, Alternate System MPM, or Alternate Local MPM).

Table 559 shows all attributes of MPMTTestCategory.

Table 559 – Attributes of ReferenceData::MPMTTestCategory

name	mult	type	description
testIdentifier	0..1	MPMTTestIdentifierType	1 – Global Price Test 2 – Global Conduct Test 3 – Global Impact Test 4 – Local Price Test 5 – Local Conduct Test 6 – Local Impact Test
testMethod	0..1	MPMTTestMethodType	The method of performing the market power monitoring. Examples are Normal (default) thresholds or Alternate thresholds.
purposeFlag	0..1	PurposeFlagType	Nature of threshold data: 'M' – Mitigation threshold 'R' – Reporting threshold
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 560 shows all association ends of MPMTTestCategory with other classes.

Table 560 – Association ends of ReferenceData::MPMTestCategory with other classes

mult from	name	mult to	type	description
1..1	MPMResourceStatus	0..*	MPMResourceStatus	
1..1	MPMTestResults	0..*	MPMTestResults	
1..1	MPMTestThreshold	0..*	MPMTestThreshold	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.30 MPMTestThreshold root class

Market Power Mitigation (MPM) test thresholds for resource as well as designated congestion areas (DCAs).

Table 561 shows all attributes of MPMTestThreshold.

Table 561 – Attributes of ReferenceData::MPMTestThreshold

name	mult	type	description
price	0..1	CostPerEnergyUnit	Price Threshold in \$/MW
percent	0..1	PerCent	Price Threshold in %
marketType	0..1	MarketType	Market Type (DAM, RTM)

Table 562 shows all association ends of MPMTestThreshold with other classes.

Table 562 – Association ends of ReferenceData::MPMTestThreshold with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..*	RegisteredResource	
1..*	AggregatedPnode	0..*	AggregatedPnode	
0..*	MPMTestCategory	1..1	MPMTestCategory	

6.5.9.31 MSSAggregation

Metered Sub-System aggregation of MSS Zones.

Table 563 shows all attributes of MSSAggregation.

Table 563 – Attributes of ReferenceData::MSSAggregation

name	mult	type	description
costRecovery	0..1	YesNo	Charge for Emission Costs, Start Up Costs, or Minimum Load Costs.
grossSettlement	0..1	YesNo	MSS Load Following may select Net vs. Gross settlement. Net Settlement requires the net Demand settled at the MSS LAP and Net Supply needs to settle at the equivalent to the weighted average price of the MSS generation. Gross load will be settled at the System LAP and the Gross supply will be settled at the LMP. MSS Aggregation that elects gross settlement shall have to identify if its resources are Load Following or not.
ignoreLosses	0..1	YesNo	Provides an indication if losses are to be ignored for this zone. Also referred to as Exclude Marginal Losses.
ignoreMarginalLosses	0..1	YesNo	Provides an indication if marginal losses are to be ignored for this zone.
loadFollowing	0..1	YesNo	Indication that this particular MSSA participates in the Load Following function.
rucProcurement	0..1	YesNo	Indicates that RUC will be procured by the ISO or self provided.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 564 shows all association ends of MSSAggregation with other classes.

Table 564 – Association ends of ReferenceData::MSSAggregation with other classes

mult from	name	mult to	type	description
0..1	MeteredSubSystem	1..*	MeteredSubSystem	
0..*	RTO	1..1	RTO	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.32 MSSZone

Model to define a zone within a Metered Sub System.

Table 565 shows all attributes of MSSZone.

Table 565 – Attributes of ReferenceData::MSSZone

name	mult	type	description
ignoreLosses	0..1	YesNo	Provides an indication if losses are to be ignored for this metered subsystem zone.
lossFactor	0..1	Float	This is the default loss factor for the Metered Sub-System (MSS) zone. The actual losses are calculated during the RT market.
rucGrossSettlement	0..1	YesNo	Metered Sub-System (MSS) Load Following may select Net vs. Gross settlement. Net Settlement requires the net Demand settled at the Metered Sub-System (MSS) Load Aggregation Point (LAP) and Net Supply needs to settle at the equivalent to the weighted average price of the MSS generation. Gross load will be settled at the System LAP and the Gross supply will be settled at the LMP. MSS Aggregation that elects gross settlement shall have to identify if its resources are Load Following or not.
anodeType	0..1	AnodeType	inherited from: AggregateNode
qualifASOrder	0..1	Integer	inherited from: AggregateNode
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 566 shows all association ends of MSSZone with other classes.

Table 566 – Association ends of ReferenceData::MSSZone with other classes

mult from	name	mult to	type	description
0..*	MeteredSubSystem	0..1	MeteredSubSystem	
0..*	Pnode	0..*	Pnode	inherited from: AggregateNode
0..1	CnodeDistributionFactor	0..*	CnodeDistributionFactor	inherited from: AggregateNode
0..*	SubControlArea	0..*	SubControlArea	inherited from: AggregateNode
0..1	RegisteredResource	0..*	RegisteredResource	inherited from: AggregateNode
0..1	AreaLoadCurve	0..*	AreaLoadCurve	inherited from: AggregateNode
0..1	Instruction	0..*	Instructions	inherited from: AggregateNode
0..*	RTO	1..1	RTO	inherited from: AggregateNode
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.33 MarketPerson

General purpose information for name and other information to contact people.

Table 567 shows all attributes of MarketPerson.

Table 567 – Attributes of ReferenceData::MarketPerson

name	mult	type	description
category	0..1	String	Category of this person relative to utility operations, classified according to the utility's corporate standards and practices. Examples include employee, contractor, agent, not affiliated, etc. This field is not used to indicate whether this person is a customer of the utility. Often an employee or contractor is also a customer. Customer information is gained with relationship to Organisation and CustomerData. In similar fashion, this field does not indicate the various roles this person may fill as part of utility operations.
electronicAddressAlternate	0..1	ElectronicAddress	Alternate Electronic address.
electronicAddressPrimary	0..1	ElectronicAddress	Primary Electronic address.
firstName	0..1	String	Person's first name.
governmentID	0..1	String	Unique identifier for person relative to its governing authority, for example a federal tax identifier (such as a Social Security number in the United States).
landlinePhone	0..1	TelephoneNumber	Landline phone number.
lastName	0..1	String	Person's last (family, sir) name.
mName	0..1	String	Middle name(s) or initial(s).
mobilePhone	0..1	TelephoneNumber	Mobile phone number.
prefix	0..1	String	A prefix or title for the person's name, such as Miss, Mister, Doctor, etc.
specialNeed	0..1	String	Special service needs for the person (contact) are described; examples include life support, etc.
status	0..1	Status	
suffix	0..1	String	A suffix for the person's name, such as II, III, etc.
userID	0..1	String	The user name for the person; required to log in.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 568 shows all association ends of MarketPerson with other classes.

Table 568 – Association ends of ReferenceData::MarketPerson with other classes

mult from	name	mult to	type	description
0..1	MarketSkills	0..*	MarketSkill	
0..*	MarketParticipant	0..*	MarketParticipant	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.34 MarketQualificationRequirement

Certain skills are required and shall be certified in order for a person (typically a member of a crew) to be qualified to work on types of equipment.

Table 569 shows all attributes of MarketQualificationRequirement.

Table 569 – Attributes of ReferenceData::MarketQualificationRequirement

name	mult	type	description
effectiveDate	0..1	DateTime	Effective date of the privilege, terminate date of the privilege, or effective date of the application for the organization
expirationDate	0..1	DateTime	This is the terminate date of the application for the organization The specific organization can no longer access the application as of the terminate date
qualificationID	0..1	String	Qualification identifier.
status	0..1	Integer	The status of the privilege. Shows the status of the user's qualification. The current statuses are: 1=New, 2=Active, 3=Refused, 4=Terminated, 5=Withdrawn and it is subject to update.
statusType	0..1	String	This is the name of the status of the qualification and is used to display the status of the user's or organization's status.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 570 shows all association ends of MarketQualificationRequirement with other classes.

Table 570 – Association ends of ReferenceData::MarketQualificationRequirement with other classes

mult from	name	mult to	type	description
0..*	MarketSkills	0..*	MarketSkill	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.35 MarketRegion

A specialized class of AggregatedNode type. Defines the MarketRegions. Regions could be system Market Regions, Energy Regions or Ancillary Service Regions.

Table 571 shows all attributes of MarketRegion.

Table 571 – Attributes of ReferenceData::MarketRegion

name	mult	type	description
anodeType	0..1	AnodeType	inherited from: AggregateNode
qualifASOrder	0..1	Integer	inherited from: AggregateNode
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 572 shows all association ends of MarketRegion with other classes.

Table 572 – Association ends of ReferenceData::MarketRegion with other classes

mult from	name	mult to	type	description
1..1	ReserveDemandCurve	0..*	ReserveDemandCurve	
1..1	MarketRegionResults	1..*	MarketRegionResults	
1..1	ExPostMarketRegionResults	0..*	ExPostMarketRegionResults	
0..*	Pnode	0..*	Pnode	inherited from: AggregateNode
0..1	CnodeDistributionFactor	0..*	CnodeDistributionFactor	inherited from: AggregateNode
0..*	SubControlArea	0..*	SubControlArea	inherited from: AggregateNode
0..1	RegisteredResource	0..*	RegisteredResource	inherited from: AggregateNode
0..1	AreaLoadCurve	0..*	AreaLoadCurve	inherited from: AggregateNode
0..1	Instruction	0..*	Instructions	inherited from: AggregateNode
0..*	RTO	1..1	RTO	inherited from: AggregateNode
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.36 MarketSkill

Proficiency level of a craft, which is required to operate or maintain a particular type of asset and/or perform certain types of work.

Table 573 shows all attributes of MarketSkill.

Table 573 – Attributes of ReferenceData::MarketSkill

name	mult	type	description
certificationPeriod	0..1	DateTimeInterval	Interval between the certification and its expiry.
effectiveDateTime	0..1	DateTime	Date and time the skill became effective.
level	0..1	String	Level of skill for a Craft.
type	0..1	String	inherited from: Document
authorName	0..1	String	inherited from: Document
createdDateTime	0..1	DateTime	inherited from: Document
lastModifiedDateTime	0..1	DateTime	inherited from: Document
revisionNumber	0..1	String	inherited from: Document
electronicAddress	0..1	ElectronicAddress	inherited from: Document
subject	0..1	String	inherited from: Document
title	0..1	String	inherited from: Document
docStatus	0..1	Status	inherited from: Document
status	0..1	Status	inherited from: Document
comment	0..1	String	inherited from: Document
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 574 shows all association ends of MarketSkill with other classes.

Table 574 – Association ends of ReferenceData::MarketSkill with other classes

mult from	name	mult to	type	description
0..*	MarketQualificationRequirements	0..*	MarketQualificationRequirement	
0..*	MarketPerson	0..1	MarketPerson	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: Document
0..*	Editor	0..1	Editor	inherited from: Document
0..*	Approver	0..1	Approver	inherited from: Document
0..*	Author	0..1	Author	inherited from: Document
0..*	Issuer	0..1	Issuer	inherited from: Document
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.37 MaxStartUpCostCurve

The maximum Startup costs and time as a function of down time. Relationship between unit startup cost (Y1-axis) vs. unit elapsed down time (X-axis). This is used to validate the information provided in the Bid.

Table 575 shows all attributes of MaxStartUpCostCurve.

Table 575 – Attributes of ReferenceData::MaxStartUpCostCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 576 shows all association ends of MaxStartUpCostCurve with other classes.

**Table 576 – Association ends of ReferenceData::
MaxStartUpCostCurve with other classes**

mult from	name	mult to	type	description
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.38 MeteredSubSystem

A metered subsystem.

Table 577 shows all attributes of MeteredSubSystem.

Table 577 – Attributes of ReferenceData::MeteredSubSystem

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 578 shows all association ends of MeteredSubSystem with other classes.

Table 578 – Association ends of ReferenceData::MeteredSubSystem with other classes

mult from	name	mult to	type	description
0..1	MSSZone	0..*	MSSZone	
1..*	MSSAggregation	0..1	MSSAggregation	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.39 MktCombinedCyclePlant

Subclass of Production: CombinedCyclePlant from IEC 61970 package.

A set of combustion turbines and steam turbines where the exhaust heat from the combustion turbines is recovered to make steam for the steam turbines, resulting in greater overall plant efficiency.

Table 579 shows all attributes of MktCombinedCyclePlant.

Table 579 – Attributes of ReferenceData::MktCombinedCyclePlant

name	mult	type	description
combCyclePlantRating	0..1	ActivePower	inherited from: CombinedCyclePlant
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 580 shows all association ends of MktCombinedCyclePlant with other classes.

**Table 580 – Association ends of ReferenceData::
MktCombinedCyclePlant with other classes**

mult from	name	mult to	type	description
0..*	AggregatedPnode	0..1	AggregatedPnode	
0..1	CombinedCycleLogicalConfiguration	1..*	CombinedCycleLogicalConfiguration	
0..1	ThermalGeneratingUnits	0..*	ThermalGeneratingUnit	inherited from: CombinedCyclePlant
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.40 MktConductingEquipment

Subclass of IEC 61970:Core:ConductingEquipment.

Table 581 shows all attributes of MktConductingEquipment.

Table 581 – Attributes of ReferenceData::MktConductingEquipment

name	mult	type	description
aggregate	0..1	Boolean	inherited from: Equipment
inService	0..1	Boolean	inherited from: Equipment
networkAnalysisEnabled	0..1	Boolean	inherited from: Equipment
normallyInService	0..1	Boolean	inherited from: Equipment
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 582 shows all association ends of MktConductingEquipment with other classes.

**Table 582 – Association ends of ReferenceData::
MktConductingEquipment with other classes**

mult from	name	mult to	type	description
0..*	BaseVoltage	0..1	BaseVoltage	inherited from: ConductingEquipment
1..1	SvStatus	0..*	SvStatus	inherited from: ConductingEquipment
0..*	ProtectionEquipments	0..*	ProtectionEquipment	inherited from: ConductingEquipment
1..1	Terminals	0..*	Terminal	inherited from: ConductingEquipment
0..1	OperationalLimitSet	0..*	OperationalLimitSet	inherited from: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	inherited from: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	inherited from: Equipment
0..1	Faults	0..*	Fault	inherited from: Equipment
0..*	AdditionalEquipmentContainer	0..*	EquipmentContainer	inherited from: Equipment
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.41 MktContingency

Subclass of IEC 61970:Contingency.

Table 583 shows all attributes of MktContingency.

Table 583 – Attributes of ReferenceData::MktContingency

name	mult	type	description
loadRolloverFlag	0..1	Boolean	load change flag Flag that indicates whether load rollover and load pickup should be processed for this contingency
ltcControlFlag	0..1	Boolean	ltc enable flag Flag that indicates if LTCs regulate voltage during the solution of the contingency
participationFactorSet	0..1	String	Participation Factor flag An indication which set of generator participation factors should be used to re-allocate generation in this contingency
screeningFlag	0..1	Boolean	screening flag for outage Flag that indicated whether screening is bypassed for the contingency
mustStudy	0..1	Boolean	inherited from: Contingency
aliasName	0..1	String	inherited from: IdentifiedObject

name	mult	type	description
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 584 shows all association ends of MktContingency with other classes.

Table 584 – Association ends of ReferenceData::MktContingency with other classes

mult from	name	mult to	type	description
1..1	ContingencyConstraintLimit	0..*	ContingencyConstraintLimit	
0..1	TransferInterfaceSolutionA	0..1	TransferInterfaceSolution	
0..1	TransferInterfaceSolutionB	0..1	TransferInterfaceSolution	
1..1	ConstraintResults	0..*	ConstraintResults	
1..1	ContingencyElement	0..*	ContingencyElement	inherited from: Contingency
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.42 MktHeatRateCurve

Subclass of IEC 61970: Generation: Production:HeatRateCurve.

Table 585 shows all attributes of MktHeatRateCurve.

Table 585 – Attributes of ReferenceData::MktHeatRateCurve

name	mult	type	description
isNetGrossP	0..1	Boolean	inherited from: HeatRateCurve
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 586 shows all association ends of MktHeatRateCurve with other classes.

Table 586 – Association ends of ReferenceData::MktHeatRateCurve with other classes

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..1	RegisteredGenerator	
1..1	ResourceVerifiableCosts	0..1	ResourceVerifiableCosts	
0..1	ThermalGeneratingUnit	1..1	ThermalGeneratingUnit	inherited from: HeatRateCurve
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.43 MktThermalGeneratingUnit

Subclass of ThermalGeneratingUnit from Production Package in IEC 61970.

Table 587 shows all attributes of MktThermalGeneratingUnit.

Table 587 – Attributes of ReferenceData::MktThermalGeneratingUnit

name	mult	type	description
oMCost	0..1	CostPerHeatUnit	inherited from: ThermalGeneratingUnit
allocSpinResP	0..1	ActivePower	inherited from: GeneratingUnit
autoCntrlMarginP	0..1	ActivePower	inherited from: GeneratingUnit
baseP	0..1	ActivePower	inherited from: GeneratingUnit
controlDeadband	0..1	ActivePower	inherited from: GeneratingUnit
controlPulseHigh	0..1	Seconds	inherited from: GeneratingUnit
controlPulseLow	0..1	Seconds	inherited from: GeneratingUnit
controlResponseRate	0..1	ActivePowerChangeRate	inherited from: GeneratingUnit
efficiency	0..1	PerCent	inherited from: GeneratingUnit
genControlMode	0..1	GeneratorControlMode	inherited from: GeneratingUnit
genControlSource	0..1	GeneratorControlSource	inherited from: GeneratingUnit
governorMPL	0..1	PU	inherited from: GeneratingUnit
governorSCD	0..1	PerCent	inherited from: GeneratingUnit
highControlLimit	0..1	ActivePower	inherited from: GeneratingUnit
initialP	0..1	ActivePower	inherited from: GeneratingUnit
longPF	0..1	Float	inherited from: GeneratingUnit
lowControlLimit	0..1	ActivePower	inherited from: GeneratingUnit
lowerRampRate	0..1	ActivePowerChangeRate	inherited from: GeneratingUnit
maxEconomicP	0..1	ActivePower	inherited from: GeneratingUnit
maximumAllowableSpinningReserve	0..1	ActivePower	inherited from: GeneratingUnit
maxOperatingP	0..1	ActivePower	inherited from: GeneratingUnit
minEconomicP	0..1	ActivePower	inherited from: GeneratingUnit

name	mult	type	description
minimumOffTime	0..1	Seconds	inherited from: GeneratingUnit
minOperatingP	0..1	ActivePower	inherited from: GeneratingUnit
modelDetail	0..1	Classification	inherited from: GeneratingUnit
nominalP	0..1	ActivePower	inherited from: GeneratingUnit
normalPF	0..1	Float	inherited from: GeneratingUnit
penaltyFactor	0..1	Float	inherited from: GeneratingUnit
raiseRampRate	0..1	ActivePowerChangeRate	inherited from: GeneratingUnit
ratedGrossMaxP	0..1	ActivePower	inherited from: GeneratingUnit
ratedGrossMinP	0..1	ActivePower	inherited from: GeneratingUnit
ratedNetMaxP	0..1	ActivePower	inherited from: GeneratingUnit
shortPF	0..1	Float	inherited from: GeneratingUnit
startupCost	0..1	Money	inherited from: GeneratingUnit
startupTime	0..1	Seconds	inherited from: GeneratingUnit
tieLinePF	0..1	Float	inherited from: GeneratingUnit
totalEfficiency	0..1	PerCent	inherited from: GeneratingUnit
variableCost	0..1	Money	inherited from: GeneratingUnit
aggregate	0..1	Boolean	inherited from: Equipment
inService	0..1	Boolean	inherited from: Equipment
networkAnalysisEnabled	0..1	Boolean	inherited from: Equipment
normallyInService	0..1	Boolean	inherited from: Equipment
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 588 shows all association ends of MktThermalGeneratingUnit with other classes.

**Table 588 – Association ends of ReferenceData::
MktThermalGeneratingUnit with other classes**

mult from	name	mult to	type	description
1..1	CombinedCycleConfigurationMember	0..*	CombinedCycleConfigurationMember	
0..1	CAESPlant	0..1	CAESPlant	inherited from: ThermalGeneratingUnit
0..*	CogenerationPlant	0..1	CogenerationPlant	inherited from: ThermalGeneratingUnit
0..*	CombinedCyclePlant	0..1	CombinedCyclePlant	inherited from: ThermalGeneratingUnit
1..1	EmissionAccounts	0..*	EmissionAccount	inherited from: ThermalGeneratingUnit
1..1	EmissionCurves	0..*	EmissionCurve	inherited from: ThermalGeneratingUnit
1..1	FossilFuels	0..*	FossilFuel	inherited from: ThermalGeneratingUnit
1..1	FuelAllocationSchedules	0..*	FuelAllocationSchedule	inherited from: ThermalGeneratingUnit
1..1	HeatInputCurve	0..1	HeatInputCurve	inherited from: ThermalGeneratingUnit
1..1	HeatRateCurve	0..1	HeatRateCurve	inherited from: ThermalGeneratingUnit
1..1	IncrementalHeatRateCurve	0..1	IncrementalHeatRateCurve	inherited from: ThermalGeneratingUnit
1..1	ShutdownCurve	0..1	ShutdownCurve	inherited from: ThermalGeneratingUnit

mult from	name	mult to	type	description
1..1	StartupModel	0..1	StartupModel	inherited from: ThermalGeneratingUnit
0..1	RotatingMachine	0..*	RotatingMachine	inherited from: GeneratingUnit
1..1	GenUnitOpCostCurves	0..*	GenUnitOpCostCurve	inherited from: GeneratingUnit
1..1	GenUnitOpSchedule	0..1	GenUnitOpSchedule	inherited from: GeneratingUnit
1..1	ControlAreaGeneratingUnit	0..*	ControlAreaGeneratingUnit	inherited from: GeneratingUnit
1..1	GrossToNetActivePowerCurves	0..*	GrossToNetActivePowerCurve	inherited from: GeneratingUnit
0..1	OperationalLimitSet	0..*	OperationalLimitSet	inherited from: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	inherited from: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	inherited from: Equipment
0..1	Faults	0..*	Fault	inherited from: Equipment
0..*	AdditionalEquipmentContainer	0..*	EquipmentContainer	inherited from: Equipment
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.44 OilPrice root class

Price of oil in monetary units.

Table 589 shows all attributes of OilPrice.

Table 589 – Attributes of ReferenceData::OilPrice

name	mult	type	description
oilPriceIndex	0..1	Float	The average oil price at a defined fuel region.

Table 590 shows all association ends of OilPrice with other classes.

Table 590 – Association ends of ReferenceData::OilPrice with other classes

mult from	name	mult to	type	description
1..1	FuelRegion	1..1	FuelRegion	

6.5.9.45 OrgPnodeAllocation

This class models the allocation between asset owners and pricing nodes.

Table 591 shows all attributes of OrgPnodeAllocation.

Table 591 – Attributes of ReferenceData::OrgPnodeAllocation

name	mult	type	description
maxMWAllocation	0..1	ActivePower	Maximum MW for the Source/Sink for the Allocation
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 592 shows all association ends of OrgPnodeAllocation with other classes.

Table 592 – Association ends of ReferenceData::OrgPnodeAllocation with other classes

mult from	name	mult to	type	description
0..*	Pnode	1..1	Pnode	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.46 OrgResOwnership

This class model the ownership percent and type of ownership between resource and organisation.

Table 593 shows all attributes of OrgResOwnership.

Table 593 – Attributes of ReferenceData::OrgResOwnership

name	mult	type	description
asscType	0..1	ResourceAssnType	association type for the association between Organisation and Resource:
masterSchedulingCoordinatorFlag	0..1	YesNo	Flag to indicate that the SC representing the Resource is the Master SC.
ownershipPercent	0..1	PerCent	ownership percentage for each resource
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 594 shows all association ends of OrgResOwnership with other classes.

Table 594 – Association ends of ReferenceData::OrgResOwnership with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	1..1	RegisteredResource	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.47 Pnode

A pricing node is directly associated with a connectivity node. It is a pricing location for which market participants submit their bids, offers, buy/sell CRRs, and settle.

Table 595 shows all attributes of Pnode.

Table 595 – Attributes of ReferenceData::Pnode

name	mult	type	description
isPublic	0..1	Boolean	If true, this Pnode is public (prices are published for DA/RT and FTR markets), otherwise it is private (location is not usable by market for bidding/FTRs/transactions).
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 596 shows all association ends of Pnode with other classes.

Table 596 – Association ends of ReferenceData::Pnode with other classes

mult from	name	mult to	type	description
0..1	RegisteredResources	0..*	RegisteredResource	A registered resource injects power at one or more connectivity nodes related to a pnode
0..*	SourceCRRSegment	0..*	CRRSegment	
0..*	SinkCRRSegment	0..*	CRRSegment	
0..1	MktMeasurement	0..*	MktMeasurement	Allows Measurements to be associated to Pnodes.
1..1	ExPostResults	0..*	ExPostPricingResults	
0..1	PnodeResults	1..*	PnodeResults	
0..1	Trade	0..*	Trade	
0..1	ReceiptTransactionBids	0..*	TransactionBid	
0..1	DeliveryTransactionBids	0..*	TransactionBid	
0..*	SubControlArea	0..1	SubControlArea	
1..1	CommodityDefinition	0..*	CommodityDefinition	
0..*	AggregateNode	0..*	AggregateNode	

mult from	name	mult to	type	description
1..1	OrgPnodeAllocation	0..*	OrgPnodeAllocation	
0..*	RTO	0..1	RTO	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.48 PnodeDistributionFactor root class

This class allows SC to input different distribution factors for pricing node.

Table 597 shows all attributes of PnodeDistributionFactor.

Table 597 – Attributes of ReferenceData::PnodeDistributionFactor

name	mult	type	description
factor	0..1	Float	Used to calculate "participation" of Pnode in an AggregatePnode. For example, for regulation region this factor is 1 and total sum of all factors for a specific regulation region does not have to be 1. For pricing zone the total sum of all factors has to be 1.
offPeak	0..1	YesNo	Indication that this distribution factor is to apply during off peak.
onPeak	0..1	YesNo	Indication that this factor is to apply during Peak periods.
podLossFactor	0..1	Float	Point of delivery loss factor

Table 598 shows all association ends of PnodeDistributionFactor with other classes.

Table 598 – Association ends of ReferenceData::PnodeDistributionFactor with other classes

mult from	name	mult to	type	description
0..*	BidDistributionFactor	0..1	BidDistributionFactor	
1..*	AggregatedPnode	1..1	AggregatedPnode	
0..*	IndividualPnode	1..1	IndividualPnode	

6.5.9.49 RMRHeatRateCurve

Model to support processing of reliability must run units.

Table 599 shows all attributes of RMRHeatRateCurve.

Table 599 – Attributes of ReferenceData::RMRHeatRateCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 600 shows all association ends of RMRHeatRateCurve with other classes.

Table 600 – Association ends of ReferenceData::RMRHeatRateCurve with other classes

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..1	RegisteredGenerator	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.50 RMRStartUpCostCurve

Model to support processing of reliability must run units.

Table 601 shows all attributes of RMRStartUpCostCurve.

Table 601 – Attributes of ReferenceData::RMRStartUpCostCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve

name	mult	type	description
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 602 shows all association ends of RMRStartUpCostCurve with other classes.

**Table 602 – Association ends of ReferenceData::
RMRStartUpCostCurve with other classes**

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..1	RegisteredGenerator	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.51 RMRStartUpEnergyCurve

Model to support processing of reliability must run units.

Table 603 shows all attributes of RMRStartUpEnergyCurve.

Table 603 – Attributes of ReferenceData::RMRStartUpEnergyCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 604 shows all association ends of RMRStartUpEnergyCurve with other classes.

Table 604 – Association ends of ReferenceData::RMRStartUpEnergyCurve with other classes

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..1	RegisteredGenerator	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.52 RMRStartUpFuelCurve

Model to support processing of reliability must run units.

Table 605 shows all attributes of RMRStartUpFuelCurve.

Table 605 – Attributes of ReferenceData::RMRStartUpFuelCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 606 shows all association ends of RMRStartUpFuelCurve with other classes.

Table 606 – Association ends of ReferenceData::RMRStartUpFuelCurve with other classes

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..1	RegisteredGenerator	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.53 RMRStartUpTimeCurve

Model to support processing of reliability must run units.

Table 607 shows all attributes of RMRStartUpTimeCurve.

Table 607 – Attributes of ReferenceData::RMRStartUpTimeCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 608 shows all association ends of RMRStartUpTimeCurve with other classes.

Table 608 – Association ends of ReferenceData::RMRStartUpTimeCurve with other classes

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..1	RegisteredGenerator	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.54 RTO

Regional transmission operator.

Table 609 shows all attributes of RTO.

Table 609 – Attributes of ReferenceData::RTO

name	mult	type	description
streetAddress	0..1	StreetAddress	inherited from: Organisation
postalAddress	0..1	StreetAddress	inherited from: Organisation
phone1	0..1	TelephoneNumber	inherited from: Organisation
phone2	0..1	TelephoneNumber	inherited from: Organisation
electronicAddress	0..1	ElectronicAddress	inherited from: Organisation
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 610 shows all association ends of RTO with other classes.

Table 610 – Association ends of ReferenceData::RTO with other classes

mult from	name	mult to	type	description
1..1	MktConnectivityNode	0..*	MktConnectivityNode	
1..1	CommodityDefinition	0..*	CommodityDefinition	
1..1	AdjacentCaset	0..*	AdjacentCaset	
1..1	AggregateNode	0..*	AggregateNode	
1..1	TransmissionContractRight	0..*	ContractRight	
1..1	FuelRegion	0..*	FuelRegion	
1..1	HostControlArea	0..*	HostControlArea	
1..1	LocalReliabilityArea	0..*	LocalReliabilityArea	
0..1	Pnodes	0..*	Pnode	
1..1	TransmissionRightChain	0..*	TransmissionRightChain	

mult from	name	mult to	type	description
1..1	SubControlArea	0..*	SubControlArea	
0..1	EnergyMarkets	0..*	EnergyMarket	
0..1	SecurityConstraintsLinear	0..*	SecurityConstraintSum	
0..1	SecurityConstraints	0..*	SecurityConstraints	
1..1	MSSAggregation	0..*	MSSAggregation	
0..*	MarketPerson	0..*	MarketPerson	inherited from: MarketParticipant
0..*	MarketDocument	0..*	MarketDocument	inherited from: MarketParticipant
0..1	SchedulingCoordinator	0..*	SchedulingCoordinator	inherited from: MarketParticipant
0..1	RegisteredResource	0..*	RegisteredResource	inherited from: MarketParticipant
0..1	Bid	0..*	Bid	inherited from: MarketParticipant
0..*	TimeSeries	0..*	TimeSeries	inherited from: MarketParticipant
0..*	MarketRole	0..*	MarketRole	inherited from: MarketParticipant
0..*	ParentOrganisation	0..1	ParentOrganization	inherited from: Organisation
0..1	Roles	0..*	OrganisationRole	inherited from: Organisation
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.55 RUCZone

A specialized class of type AggregatedNode type. Defines RUC Zones. A forecast region represents a collection of Nodes for which the Market operator has developed sufficient historical demand and relevant weather data to perform a demand forecast for such area. The Market Operator may further adjust this forecast to ensure that the Reliability Unit Commitment produces adequate local capacity procurement.

Table 611 shows all attributes of RUCZone.

Table 611 – Attributes of ReferenceData::RUCZone

name	mult	type	description
anodeType	0..1	AnodeType	inherited from: AggregateNode
qualifASOrder	0..1	Integer	inherited from: AggregateNode
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 612 shows all association ends of RUCZone with other classes.

Table 612 – Association ends of ReferenceData::RUCZone with other classes

mult from	name	mult to	type	description
0..1	LossClearingResults	0..*	LossClearingResults	
0..*	Pnode	0..*	Pnode	inherited from: AggregateNode
0..1	CnodeDistributionFactor	0..*	CnodeDistributionFactor	inherited from: AggregateNode
0..*	SubControlArea	0..*	SubControlArea	inherited from: AggregateNode
0..1	RegisteredResource	0..*	RegisteredResource	inherited from: AggregateNode
0..1	AreaLoadCurve	0..*	AreaLoadCurve	inherited from: AggregateNode
0..1	Instruction	0..*	Instructions	inherited from: AggregateNode
0..*	RTO	1..1	RTO	inherited from: AggregateNode
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.56 RegisteredDistributedResource

A registered resource that represents a distributed energy resource, such as a micro-generator, fuel cell, photo-voltaic energy source, etc.

Table 613 shows all attributes of RegisteredDistributedResource.

Table 613 – Attributes of ReferenceData::RegisteredDistributedResource

name	mult	type	description
distributedResourceType	0..1	String	The type of resource. Examples include: fuel cell, flywheel, photovoltaic, micro-turbine, CHP (combined heat power), V2G (vehicle to grid), DES (distributed energy storage), and others.
ACAFlag	0..1	YesNo	inherited from: RegisteredResource
ASSPOptimizationFlag	0..1	YesNo	inherited from: RegisteredResource
commercialOpDate	0..1	DateTime	inherited from: RegisteredResource
contingencyAvailFlag	0..1	YesNo	inherited from: RegisteredResource
dispatchable	0..1	Boolean	inherited from: RegisteredResource
ECAFlag	0..1	YesNo	inherited from: RegisteredResource
flexibleOfferFlag	0..1	YesNo	inherited from: RegisteredResource
hourlyPredispatch	0..1	YesNo	inherited from: RegisteredResource
isAggregatedRes	0..1	YesNo	inherited from: RegisteredResource
lastModified	0..1	DateTime	inherited from: RegisteredResource
LMPMFlag	0..1	YesNo	inherited from: RegisteredResource
marketParticipationFlag	0..1	YesNo	inherited from: RegisteredResource
maxBaseSelfSchedQty	0..1	Float	inherited from: RegisteredResource
maxOnTime	0..1	Float	inherited from: RegisteredResource
minDispatchTime	0..1	Hours	inherited from: RegisteredResource
minOffTime	0..1	Float	inherited from: RegisteredResource
minOnTime	0..1	Float	inherited from: RegisteredResource

name	mult	type	description
mustOfferFlag	0..1	YesNo	inherited from: RegisteredResource
nonMarket	0..1	YesNo	inherited from: RegisteredResource
pointOfDeliveryFlag	0..1	YesNo	inherited from: RegisteredResource
priceSetFlagDA	0..1	YesNo	inherited from: RegisteredResource
priceSetFlagRT	0..1	YesNo	inherited from: RegisteredResource
registrationStatus	0..1	ResourceRegistrationStatus	inherited from: RegisteredResource
resourceAdequacyFlag	0..1	YesNo	inherited from: RegisteredResource
SMPMFlag	0..1	YesNo	inherited from: RegisteredResource
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 614 shows all association ends of RegisteredDistributedResource with other classes.

**Table 614 – Association ends of ReferenceData::
RegisteredDistributedResource with other classes**

mult from	name	mult to	type	description
1..1	ResourcePerformanceRatings	0..*	ResourcePerformanceRating	
1..1	ResponseMethods	0..*	ResponseMethod	
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: RegisteredResource
0..*	ForbiddenRegion	0..*	ForbiddenRegion	inherited from: RegisteredResource
0..*	AggregateNode	0..1	AggregateNode	inherited from: RegisteredResource
1..1	DispatchInstReply	0..*	DispatchInstReply	inherited from: RegisteredResource
0..*	TimeSeries	0..*	TimeSeries	inherited from: RegisteredResource
0..*	RampRateCurve	0..*	RampRateCurve	inherited from: RegisteredResource
0..1	ContractDistributionFactor	0..*	ContractDistributionFactor	inherited from: RegisteredResource
1..1	OrgResOwnership	0..*	OrgResOwnership	inherited from: RegisteredResource
0..1	RMROperatorInput	0..*	RMROperatorInput	inherited from: RegisteredResource
0..1	ResourceDispatchResults	0..*	ResourceDispatchResults	inherited from: RegisteredResource
0..1	SubstitutionResourceList	0..*	SubstitutionResourceList	inherited from: RegisteredResource
0..*	AdjacentCASet	0..1	AdjacentCASet	inherited from: RegisteredResource
0..*	SubControlArea	0..*	SubControlArea	inherited from: RegisteredResource
1..1	IntermittentResourceEligibility	0..*	IntermittentResourceEligibility	inherited from: RegisteredResource
1..1	FormerReference	0..*	FormerReference	inherited from: RegisteredResource
1..1	Commitments	0..*	Commitments	inherited from: RegisteredResource
0..1	MPMResourceStatus	0..*	MPMResourceStatus	inherited from: RegisteredResource
0..1	RUCAwardInstruction	0..*	RUCAwardInstruction	inherited from: RegisteredResource
0..1	AllocationResultValues	0..*	AllocationResultValues	inherited from: RegisteredResource
1..1	LoadFollowingInst	0..*	LoadFollowingInst	inherited from: RegisteredResource

mult from	name	mult to	type	description
0..1	ResourceLoadFollowingInst	0..*	ResourceLoadFollowingInst	inherited from: RegisteredResource
1..1	ResourceAncillaryServiceQualification	0..*	ResourceCertification	inherited from: RegisteredResource
0..1	ExpectedEnergyValues	0..*	ExpectedEnergyValues	inherited from: RegisteredResource
0..*	Reason	0..*	Reason	inherited from: RegisteredResource
0..*	InterTie	0..*	SchedulingPoint	inherited from: RegisteredResource
0..*	MktConnectivityNode	0..1	MktConnectivityNode	inherited from: RegisteredResource
0..1	DopInstruction	0..*	DopInstruction	inherited from: RegisteredResource
0..*	ResourceCapacity	0..*	ResourceCapacity	inherited from: RegisteredResource
1..1	ResourceVerifiableCosts	0..1	ResourceVerifiableCosts	inherited from: RegisteredResource
1..1	DefaultBid	0..1	DefaultBid	inherited from: RegisteredResource
0..*	MarketObjectStatus	0..*	MarketObjectStatus	inherited from: RegisteredResource
0..*	ControlAreaDesignation	0..*	ControlAreaDesignation	inherited from: RegisteredResource
0..1	LoadFollowingOperatorInput	0..*	LoadFollowingOperatorInput	inherited from: RegisteredResource
0..*	MPMTestThreshold	0..*	MPMTestThreshold	inherited from: RegisteredResource
0..1	ResourceAwardInstruction	0..*	ResourceAwardInstruction	inherited from: RegisteredResource
0..1	ExPostResourceResults	0..*	ExPostResourceResults	inherited from: RegisteredResource
1..1	Instructions	0..*	Instructions	inherited from: RegisteredResource
0..*	Pnode	0..1	Pnode	inherited from: RegisteredResource
0..*	HostControlArea	0..1	HostControlArea	inherited from: RegisteredResource
0..*	Domain	0..*	Domain	inherited from: RegisteredResource
0..*	EnergyMarkets	0..*	EnergyMarket	inherited from: RegisteredResource
0..1	DotInstruction	0..*	DotInstruction	inherited from: RegisteredResource
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.57 RegisteredGenerator

Model of a generator that is registered to participate in the market.

Table 615 shows all attributes of RegisteredGenerator.

Table 615 – Attributes of ReferenceData::RegisteredGenerator

name	mult	type	description
capacityFactor	0..1	PerCent	The ratio of actual energy produced by resource divided by the maximum potential energy if the resource is fully utilized. As an example, wind farms.
coldStartTime	0..1	Float	Cold start time.
combinedCycleOperatingMode	0..1	String	Combined Cycle operating mode.
commercialOperationDate	0..1	DateTime	
constrainedOutputFlag	0..1	YesNo	Constrained Output Generator (COG) Indicator (Yes/No), per Generating Resource
energyDownRampRate	0..1	ActivePowerChangeRate	Response rate in MW per minute for ramping energy down.
energyUpRampRate	0..1	ActivePowerChangeRate	Response rate in MW per minute for ramping energy up.
extremeLongStart	0..1	YesNo	Some long-start up time units may need to receive start up instruction before DA market results are available. Long-Start resources may be either physical resources within the control with start-up times greater than 18 hours or the long-start contractual inter-tie commitment that shall be completed by 6 am one-day ahead. Therefore, there is a need for a process to determine the commitment of such resources before the DA market.
fuelSource	0..1	FuelSource	Values: Natural Gas Based Resource, Non Natural Gas Based Resource "NG" – Natural-Gas-Based Resource – a Resource that is powered by Natural Gas "NNG" – Non-Natural-Gas-Based Resource – a Resource that is powered by some other fuel than Natural Gas
highControlLimit	0..1	ActivePower	High limit for secondary (AGC) control
hotIntTime	0..1	Float	Hot-to-intermediate time (Seasonal)
hotStartTime	0..1	Float	Hot start time.
intColdTime	0..1	Float	Intermediate-to-cold time (Seasonal)
intStartTime	0..1	Float	Intermediate start time.
loadFollowingDownMSS	0..1	YesNo	Certifies resources for use in MSS Load Following Down
loadFollowingUpMSS	0..1	YesNo	Certifies resources for use in MSS Load Following Up
lowControlLimit	0..1	ActivePower	Low limit for secondary (AGC) control
maxDependableCap	0..1	ActivePower	Maximum Dependable Capacity (MNDC). Maximum Net Dependable Capacity is used in association with an RMR contract.
maximumAllowableSpinningReserve	0..1	ActivePower	Maximum allowable spinning reserve. Spinning reserve will never be considered greater than this value regardless of the current operating point.
maximumOperatingLimit	0..1	ActivePower	This is the maximum operating MW limit the dispatcher can enter for this unit
maxMinLoadCost	0..1	CostRate	The registered maximum Minimum Load Cost of a Generating Resource registered with a Cost Basis of "Bid Cost".
maxPumpingLevel	0..1	ActivePower	max pumping level of a hydro pump unit
maxShutdownTime	0..1	DateTime	Maximum time this device can be shut down.
maxStartUpsPerDay	0..1	Integer	maximum start ups per day
maxWeeklyEnergy	0..1	Float	Maximum weekly Energy (Seasonal)
maxWeeklyStarts	0..1	Integer	Maximum weekly starts (seasonal parameter)

name	mult	type	description
minimumLoadCostBasis	0..1	CostBasis	The cost basis for minimum load.
minimumLoadFuelCost	0..1	CostPerHeatUnit	The cost for the fuel required to get a Generating Resource to operate at the minimum load level
minimumOperatingLimit	0..1	ActivePower	This is the minimum operating MW limit the dispatcher can enter for this unit.
minLoadCost	0..1	CostRate	minimum load cost. Value is (currency/hr)
mustOfferRA	0..1	YesNo	Flag to indicate that this unit is a resource adequacy resource and must offer.
nameplateCapacity	0..1	ActivePower	MW value stated on the nameplate of the Generator -- the value it potentially could provide.
operatingMaintenanceCost	0..1	CostPerEnergyUnit	The portion of the Operating Cost of a Generating Resource that is not related to fuel cost.
pumpingCost	0..1	CostRate	
pumpingFactor	0..1	Float	Pumping factor for pump storage units, conversion factor between generating and pumping.
pumpMinDownTime	0..1	Float	The minimum down time for the pump in a pump storage unit.
pumpMinUpTime	0..1	Float	The minimum up time aspect for the pump in a pump storage unit
pumpShutdownCost	0..1	Float	The cost to shutdown a pump during the pump aspect of a pump storage unit.
pumpShutdownTime	0..1	Integer	The shutdown time (minutes) of the pump aspect of a pump storage unit.
quickStartFlag	0..1	YesNo	Quick start flag (Yes/No). Identifies the registered generator as a quick start unit. A quick start unit is a unit that has the ability to be available for load within a 30 minute period.
rampCurveType	0..1	RampCurveType	Ramp curve type. Identifies the type of curve which may be a fixed, static or dynamic.
regulationDownRampRate	0..1	ActivePowerChangeRate	Regulation down response rate in MW per minute
regulationFlag	0..1	UnitRegulationKind	Specifies if the unit is regulating or not regulating or expected to be regulating but is not.
regulationUpRampRate	0..1	ActivePowerChangeRate	Regulation up response rate in MW per minute.
resourceSubType	0..1	String	Unit sub type used by Settlements or scheduling application. Application use of the unit sub type may define the necessary types as applicable.
riverSystem	0..1	String	River System the Resource is tied to.
RMNRFlag	0..1	YesNo	Reliability must not run (RMNR) flag: indicated whether the RMR unit is set as an RMNR in the current market
RMRFlag	0..1	FlagTypeRMR	Reliability must run (RMR) flag: indicates whether the unit is RMR; Indicates whether the unit is RMR: N' – not an RMR unit '1' – RMR Condition 1 unit '2' – RMR Condition 2 unit
RMRManualIndicator	0..1	YesNo	Indicates the RMR Manual pre-determination status [Y/N]
RMTFlag	0..1	YesNo	Reliability must take (RMT) flag (Yes/No): indicates whether the unit is RMT
spinRampRate	0..1	ActivePowerChangeRate	Response rate in MW per minute for spinning reserve.
startUpCostBasis	0..1	CostBasis	The cost basis for start up.
syncCondCapable	0..1	YesNo	Is the Resource Synchronous Condenser capable Resource?
unitType	0..1	UnitType	Generating unit type: Combined Cycle, Gas

name	mult	type	description
			Turbine, Hydro Turbine, Other, Photovoltaic, Hydro Pump-Turbine, Reciprocating Engine, Steam Turbine, Synchronous Condenser, Wind Turbine
useLimitFlag	0..1	YesNo	Use limit flag: indicates if the use-limited resource is fully scheduled (or has some slack for real-time dispatch) (Y/N)
variableEnergyResource	0..1	YesNo	Provides an indication that this resource is intending to participate in an intermittent resource program.
ACAFlag	0..1	YesNo	inherited from: RegisteredResource
ASSPOptimizationFlag	0..1	YesNo	inherited from: RegisteredResource
commercialOpDate	0..1	DateTime	inherited from: RegisteredResource
contingencyAvailFlag	0..1	YesNo	inherited from: RegisteredResource
dispatchable	0..1	Boolean	inherited from: RegisteredResource
ECAFlag	0..1	YesNo	inherited from: RegisteredResource
flexibleOfferFlag	0..1	YesNo	inherited from: RegisteredResource
hourlyPredispatch	0..1	YesNo	inherited from: RegisteredResource
isAggregatedRes	0..1	YesNo	inherited from: RegisteredResource
lastModified	0..1	DateTime	inherited from: RegisteredResource
LMPMFlag	0..1	YesNo	inherited from: RegisteredResource
marketParticipationFlag	0..1	YesNo	inherited from: RegisteredResource
maxBaseSelfSchedQty	0..1	Float	inherited from: RegisteredResource
maxOnTime	0..1	Float	inherited from: RegisteredResource
minDispatchTime	0..1	Hours	inherited from: RegisteredResource
minOffTime	0..1	Float	inherited from: RegisteredResource
minOnTime	0..1	Float	inherited from: RegisteredResource
mustOfferFlag	0..1	YesNo	inherited from: RegisteredResource
nonMarket	0..1	YesNo	inherited from: RegisteredResource
pointOfDeliveryFlag	0..1	YesNo	inherited from: RegisteredResource
priceSetFlagDA	0..1	YesNo	inherited from: RegisteredResource
priceSetFlagRT	0..1	YesNo	inherited from: RegisteredResource
registrationStatus	0..1	ResourceRegistrationStatus	inherited from: RegisteredResource
resourceAdequacyFlag	0..1	YesNo	inherited from: RegisteredResource
SMPMFlag	0..1	YesNo	inherited from: RegisteredResource
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 616 shows all association ends of RegisteredGenerator with other classes.

**Table 616 – Association ends of ReferenceData::
RegisteredGenerator with other classes**

mult from	name	mult to	type	description
0..1	GeneratingBids	0..*	GeneratingBid	
0..1	StartUpTimeCurve	0..1	StartUpTimeCurve	
0..1	Trade	0..*	Trade	
0..1	MktHeatRateCurve	0..1	MktHeatRateCurve	
0..1	RMRHeatRateCurve	0..1	RMRHeatRateCurve	
0..1	RMRStartUpCostCurve	0..1	RMRStartUpCostCurve	
0..1	RMRStartUpEnergyCurve	0..1	RMRStartUpEnergyCurve	
0..1	RMRStartUpFuelCurve	0..1	RMRStartUpFuelCurve	
0..1	RMRStartUpTimeCurve	0..1	RMRStartUpTimeCurve	
0..1	RegulatingLimit	0..1	RegulatingLimit	
0..1	StartUpFuelCurve	0..1	StartUpFuelCurve	
0..1	StartUpEnergyCurve	0..1	StartUpEnergyCurve	
0..1	AuxillaryObject	0..*	AuxiliaryObject	
1..1	EnergyPriceIndex	1..1	EnergyPriceIndex	
0..1	UnitInitialConditions	0..*	UnitInitialConditions	
0..*	StartUpCostCurves	0..*	StartUpCostCurve	
0..1	FuelCostCurve	0..1	FuelCostCurve	
0..*	FuelRegion	0..1	FuelRegion	
0..*	LocalReliabilityArea	0..1	LocalReliabilityArea	
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: RegisteredResource
0..*	ForbiddenRegion	0..*	ForbiddenRegion	inherited from: RegisteredResource
0..*	AggregateNode	0..1	AggregateNode	inherited from: RegisteredResource
1..1	DispatchInstReply	0..*	DispatchInstReply	inherited from: RegisteredResource
0..*	TimeSeries	0..*	TimeSeries	inherited from: RegisteredResource
0..*	RampRateCurve	0..*	RampRateCurve	inherited from: RegisteredResource
0..1	ContractDistributionFactor	0..*	ContractDistributionFactor	inherited from: RegisteredResource
1..1	OrgResOwnership	0..*	OrgResOwnership	inherited from: RegisteredResource
0..1	RMROperatorInput	0..*	RMROperatorInput	inherited from: RegisteredResource
0..1	ResourceDispatchResults	0..*	ResourceDispatchResults	inherited from: RegisteredResource
0..1	SubstitutionResourceList	0..*	SubstitutionResourceList	inherited from: RegisteredResource
0..*	AdjacentCASet	0..1	AdjacentCASet	inherited from: RegisteredResource
0..*	SubControlArea	0..*	SubControlArea	inherited from: RegisteredResource
1..1	IntermittentResourceEligibility	0..*	IntermittentResourceEligibility	inherited from: RegisteredResource
1..1	FormerReference	0..*	FormerReference	inherited from: RegisteredResource
1..1	Commitments	0..*	Commitments	inherited from: RegisteredResource
0..1	MPMResourceStatus	0..*	MPMResourceStatus	inherited from: RegisteredResource
0..1	RUCAwardInstruction	0..*	RUCAwardInstruction	inherited from: RegisteredResource
0..1	AllocationResultValues	0..*	AllocationResultValues	inherited from: RegisteredResource

mult from	name	mult to	type	description
1..1	LoadFollowingInst	0..*	LoadFollowingInst	inherited from: RegisteredResource
0..1	ResourceLoadFollowingInst	0..*	ResourceLoadFollowingInst	inherited from: RegisteredResource
1..1	ResourceAncillaryServiceQualification	0..*	ResourceCertification	inherited from: RegisteredResource
0..1	ExpectedEnergyValues	0..*	ExpectedEnergyValues	inherited from: RegisteredResource
0..*	Reason	0..*	Reason	inherited from: RegisteredResource
0..*	InterTie	0..*	SchedulingPoint	inherited from: RegisteredResource
0..*	MktConnectivityNode	0..1	MktConnectivityNode	inherited from: RegisteredResource
0..1	DopInstruction	0..*	DopInstruction	inherited from: RegisteredResource
0..*	ResourceCapacity	0..*	ResourceCapacity	inherited from: RegisteredResource
1..1	ResourceVerifiableCosts	0..1	ResourceVerifiableCosts	inherited from: RegisteredResource
1..1	DefaultBid	0..1	DefaultBid	inherited from: RegisteredResource
0..*	MarketObjectStatus	0..*	MarketObjectStatus	inherited from: RegisteredResource
0..*	ControlAreaDesignation	0..*	ControlAreaDesignation	inherited from: RegisteredResource
0..1	LoadFollowingOperatorInput	0..*	LoadFollowingOperatorInput	inherited from: RegisteredResource
0..*	MPMTestThreshold	0..*	MPMTestThreshold	inherited from: RegisteredResource
0..1	ResourceAwardInstruction	0..*	ResourceAwardInstruction	inherited from: RegisteredResource
0..1	ExPostResourceResults	0..*	ExPostResourceResults	inherited from: RegisteredResource
1..1	Instructions	0..*	Instructions	inherited from: RegisteredResource
0..*	Pnode	0..1	Pnode	inherited from: RegisteredResource
0..*	HostControlArea	0..1	HostControlArea	inherited from: RegisteredResource
0..*	Domain	0..*	Domain	inherited from: RegisteredResource
0..*	EnergyMarkets	0..*	EnergyMarket	inherited from: RegisteredResource
0..1	DotInstruction	0..*	DotInstruction	inherited from: RegisteredResource
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.58 RegisteredInterTie

This class represents the inter tie resource.

Table 617 shows all attributes of RegisteredInterTie.

Table 617 – Attributes of ReferenceData::RegisteredInterTie

name	mult	type	description
direction	0..1	InterTieDirection	Indicates the direction (export/import) of an InterTie resource.
energyProductType	0..1	EnergyProductType	Under each major product type, the commodity type can be applied to further specify the type.
isDCTie	0..1	YesNo	Flag to indicated whether this Inter-tie is a DC Tie.
isDynamicInterchange	0..1	YesNo	Specifies whether the inter-tie resource is registered for the dynamic interchange.
minHourlyBlockLimit	0..1	Integer	The registered upper bound of minimum hourly block for an Inter-Tie Resource.
ACAFlag	0..1	YesNo	inherited from: RegisteredResource
ASSPOptimizationFlag	0..1	YesNo	inherited from: RegisteredResource
commercialOpDate	0..1	DateTime	inherited from: RegisteredResource
contingencyAvailFlag	0..1	YesNo	inherited from: RegisteredResource
dispatchable	0..1	Boolean	inherited from: RegisteredResource
ECAFlag	0..1	YesNo	inherited from: RegisteredResource
flexibleOfferFlag	0..1	YesNo	inherited from: RegisteredResource
hourlyPredispatch	0..1	YesNo	inherited from: RegisteredResource
isAggregatedRes	0..1	YesNo	inherited from: RegisteredResource
lastModified	0..1	DateTime	inherited from: RegisteredResource
LMPMFlag	0..1	YesNo	inherited from: RegisteredResource
marketParticipationFlag	0..1	YesNo	inherited from: RegisteredResource
maxBaseSelfSchedQty	0..1	Float	inherited from: RegisteredResource
maxOnTime	0..1	Float	inherited from: RegisteredResource
minDispatchTime	0..1	Hours	inherited from: RegisteredResource
minOffTime	0..1	Float	inherited from: RegisteredResource
minOnTime	0..1	Float	inherited from: RegisteredResource
mustOfferFlag	0..1	YesNo	inherited from: RegisteredResource
nonMarket	0..1	YesNo	inherited from: RegisteredResource
pointOfDeliveryFlag	0..1	YesNo	inherited from: RegisteredResource
priceSetFlagDA	0..1	YesNo	inherited from: RegisteredResource
priceSetFlagRT	0..1	YesNo	inherited from: RegisteredResource
registrationStatus	0..1	ResourceRegistrationStatus	inherited from: RegisteredResource
resourceAdequacyFlag	0..1	YesNo	inherited from: RegisteredResource
SMPMFlag	0..1	YesNo	inherited from: RegisteredResource
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 618 shows all association ends of RegisteredInterTie with other classes.

Table 618 – Association ends of ReferenceData::RegisteredInterTie with other classes

mult from	name	mult to	type	description
1..1	InterTieDispatchResponse	0..*	InterTieDispatchResponse	
0..1	InterchangeSchedule	0..*	InterchangeSchedule	
0..1	InterTieBid	0..1	InterTieBid	
0..*	Flowgate	1..1	Flowgate	
0..*	WheelingCounterParty	0..*	WheelingCounterParty	
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: RegisteredResource
0..*	ForbiddenRegion	0..*	ForbiddenRegion	inherited from: RegisteredResource
0..*	AggregateNode	0..1	AggregateNode	inherited from: RegisteredResource
1..1	DispatchInstReply	0..*	DispatchInstReply	inherited from: RegisteredResource
0..*	TimeSeries	0..*	TimeSeries	inherited from: RegisteredResource
0..*	RampRateCurve	0..*	RampRateCurve	inherited from: RegisteredResource
0..1	ContractDistributionFactor	0..*	ContractDistributionFactor	inherited from: RegisteredResource
1..1	OrgResOwnership	0..*	OrgResOwnership	inherited from: RegisteredResource
0..1	RMROperatorInput	0..*	RMROperatorInput	inherited from: RegisteredResource
0..1	ResourceDispatchResults	0..*	ResourceDispatchResults	inherited from: RegisteredResource
0..1	SubstitutionResourceList	0..*	SubstitutionResourceList	inherited from: RegisteredResource
0..*	AdjacentCaset	0..1	AdjacentCaset	inherited from: RegisteredResource
0..*	SubControlArea	0..*	SubControlArea	inherited from: RegisteredResource
1..1	IntermittentResourceEligibility	0..*	IntermittentResourceEligibility	inherited from: RegisteredResource
1..1	FormerReference	0..*	FormerReference	inherited from: RegisteredResource
1..1	Commitments	0..*	Commitments	inherited from: RegisteredResource
0..1	MPMResourceStatus	0..*	MPMResourceStatus	inherited from: RegisteredResource
0..1	RUCAwardInstruction	0..*	RUCAwardInstruction	inherited from: RegisteredResource
0..1	AllocationResultValues	0..*	AllocationResultValues	inherited from: RegisteredResource
1..1	LoadFollowingInst	0..*	LoadFollowingInst	inherited from: RegisteredResource
0..1	ResourceLoadFollowingInst	0..*	ResourceLoadFollowingInst	inherited from: RegisteredResource
1..1	ResourceAncillaryServiceQualification	0..*	ResourceCertification	inherited from: RegisteredResource
0..1	ExpectedEnergyValues	0..*	ExpectedEnergyValues	inherited from: RegisteredResource
0..*	Reason	0..*	Reason	inherited from: RegisteredResource
0..*	InterTie	0..*	SchedulingPoint	inherited from: RegisteredResource
0..*	MktConnectivityNode	0..1	MktConnectivityNode	inherited from: RegisteredResource
0..1	DopInstruction	0..*	DopInstruction	inherited from: RegisteredResource
0..*	ResourceCapacity	0..*	ResourceCapacity	inherited from: RegisteredResource
1..1	ResourceVerifiableCosts	0..1	ResourceVerifiableCosts	inherited from: RegisteredResource
1..1	DefaultBid	0..1	DefaultBid	inherited from: RegisteredResource
0..*	MarketObjectStatus	0..*	MarketObjectStatus	inherited from: RegisteredResource
0..*	ControlAreaDesignation	0..*	ControlAreaDesignation	inherited from: RegisteredResource
0..1	LoadFollowingOperatorId	0..*	LoadFollowingOperatorId	inherited from: RegisteredResource

mult from	name	mult to	type	description
	nput		nput	
0..*	MPMTestThreshold	0..*	MPMTestThreshold	inherited from: RegisteredResource
0..1	ResourceAwardInstruction	0..*	ResourceAwardInstruction	inherited from: RegisteredResource
0..1	ExPostResourceResults	0..*	ExPostResourceResults	inherited from: RegisteredResource
1..1	Instructions	0..*	Instructions	inherited from: RegisteredResource
0..*	Pnode	0..1	Pnode	inherited from: RegisteredResource
0..*	HostControlArea	0..1	HostControlArea	inherited from: RegisteredResource
0..*	Domain	0..*	Domain	inherited from: RegisteredResource
0..*	EnergyMarkets	0..*	EnergyMarket	inherited from: RegisteredResource
0..1	DotInstruction	0..*	DotInstruction	inherited from: RegisteredResource
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.59 RegisteredLoad

Model of a load that is registered to participate in the market.

RegisteredLoad is used to model any load that is served by the wholesale market directly. RegisteredLoads may be dispatchable or non-dispatchable and may or may not have bid curves. Examples of RegisteredLoads would include: distribution company load, energy retailer load, large bulk power system connected facility load.

Loads that are served indirectly, for example – through an energy retailer or a vertical utility, should be modeled as RegisteredDistributedResources. Examples of RegisteredDistributedResources would include: distribution level storage, distribution level generation and distribution level demand response.

Table 619 shows all attributes of RegisteredLoad.

Table 619 – Attributes of ReferenceData::RegisteredLoad

name	mult	type	description
blockLoadTransfer	0..1	Boolean	Emergency operating procedure – Flag to indicate that the Resource is Block Load pseudo resource.
dynamicallyScheduledLoadResource	0..1	Boolean	Flag to indicate that a Load Resource is part of a DSR Load
dynamicallyScheduledQualification	0..1	Boolean	Qualification status (used for DSR qualification).
ACAFlag	0..1	YesNo	inherited from: RegisteredResource
ASSPOptimizationFlag	0..1	YesNo	inherited from: RegisteredResource
commercialOpDate	0..1	DateTime	inherited from: RegisteredResource
contingencyAvailFlag	0..1	YesNo	inherited from: RegisteredResource
dispatchable	0..1	Boolean	inherited from: RegisteredResource
ECAFlag	0..1	YesNo	inherited from: RegisteredResource
flexibleOfferFlag	0..1	YesNo	inherited from: RegisteredResource
hourlyPredispatch	0..1	YesNo	inherited from: RegisteredResource
isAggregatedRes	0..1	YesNo	inherited from: RegisteredResource
lastModified	0..1	DateTime	inherited from: RegisteredResource
LMPMFlag	0..1	YesNo	inherited from: RegisteredResource
marketParticipationFlag	0..1	YesNo	inherited from: RegisteredResource
maxBaseSelfSchedQty	0..1	Float	inherited from: RegisteredResource
maxOnTime	0..1	Float	inherited from: RegisteredResource
minDispatchTime	0..1	Hours	inherited from: RegisteredResource
minOffTime	0..1	Float	inherited from: RegisteredResource
minOnTime	0..1	Float	inherited from: RegisteredResource
mustOfferFlag	0..1	YesNo	inherited from: RegisteredResource
nonMarket	0..1	YesNo	inherited from: RegisteredResource
pointOfDeliveryFlag	0..1	YesNo	inherited from: RegisteredResource
priceSetFlagDA	0..1	YesNo	inherited from: RegisteredResource
priceSetFlagRT	0..1	YesNo	inherited from: RegisteredResource
registrationStatus	0..1	ResourceRegistrationStatus	inherited from: RegisteredResource
resourceAdequacyFlag	0..1	YesNo	inherited from: RegisteredResource
SMPMFlag	0..1	YesNo	inherited from: RegisteredResource
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 620 shows all association ends of RegisteredLoad with other classes.

Table 620 – Association ends of ReferenceData::RegisteredLoad with other classes

mult from	name	mult to	type	description
0..1	LoadBids	0..*	LoadBid	
0..1	AuxillaryObject	0..*	AuxiliaryObject	
0..*	MarketParticipant	0..1	MarketParticipant	inherited from: RegisteredResource
0..*	ForbiddenRegion	0..*	ForbiddenRegion	inherited from: RegisteredResource
0..*	AggregateNode	0..1	AggregateNode	inherited from: RegisteredResource
1..1	DispatchInstReply	0..*	DispatchInstReply	inherited from: RegisteredResource
0..*	TimeSeries	0..*	TimeSeries	inherited from: RegisteredResource
0..*	RampRateCurve	0..*	RampRateCurve	inherited from: RegisteredResource
0..1	ContractDistributionFactor	0..*	ContractDistributionFactor	inherited from: RegisteredResource
1..1	OrgResOwnership	0..*	OrgResOwnership	inherited from: RegisteredResource
0..1	RMROperatorInput	0..*	RMROperatorInput	inherited from: RegisteredResource
0..1	ResourceDispatchResults	0..*	ResourceDispatchResults	inherited from: RegisteredResource
0..1	SubstitutionResourceList	0..*	SubstitutionResourceList	inherited from: RegisteredResource
0..*	AdjacentCaset	0..1	AdjacentCaset	inherited from: RegisteredResource
0..*	SubControlArea	0..*	SubControlArea	inherited from: RegisteredResource
1..1	IntermittentResourceEligibility	0..*	IntermittentResourceEligibility	inherited from: RegisteredResource
1..1	FormerReference	0..*	FormerReference	inherited from: RegisteredResource
1..1	Commitments	0..*	Commitments	inherited from: RegisteredResource
0..1	MPMResourceStatus	0..*	MPMResourceStatus	inherited from: RegisteredResource
0..1	RUCAwardInstruction	0..*	RUCAwardInstruction	inherited from: RegisteredResource
0..1	AllocationResultValues	0..*	AllocationResultValues	inherited from: RegisteredResource
1..1	LoadFollowingInst	0..*	LoadFollowingInst	inherited from: RegisteredResource
0..1	ResourceLoadFollowingInst	0..*	ResourceLoadFollowingInst	inherited from: RegisteredResource
1..1	ResourceAncillaryServiceQualification	0..*	ResourceCertification	inherited from: RegisteredResource
0..1	ExpectedEnergyValues	0..*	ExpectedEnergyValues	inherited from: RegisteredResource
0..*	Reason	0..*	Reason	inherited from: RegisteredResource
0..*	InterTie	0..*	SchedulingPoint	inherited from: RegisteredResource
0..*	MktConnectivityNode	0..1	MktConnectivityNode	inherited from: RegisteredResource
0..1	DopInstruction	0..*	DopInstruction	inherited from: RegisteredResource
0..*	ResourceCapacity	0..*	ResourceCapacity	inherited from: RegisteredResource
1..1	ResourceVerifiableCosts	0..1	ResourceVerifiableCosts	inherited from: RegisteredResource
1..1	DefaultBid	0..1	DefaultBid	inherited from: RegisteredResource
0..*	MarketObjectStatus	0..*	MarketObjectStatus	inherited from: RegisteredResource
0..*	ControlAreaDesignation	0..*	ControlAreaDesignation	inherited from: RegisteredResource
0..1	LoadFollowingOperatorInput	0..*	LoadFollowingOperatorInput	inherited from: RegisteredResource
0..*	MPMTestThreshold	0..*	MPMTestThreshold	inherited from: RegisteredResource
0..1	ResourceAwardInstruction	0..*	ResourceAwardInstruction	inherited from: RegisteredResource
0..1	ExPostResourceResults	0..*	ExPostResourceResults	inherited from: RegisteredResource
1..1	Instructions	0..*	Instructions	inherited from: RegisteredResource
0..*	Pnode	0..1	Pnode	inherited from: RegisteredResource
0..*	HostControlArea	0..1	HostControlArea	inherited from: RegisteredResource
0..*	Domain	0..*	Domain	inherited from: RegisteredResource
0..*	EnergyMarkets	0..*	EnergyMarket	inherited from: RegisteredResource

mult from	name	mult to	type	description
0..1	DotInstruction	0..*	DotInstruction	inherited from: RegisteredResource
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.60 RegulatingLimit

This class represents the physical characteristic of a generator regarding the regulating limit.

Table 621 shows all attributes of RegulatingLimit.

Table 621 – Attributes of ReferenceData::RegulatingLimit

name	mult	type	description
highLimit	0..1	ActivePower	
lowLimit	0..1	ActivePower	
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 622 shows all association ends of RegulatingLimit with other classes.

Table 622 – Association ends of ReferenceData::RegulatingLimit with other classes

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..1	RegisteredGenerator	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.61 ResourceCertification root class

Specifies certification for a resource to participate in a specific markets.

Table 623 shows all attributes of ResourceCertification.

Table 623 – Attributes of ReferenceData::ResourceCertification

name	mult	type	description
market	0..1	MarketType	market type
qualificationFlag	0..1	YesNo	Status of the qualification ('Y' = Active, 'N' = Inactive)
type	0..1	ResourceCertificationKind	Type of service based on ResourceAncillaryServiceType enumeration

Table 624 shows all association ends of ResourceCertification with other classes.

Table 624 – Association ends of ReferenceData::ResourceCertification with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	1..1	RegisteredResource	RegisteredResources are qualified for resource ancillary service types (which include market product types as well as other types such as BlackStart) by the association to the class ResourceAncillaryServiceQualification.

6.5.9.62 ResourceOperationMaintenanceCost

To model the Operation and Maintenance (O and M) costs of a generation resource.

Table 625 shows all attributes of ResourceOperationMaintenanceCost.

Table 625 – Attributes of ReferenceData::ResourceOperationMaintenanceCost

name	mult	type	description
gasPercentAboveLowSustainedLimit	0..1	PerCent	Percentage of Fuel Index Price (gas) for operating above Low Sustained Limit (LSL)
oilPercentAboveLowSustainedLimit	0..1	PerCent	Percentage of Fuel Oil Price (FOP) for operating above Low Sustained Limit (LSL)
omCostColdStartup	0..1	Float	Verifiable O&M Cost (\$), Cold Startup
omCostHotStartup	0..1	Float	Verifiable O&M Cost (\$), Hot Startup
omCostIntermediateStartup	0..1	Float	Verifiable O&M Cost (\$), Intermediate Startup
omCostLowSustainedLimit	0..1	Float	Verifiable O&M Cost (\$/MWh), LSL
solidfuelPercentAboveLowSustainedLimit	0..1	PerCent	Percentage of Solid Fuel for operating above Low Sustained Limit (LSL)
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 626 shows all association ends of ResourceOperationMaintenanceCost with other classes.

Table 626 – Association ends of ReferenceData::ResourceOperationMaintenanceCost with other classes

mult from	name	mult to	type	description
1..1	ResourceVerifiableCosts	0..1	ResourceVerifiableCosts	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.63 ResourceStartupCost root class

To model the startup costs of a generation resource.

Table 627 shows all attributes of ResourceStartupCost.

Table 627 – Attributes of ReferenceData::ResourceStartupCost

name	mult	type	description
fuelColdStartup	0..1	Float	Verifiable Cold Start Up Fuel (MMBtu per start)
fuelHotStartup	0..1	Float	Verifiable Hot Start Up Fuel (MMBtu per start)
fuelIntermediateStartup	0..1	Float	Verifiable Intermediate Start Up Fuel (MMBtu per start)
fuelLowSustainedLimit	0..1	Float	Minimum-Energy fuel, MMBtu/MWh
gasPercentColdStartup	0..1	PerCent	Percentage of Fuel Index Price (gas) for cold startup
gasPercentHotStartup	0..1	PerCent	Percentage of Fuel Index Price (gas) for hot startup
gasPercentIntermediateStartup	0..1	PerCent	Percentage of Fuel Index Price (gas) for intermediate startup
gasPercentLowSustainedLimit	0..1	PerCent	Percentage of FIP (gas) for operating at LSL
oilPercentColdStartup	0..1	PerCent	Percentage of Fuel Oil Price (FOP) for cold startup
oilPercentHotStartup	0..1	PerCent	Percentage of Fuel Oil Price (FOP) for hot startup
oilPercentIntermediateStartup	0..1	PerCent	Percentage of Fuel Oil Price (FOP) for intermediate startup
oilPercentLowSustainedLimit	0..1	PerCent	Percentage of FOP (oil) for operating at LSL

name	mult	type	description
solidfuelPercentColdStartup	0..1	PerCent	Percentage of Solid Fuel for cold startup
solidfuelPercentHotStartup	0..1	PerCent	Percentage of Solid Fuel for hot startup
solidfuelPercentIntermediateStartup	0..1	PerCent	Percentage of Solid Fuel for intermediate startup
solidfuelPercentLowSustainedLimit	0..1	PerCent	Percentage of Solid Fuel for operating at LSL

Table 628 shows all association ends of ResourceStartupCost with other classes.

**Table 628 – Association ends of ReferenceData::
ResourceStartupCost with other classes**

mult from	name	mult to	type	description
0..*	ResourceVerifiableCosts	1..1	ResourceVerifiableCosts	

6.5.9.64 ResourceVerifiableCosts root class

This class is defined to describe the verifiable costs associated with a generation resource.

Table 629 shows all association ends of ResourceVerifiableCosts with other classes.

**Table 629 – Association ends of ReferenceData::
ResourceVerifiableCosts with other classes**

mult from	name	mult to	type	description
0..1	RegisteredResource	1..1	RegisteredResource	
0..1	MktHeatRateCurve	1..1	MktHeatRateCurve	
0..1	ResourceOperationMaintenanceCost	1..1	ResourceOperationMaintenanceCost	
1..1	ResourceStartupCost	0..*	ResourceStartupCost	

6.5.9.65 ResponseMethod

Specifies a category of energy usage that the demand response applies for; e.g. energy from lighting, HVAC, other.

Table 630 shows all attributes of ResponseMethod.

Table 630 – Attributes of ReferenceData::ResponseMethod

name	mult	type	description
activePower	0..1	Float	The active power value for the demand adjustment type. This supports requests to be made to a resource for some amount of active power provided by a particular response method, as specified by the method attribute (e.g. lighting, HVAC, wall mounted air conditioners, etc.).
activePowerUOM	0..1	String	The unit of measure of active power, e.g. kiloWatts (kW), megaWatts (mW), etc.
method	0..1	String	The response method (e.g. lighting, HVAC, wall mounted air conditioners, etc.).
siteMultiplier	0..1	Integer	This value provides for scaling of a response method's active power. For example, a response method of air conditioning could utilize a small amount of active power from each air conditioning unit (e.g. 0.1 kiloWatt), but the site multiplier could be used to produce a the total active power adjustment by multiplying the response method active power by this value (e.g. a building with 100 window air conditioning units, so $100 * 0.1 \text{ kW} = 10 \text{ kW}$).
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 631 shows all association ends of ResponseMethod with other classes.

Table 631 – Association ends of ReferenceData::ResponseMethod with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	1..1	RegisteredDistributedResource	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.66 SchedulingCoordinator

Market participants could be represented by Scheduling Coordinators (SCs) that are registered with the RTO/ISO. One participant could register multiple SCs with the RTO/ISO. Many market participants can do business with the RTO/ISO using a single SC. One SC could schedule multiple generators. A load scheduling point could be used by multiple SCs. Each SC could schedule load at multiple scheduling points. An inter-tie scheduling point can be used by multiple SCs. Each SC can schedule interchange at multiple inter-tie scheduling points.

Table 632 shows all attributes of SchedulingCoordinator.

Table 632 – Attributes of ReferenceData::SchedulingCoordinator

name	mult	type	description
creditFlag	0..1	YesNo	Flag to indicate creditworthiness (Y, N)
creditStartEffectiveDate	0..1	DateTime	Date that the scheduling coordinator becomes creditworthy.
lastModified	0..1	DateTime	Indication of the last time this scheduling coordinator information was modified.
qualificationStatus	0..1	String	Scheduling coordinator qualification status, Qualified, Not Qualified, or Disqualified.
scid	0..1	String	This is the short name or Scheduling Coordinator ID field.
streetAddress	0..1	StreetAddress	inherited from: Organisation
postalAddress	0..1	StreetAddress	inherited from: Organisation
phone1	0..1	TelephoneNumber	inherited from: Organisation
phone2	0..1	TelephoneNumber	inherited from: Organisation
electronicAddress	0..1	ElectronicAddress	inherited from: Organisation
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 633 shows all association ends of SchedulingCoordinator with other classes.

Table 633 – Association ends of ReferenceData::SchedulingCoordinator with other classes

mult from	name	mult to	type	description
0..*	MarketParticipant	0..1	MarketParticipant	
0..1	SubmitToSCTrade	0..*	Trade	
1..1	ToSCTrade	0..*	Trade	
1..1	FromSCTrade	0..*	Trade	
0..1	SubmitFromSCTrade	0..*	Trade	
1..1	TransmissionContractRight	0..*	ContractRight	
0..1	LoadRatio	1..1	LoadRatio	
0..*	MarketPerson	0..*	MarketPerson	inherited from: MarketParticipant
0..*	MarketDocument	0..*	MarketDocument	inherited from: MarketParticipant
0..1	SchedulingCoordinator	0..*	SchedulingCoordinator	inherited from: MarketParticipant
0..1	RegisteredResource	0..*	RegisteredResource	inherited from: MarketParticipant
0..1	Bid	0..*	Bid	inherited from: MarketParticipant
0..*	TimeSeries	0..*	TimeSeries	inherited from: MarketParticipant
0..*	MarketRole	0..*	MarketRole	inherited from: MarketParticipant
0..*	ParentOrganisation	0..1	ParentOrganization	inherited from: Organisation
0..1	Roles	0..*	OrganisationRole	inherited from: Organisation
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.67 SchedulingCoordinatorUser root class

Describing users of a Scheduling Coordinator.

Table 634 shows all attributes of SchedulingCoordinatorUser.

Table 634 – Attributes of ReferenceData::SchedulingCoordinatorUser

name	mult	type	description
loginID	0..1	String	Login ID
loginRole	0..1	String	Assigned roles (these are roles with either Read or Read/Write privileges on different Market Systems)

6.5.9.68 SchedulingPoint

Connection to other organizations at the boundary of the ISO/RTO.

Table 635 shows all attributes of SchedulingPoint.

Table 635 – Attributes of ReferenceData::SchedulingPoint

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 636 shows all association ends of SchedulingPoint with other classes.

Table 636 – Association ends of ReferenceData::SchedulingPoint with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..*	RegisteredResource	
0..1	InterchangeSchedule	0..*	InterchangeSchedule	
0..*	Flowgate	0..1	Flowgate	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.69 StartUpEnergyCurve

The energy consumption of a generating resource to complete a start-up from the StartUpEnergyCurve. Definition of the StartUpEnergyCurve includes, xvalue as the cooling time and y1value as the MW value.

Table 637 shows all attributes of StartUpEnergyCurve.

Table 637 – Attributes of ReferenceData::StartUpEnergyCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 638 shows all association ends of StartUpEnergyCurve with other classes.

Table 638 – Association ends of ReferenceData::StartUpEnergyCurve with other classes

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..1	RegisteredGenerator	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.70 StartUpFuelCurve

The fuel consumption of a Generating Resource to complete a Start-Up.(x=cooling time) Form Startup Fuel Curve. xAxisData -> cooling time, y1AxisData -> MBtu.

Table 639 shows all attributes of StartUpFuelCurve.

Table 639 – Attributes of ReferenceData::StartUpFuelCurve

name	mult	type	description
curveStyle	0..1	CurveStyle	inherited from: Curve
xMultiplier	0..1	UnitMultiplier	inherited from: Curve
xUnit	0..1	UnitSymbol	inherited from: Curve
y1Multiplier	0..1	UnitMultiplier	inherited from: Curve
y1Unit	0..1	UnitSymbol	inherited from: Curve
y2Multiplier	0..1	UnitMultiplier	inherited from: Curve
y2Unit	0..1	UnitSymbol	inherited from: Curve
y3Multiplier	0..1	UnitMultiplier	inherited from: Curve
y3Unit	0..1	UnitSymbol	inherited from: Curve
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 640 shows all association ends of StartUpFuelCurve with other classes.

Table 640 – Association ends of ReferenceData::StartUpFuelCurve with other classes

mult from	name	mult to	type	description
0..1	RegisteredGenerator	0..1	RegisteredGenerator	
1..1	CurveDatas	0..*	CurveData	inherited from: Curve
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.71 SubControlArea

An area defined for the purpose of tracking interchange with surrounding areas via tie points; may or may not serve as a control area.

Table 641 shows all attributes of SubControlArea.

Table 641 – Attributes of ReferenceData::SubControlArea

name	mult	type	description
areaShortName	0..1	String	Market area short name, which is the regulation zone. It references AGC regulation zone name.
constantCoefficient	0..1	Float	Loss estimate constant coefficient
embeddedControlArea	0..1	YesNo	Used in conjunction with the InternalCA flag. If the InternalCA flag is YES, this flag does not apply. If the InternalCA flag is NO, this flag provides an indication of AdjacentCA (NO) or Embedded CA (YES).
internalCA	0..1	YesNo	A Yes/No indication that this control area is contained internal to the system.

name	mult	type	description
linearCoefficient	0..1	Float	Loss estimate linear coefficient
localCA	0..1	YesNo	Indication that this control area is the local control area.
maxSelfSchedMW	0..1	Float	Maximum amount of self schedule MWs allowed for an embedded control area.
minSelfSchedMW	0..1	Float	Minimum amount of self schedule MW allowed for an embedded control area.
quadraticCoefficient	0..1	Float	Loss estimate quadratic coefficient
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 642 shows all association ends of SubControlArea with other classes.

Table 642 – Association ends of ReferenceData::SubControlArea with other classes

mult from	name	mult to	type	description
1..1	Export_EnergyTransactions	0..*	EnergyTransaction	Energy is transferred between interchange areas
1..1	Import_EnergyTransactions	0..*	EnergyTransaction	Energy is transferred between interchange areas
0..1	GeneralClearingResults	0..*	GeneralClearingResults	
0..1	BidSelfSched	0..*	BidSelfSched	
0..*	RegisteredResource	0..*	RegisteredResource	
0..1	ExPostLossResults	0..*	ExPostLossResults	
0..1	LossClearingResults	1..*	LossClearingResults	
0..*	AdjacentCaset	0..1	AdjacentCaset	
0..*	AggregateNode	0..*	AggregateNode	
0..1	CnodeDistributionFactor	0..*	CnodeDistributionFactor	
0..*	ControlAreaDesignation	0..*	ControlAreaDesignation	
0..1	To_Flowgate	0..*	Flowgate	
0..1	From_Flowgate	0..*	Flowgate	
0..*	HostControlArea	1..1	HostControlArea	The interchange area may operate as a control area
0..1	Pnode	0..*	Pnode	
0..*	RTO	1..1	RTO	
0..*	PSRType	0..1	PSRType	inherited from: PowerSystemResource
0..1	Controls	0..*	Control	inherited from: PowerSystemResource
0..1	Measurements	0..*	Measurement	inherited from: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	inherited from: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	inherited from: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.72 SubstitutionResourceList root class

List of resources that can be substituted for within the bounds of a Contract definition. This class has a precedence and a resource.

Table 643 shows all attributes of SubstitutionResourceList.

Table 643 – Attributes of ReferenceData::SubstitutionResourceList

name	mult	type	description
precedence	0..1	Integer	An indicator of the order a resource should be substituted. The lower the number the higher the precedence.

Table 644 shows all association ends of SubstitutionResourceList with other classes.

Table 644 – Association ends of ReferenceData::SubstitutionResourceList with other classes

mult from	name	mult to	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
0..*	TransmissionContractRight	0..1	ContractRight	

6.5.9.73 TACArea

Transmission Access Charge Area. Charges assessed, on behalf of the Participating Transmission Owner, to parties who require access to the controlled grid.

Table 645 shows all attributes of TACArea.

Table 645 – Attributes of ReferenceData::TACArea

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 646 shows all association ends of TACArea with other classes.

Table 646 – Association ends of ReferenceData::TACArea with other classes

mult from	name	mult to	type	description
0..1	AreaLoadCurve	0..*	AreaLoadCurve	
0..*	AggregatedPnode	0..*	AggregatedPnode	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.74 TransmissionRightChain

Allows chaining of TransmissionContractRights. Many individual contract rights can be included in the definition of a TransmissionRightChain. A TransmissionRightChain is also defined as a TransmissionContractRight itself.

Table 647 shows all attributes of TransmissionRightChain.

Table 647 – Attributes of ReferenceData::TransmissionRightChain

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 648 shows all association ends of TransmissionRightChain with other classes.

Table 648 – Association ends of ReferenceData::TransmissionRightChain with other classes

mult from	name	mult to	type	description
0..1	Ind_ContractRight	1..*	ContractRight	
0..1	Chain_ContractRight	1..1	ContractRight	
0..*	RTO	1..1	RTO	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.5.9.75 WheelingCounterParty

Counter party in a wheeling transaction.

Table 649 shows all attributes of WheelingCounterParty.

Table 649 – Attributes of ReferenceData::WheelingCounterParty

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 650 shows all association ends of WheelingCounterParty with other classes.

**Table 650 – Association ends of ReferenceData::
WheelingCounterParty with other classes**

mult from	name	mult to	type	description
0..*	RegisteredInterTie	0..*	RegisteredInterTie	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6 Package Environmental

6.6.1 General

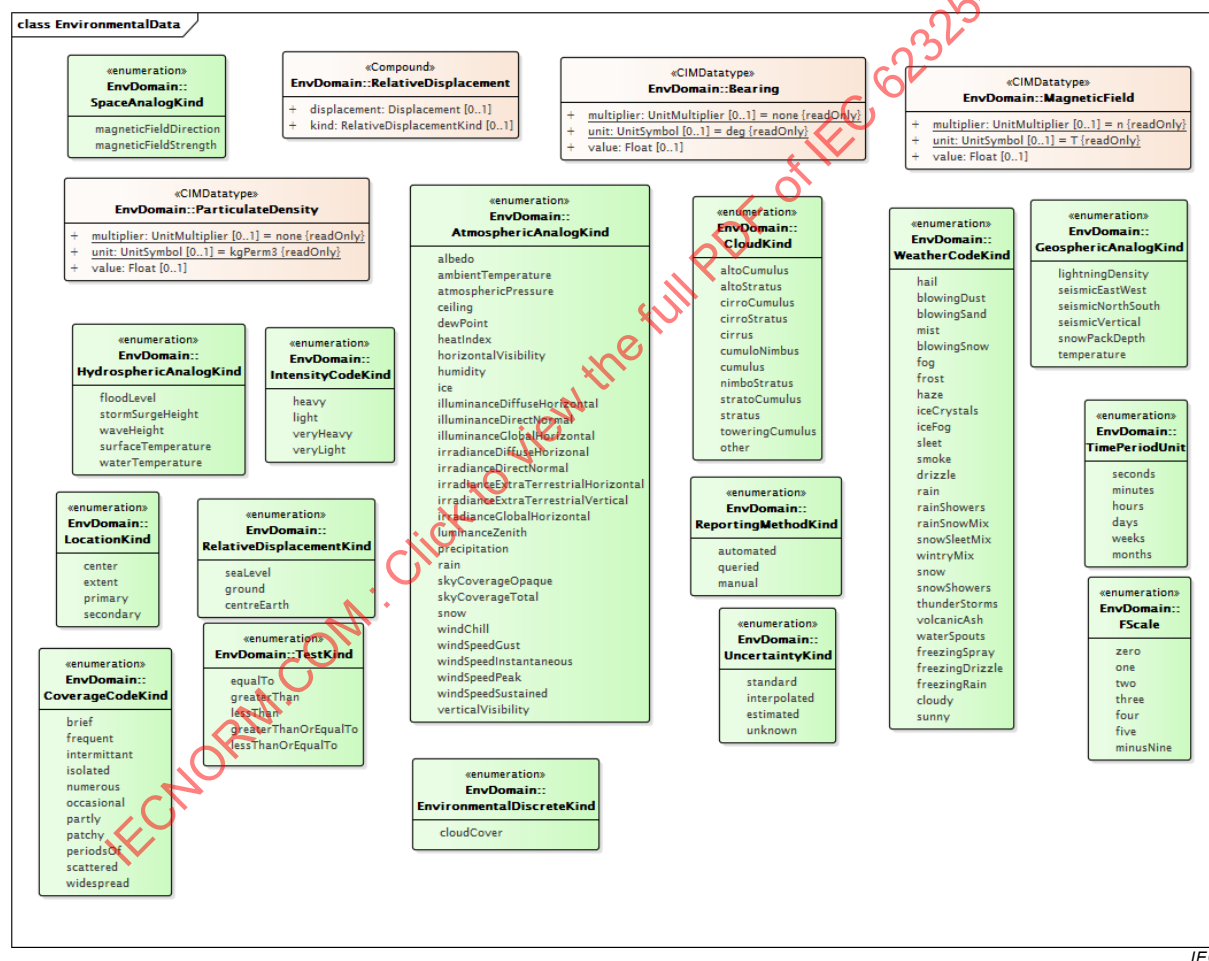


Figure 70 – Class diagram Environmental::EnvironmentalData

Figure 70: Illustrates the data types and enumerations which support the Environmental package classes in addition to the data types and enumerations which are contained within the IEC 61970, IEC 61968 and IEC 62325 packages.



71: Shows the Environmental package, which contains a model of constructs typically to describe environmental (weather) conditions including forecasts, observations, measurements, phenomena, and alerts.

Foundational classes are Observation, Forecast and EnvironmentalAlert and EnvironmentalEvent. The remaining classes describe the content of information of the foundational classes.

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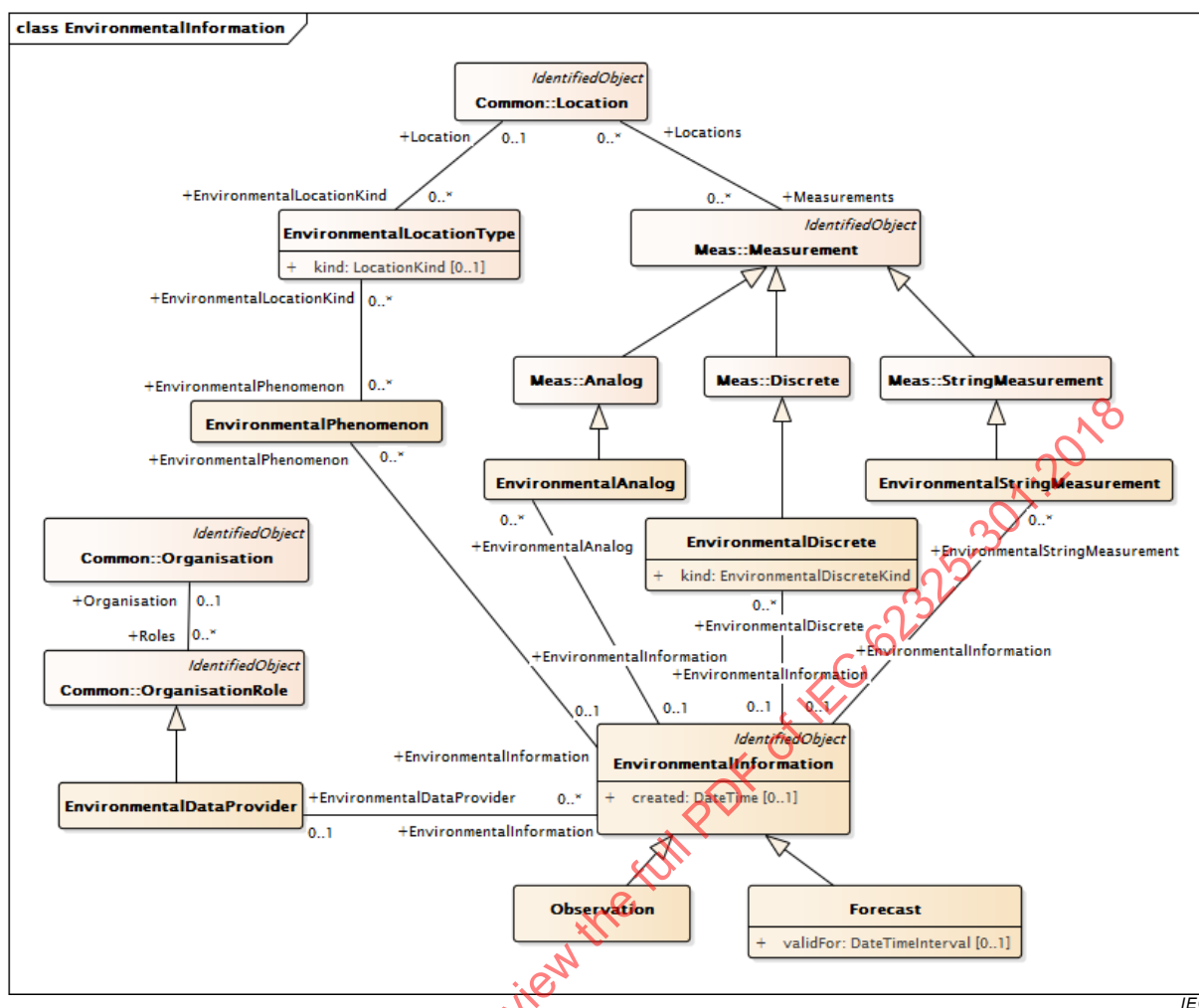
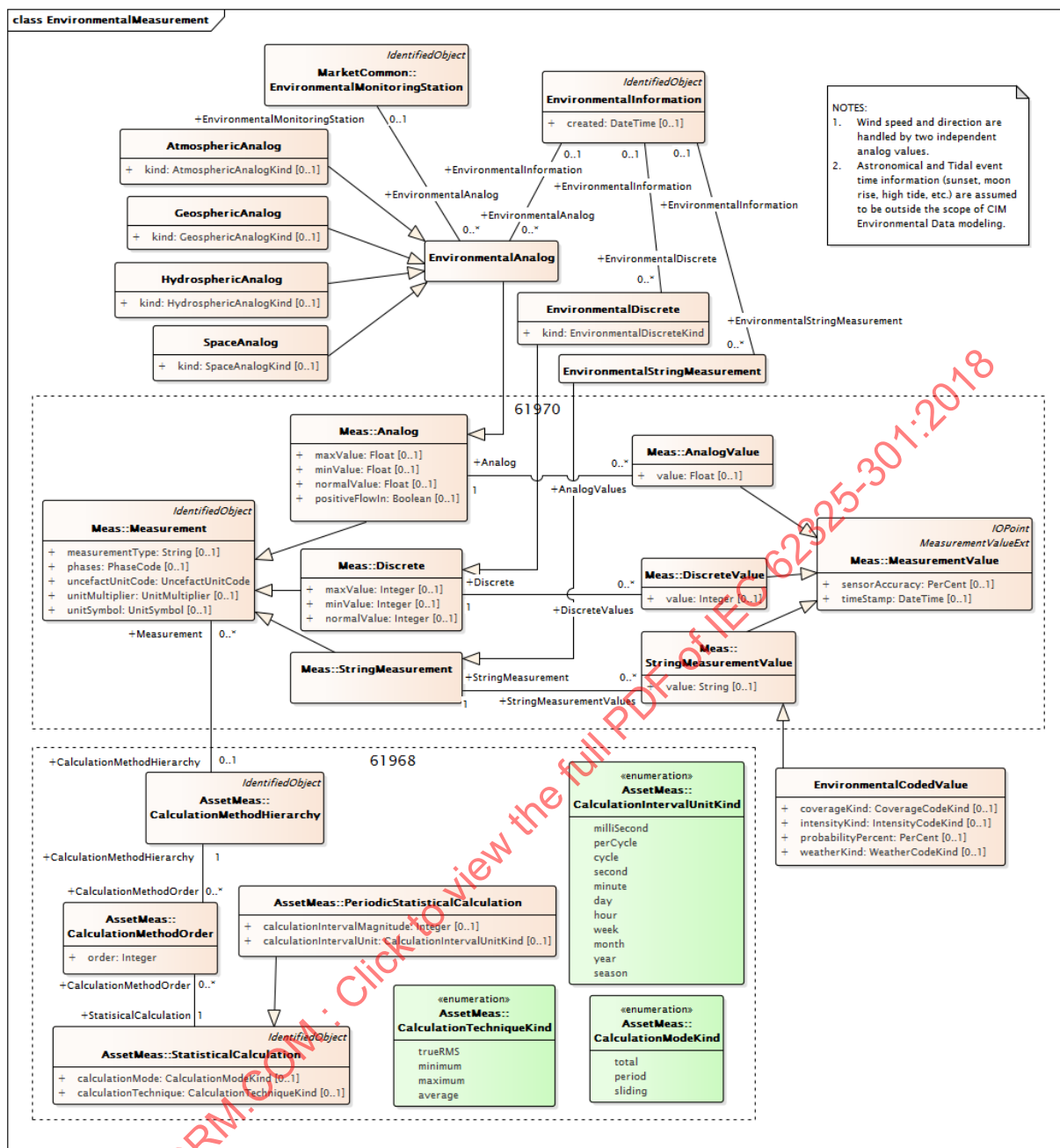
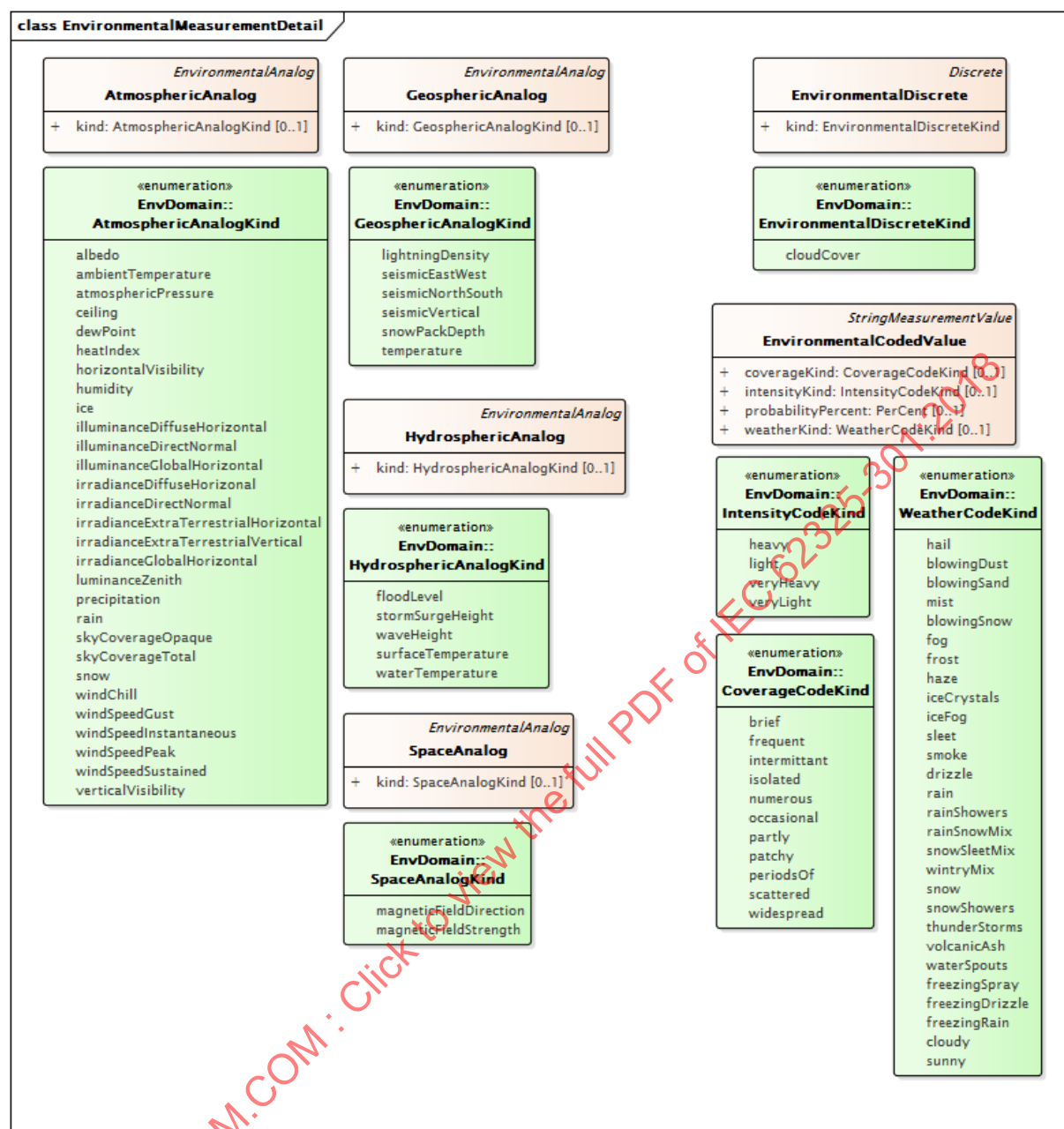


Figure 72 – Class diagram Environmental::EnvironmentalInformation

Figure 72: Shows Observation and Forecast, which are the two child classes of EnvironmentalInformation. Each has environmental data associated with it which is described in terms of measurements and phenomenon. Locational information for observations and forecasts is provided at the measurement or phenomenon level, not the observation or forecast level. Both observations and forecasts can have a data provider defined for them.





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Figure 74 – Class diagram Environmental::EnvironmentalMeasurementDetail

Figure 74. Shows the child classes of EnvironmentalAnalog, each of which has an enumerated kind attribute whose values reflect what is being measured by the float value in that domain (atmospheric, geospheric, hydrospheric or space).

The EnvironmentalDiscrete class has an enumerated .kind attribute whose value reflects what is being measured by the integer value.

The EnvironmentalCodedValue class (a child of StringMeasurementValue) has additional string values which allow a clear description of weather conditions, like 'heavy isolated thunderstorms'.

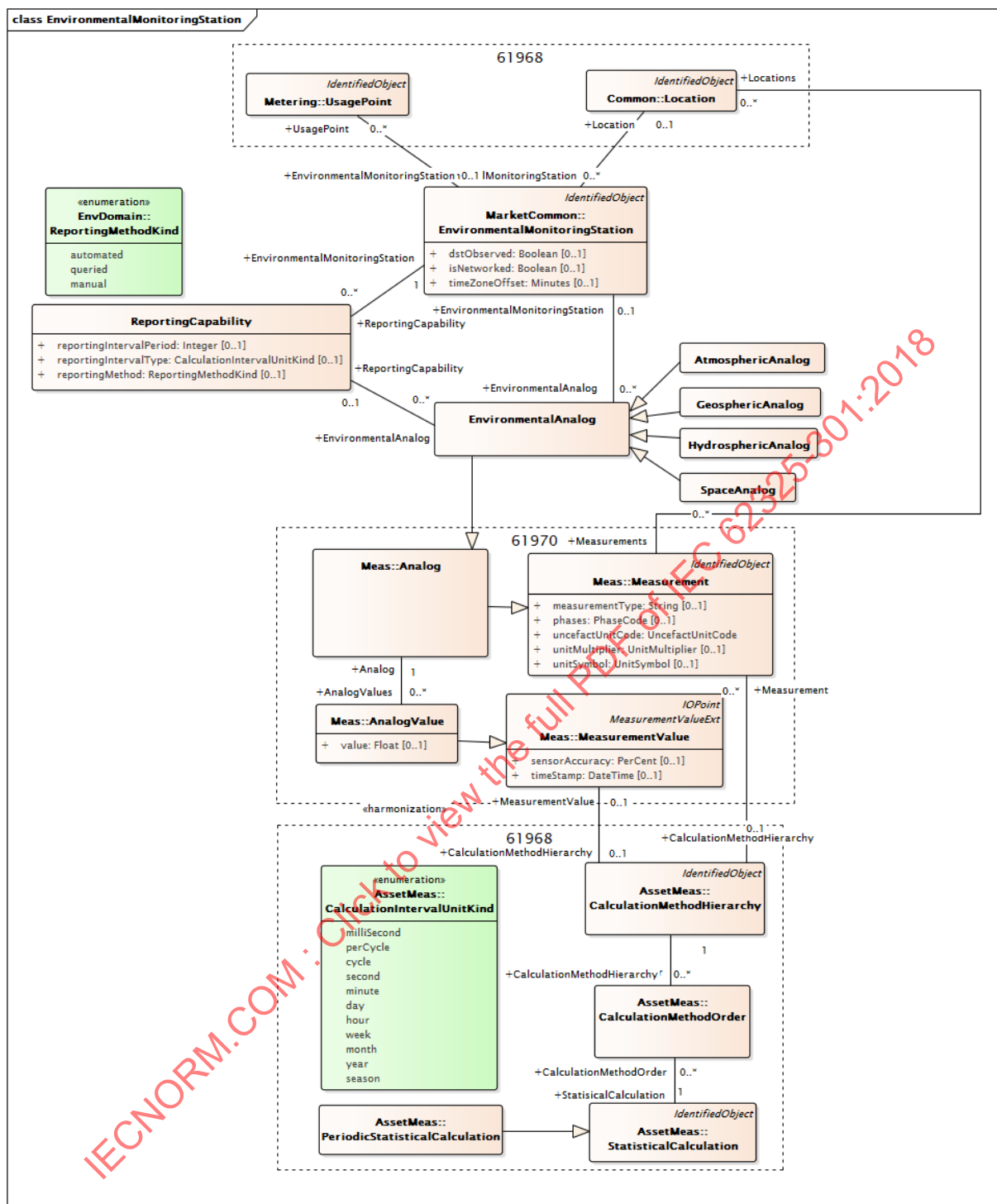


Figure 75 – Class diagram Environmental::EnvironmentalMonitoringStation

Figure 75: Shows environmental monitoring stations, which provide analog values for observations, which can be utility-owned or owned by an outside entity. Their capabilities can be defined by the ReportingCapability class. The ReportingCapability class utilizes EnvironmentalAnalog child classes to specifically describe the analogs the monitoring station can return. The possibility that a monitoring station could be associated with a meter or customer is addressed by an association between EnvironmentalMonitoringStation and UsagePoint.

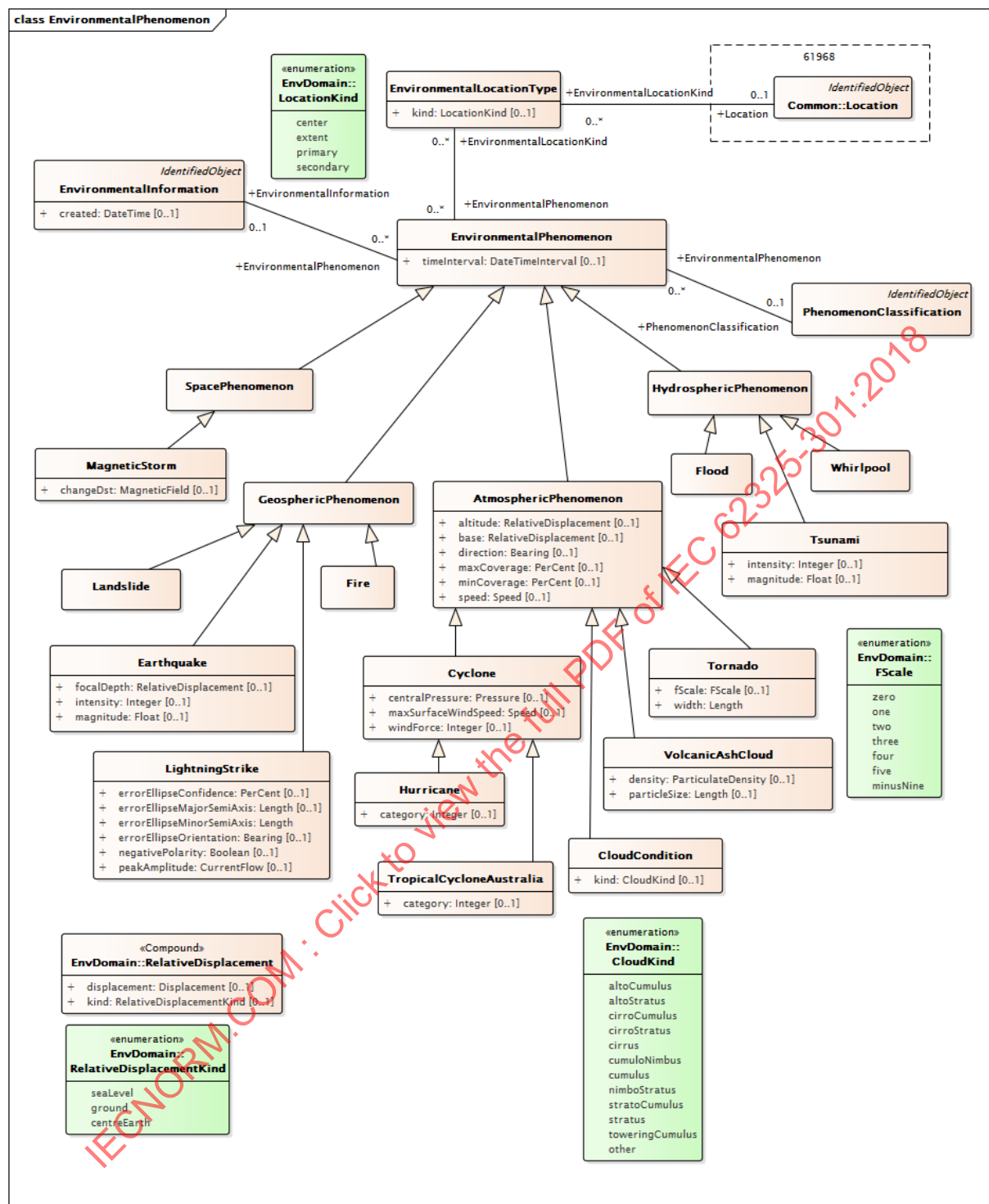
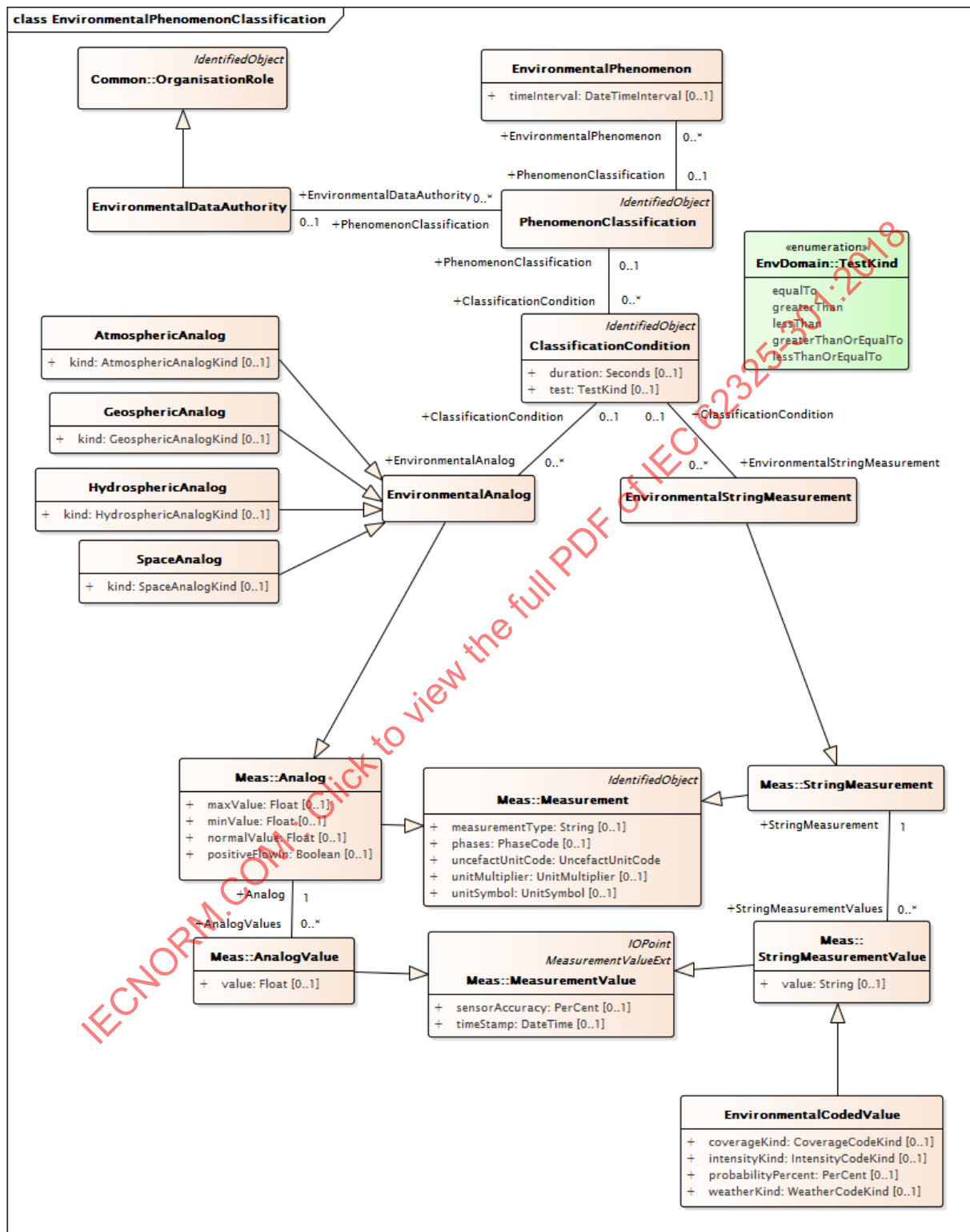


Figure 76 – Class diagram Environmental::EnvironmentalPhenomenon

Figure 76: Shows the EnvironmentalPhenomenon class and the specialized types of phenomenon classes. Environmental phenomena, like hurricanes, tornados, grass fires, floods, or geo-magnetic space storms are described by the Phenomenon class and its children, which are subclassed using the same regional groupings used for analogs (atmospheric, geospheric, hydrospheric, and space). Each EnvironmentalPhenomenon child class has attributes which reflect common information used to describe the nature or severity of that particular sort of phenomenon.

The location of phenomena are often described by both a center and extent, and this is supported by means of the EnvironmentalLocationKind class.

Major events, like hurricane Katrina or the 2008 Sichuan earthquake, can be described through time using multiple instances of a Phenomenon child class associated with an observation related to a 'named' event.

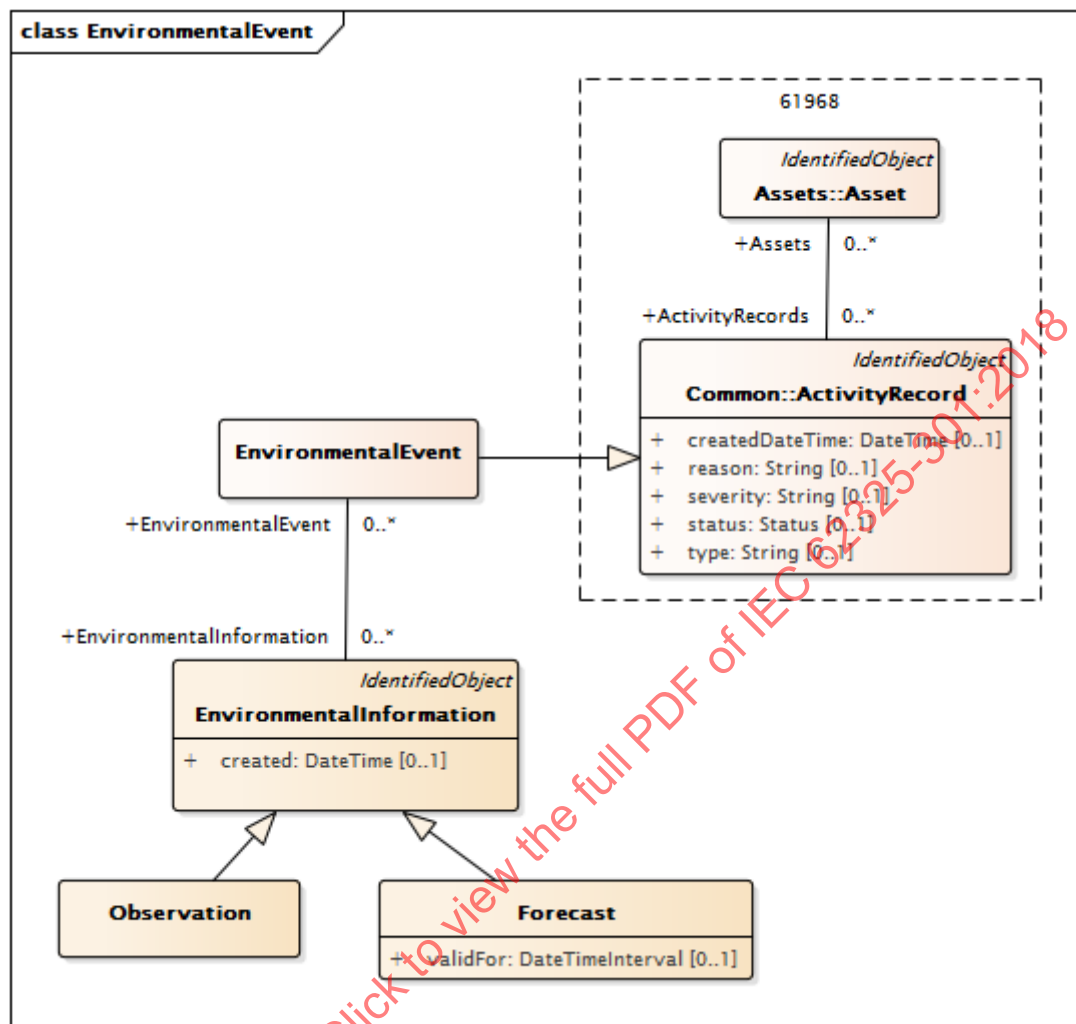


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Figure 77 – Class diagram Environmental::EnvironmentalPhenomenonClassification

Figure 77: Shows the PhenomenonClassification class and associated classes which support the classification of phenomenon severity. This allows an environmental data authority (for example a weather service or utility) to define threshold levels of conditions for phenomenon classification. The threshold levels are described by means of the measurement and

measurement value child classes (which provide a value) in combination with a test (equal to, above, below, etc.) and a duration.



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Figure 78 – Class diagram Environmental::EnvironmentalEvent

Figure 78: Shows the EnvironmentalEvent class as associated classes. Environmental events are occurrences to which one or more forecasts or observations may be tied and which may relate to or affect one or more assets. An event can be a 'named' occurrence like the 2011 Tohoku earthquake which could have multiple sets of associated observations or forecasts. Or an event could be simply a set of observations or forecasts that apply to an asset or set of assets.

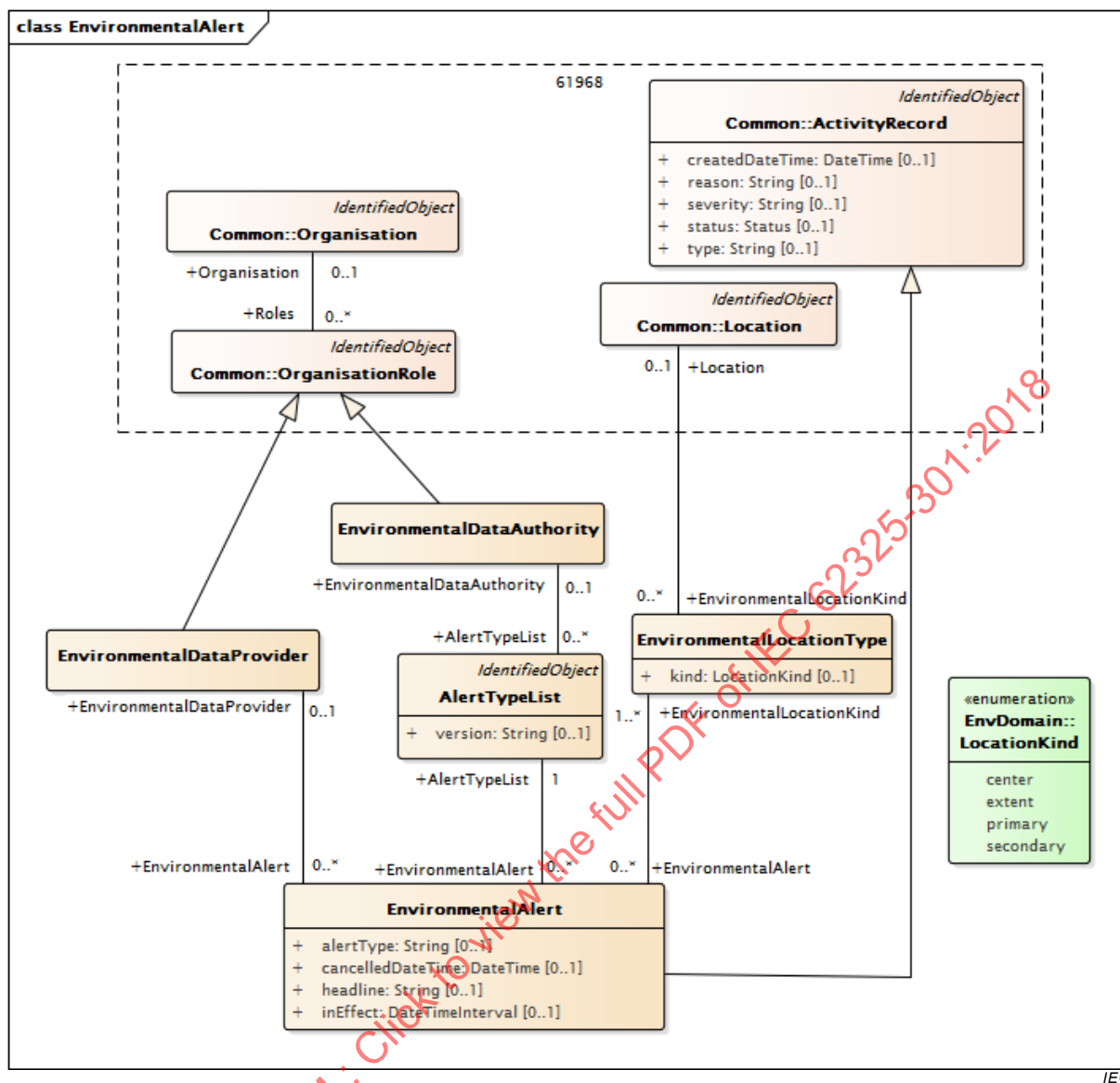


Figure 79 – Class diagram Environmental::EnvironmentalAlert

Figure 79: Shows EnvironmentalAlerts and associated classes. Environmental alerts, like tornado watches and warnings, are described by the EnvironmentalAlert class, which supports the definition of alert provider, alerting authority, and alert location. Alerting authorities (like the US National Weather Service) periodically update the types and definitions of alerts they can issue and the AlertTypeList class allows the specification of which version of alert definitions is being used. Some alerts have primary and secondary locations to which they apply and the EnvironmentalLocationKind class allows this distinction to be made.

6.6.2 AlertTypeList

A named list of alert types.

NOTE The name of the list is reflected in the .name attribute (inherited from IdentifiedObject).

Table 651 shows all attributes of AlertTypeList.

Table 651 – Attributes of Environmental::AlertTypeList

name	mult	type	description
version	0..1	String	The version of the named list of alert types.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 652 shows all association ends of AlertTypeList with other classes.

Table 652 – Association ends of Environmental::AlertTypeList with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalDataAuthority	0..1	EnvironmentalDataAuthority	The environmental data authority responsible for publishing this list of alert types.
1..1	EnvironmentalAlert	0..*	EnvironmentalAlert	An alert whose type is drawn from this alert type list.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.3 AtmosphericAnalog

Analog (float) measuring an atmospheric condition.

Table 653 shows all attributes of AtmosphericAnalog.

Table 653 – Attributes of Environmental::AtmosphericAnalog

name	mult	type	description
kind	0..1	AtmosphericAnalogKind	Kind of atmospheric analog.
maxValue	0..1	Float	inherited from: Analog
minValue	0..1	Float	inherited from: Analog
normalValue	0..1	Float	inherited from: Analog
positiveFlowIn	0..1	Boolean	inherited from: Analog
measurementType	0..1	String	inherited from: Measurement
phases	0..1	PhaseCode	inherited from: Measurement
uncefactUnitCode	1..1	UncefactUnitCode	inherited from: Measurement
unitMultiplier	0..1	UnitMultiplier	inherited from: Measurement
unitSymbol	0..1	UnitSymbol	inherited from: Measurement
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 654 shows all association ends of AtmosphericAnalog with other classes.

Table 654 – Association ends of Environmental::AtmosphericAnalog with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalMonitoringStation	0..1	EnvironmentalMonitoringStation	inherited from: EnvironmentalAnalog
0..*	ClassificationCondition	0..1	ClassificationCondition	inherited from: EnvironmentalAnalog
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalAnalog
0..*	ReportingCapability	0..1	ReportingCapability	inherited from: EnvironmentalAnalog
1..1	AnalogValues	0..*	AnalogValue	inherited from: Analog
0..*	LimitSets	0..*	AnalogLimitSet	inherited from: Analog
0..*	Terminal	0..1	ACDCTerminal	inherited from: Measurement
0..*	PowerSystemResource	0..1	PowerSystemResource	inherited from: Measurement
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.4 AtmosphericPhenomenon

An atmospheric phenomenon with a base and altitude providing the vertical coverage (combined with the Location to provide three dimensional space).

Table 655 shows all attributes of AtmosphericPhenomenon.

Table 655 – Attributes of Environmental::AtmosphericPhenomenon

name	mult	type	description
altitude	0..1	RelativeDisplacement	The maximum altitude of the phenomenon.
base	0..1	RelativeDisplacement	The base altitude of the phenomenon.
direction	0..1	Bearing	The direction the phenomenon is moving.
maxCoverage	0..1	PerCent	The maximum percentage coverage
minCoverage	0..1	PerCent	The minimum percentage coverage
speed	0..1	Speed	The speed of the phenomenon
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 656 shows all association ends of AtmosphericPhenomenon with other classes.

Table 656 – Association ends of Environmental::AtmosphericPhenomenon with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.5 ClassificationCondition

A classification condition used to define preconditions that must be met by a phenomena classification.

Table 657 shows all attributes of ClassificationCondition.

Table 657 – Attributes of Environmental::ClassificationCondition

name	mult	type	description
duration	0..1	Seconds	The duration of the of the condition in seconds
test	0..1	TestKind	The test applied to the value.
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 658 shows all association ends of ClassificationCondition with other classes.

Table 658 – Association ends of Environmental::ClassificationCondition with other classes

mult from	name	mult to	type	description
0..*	PhenomenonClassification	0..1	PhenomenonClassification	Phenomenon classification to which this condition relates.
0..1	EnvironmentalStringMeasurement	0..*	EnvironmentalStringMeasurement	String measurement which contributes to the definition of this classification condition.
0..1	EnvironmentalAnalog	0..*	EnvironmentalAnalog	Analog which contributes to the definition of this classification condition.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.6 CloudCondition

A classified cloud phenomenon with a type.

Table 659 shows all attributes of CloudCondition.

Table 659 – Attributes of Environmental::CloudCondition

name	mult	type	description
kind	0..1	CloudKind	The type of the cloud as defined by the CloudKind enumeration.
altitude	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
base	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
direction	0..1	Bearing	inherited from: AtmosphericPhenomenon
maxCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon

name	mult	type	description
minCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon
speed	0..1	Speed	inherited from: AtmosphericPhenomenon
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 660 shows all association ends of CloudCondition with other classes.

Table 660 – Association ends of Environmental::CloudCondition with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.7 Cyclone

A cyclone (or tropical cyclone), a rapidly-rotating storm system characterized by a low-pressure center, strong winds, and a spiral arrangement of thunderstorms that produce heavy rain.

Table 661 shows all attributes of Cyclone.

Table 661 – Attributes of Environmental::Cyclone

name	mult	type	description
centralPressure	0..1	Pressure	The central pressure of the cyclone during the time interval.
maxSurfaceWindSpeed	0..1	Speed	The maximum surface wind speed of the cyclone during the time interval.
windForce	0..1	Integer	Wind Force as classified on the Beaufort Scale (0-12) during the time interval.
altitude	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
base	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
direction	0..1	Bearing	inherited from: AtmosphericPhenomenon
maxCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon
minCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon
speed	0..1	Speed	inherited from: AtmosphericPhenomenon
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 662 shows all association ends of Cyclone with other classes.

Table 662 – Association ends of Environmental::Cyclone with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.8 Earthquake

An earthquake.

Table 663 shows all attributes of Earthquake.

Table 663 – Attributes of Environmental::Earthquake

name	mult	type	description
focalDepth	0..1	RelativeDisplacement	The depth below the earth's surface of the earthquake's focal point.
intensity	0..1	Integer	The intensity of the earthquake as defined by the Modified Mercalli Intensity (MMI) scale. Possible values are 1-12, corresponding to I-XII.
magnitude	0..1	Float	The magnitude of the earthquake as defined on the Moment Magnitude (Mw) scale, which measures the size of earthquakes in terms of the energy released. Must be greater than zero.
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 664 shows all association ends of Earthquake with other classes.

Table 664 – Association ends of Environmental::Earthquake with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.9 EnvironmentalAnalog

Analog (float) measurement of relevance in the environmental domain.

Table 665 shows all attributes of EnvironmentalAnalog.

Table 665 – Attributes of Environmental::EnvironmentalAnalog

name	mult	type	description
maxValue	0..1	Float	inherited from: Analog
minValue	0..1	Float	inherited from: Analog
normalValue	0..1	Float	inherited from: Analog
positiveFlowIn	0..1	Boolean	inherited from: Analog
measurementType	0..1	String	inherited from: Measurement
phases	0..1	PhaseCode	inherited from: Measurement
uncefactUnitCode	1..1	UncefactUnitCode	inherited from: Measurement
unitMultiplier	0..1	UnitMultiplier	inherited from: Measurement
unitSymbol	0..1	UnitSymbol	inherited from: Measurement
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 666 shows all association ends of EnvironmentalAnalog with other classes.

Table 666 – Association ends of Environmental::EnvironmentalAnalog with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalMonitoring Station	0..1	EnvironmentalMonitoring Station	Monitoring station which provides this environmental analog measurement.
0..*	ClassificationCondition	0..1	ClassificationCondition	Classification condition which this analog helps define.
0..*	EnvironmentalInformatio n	0..1	EnvironmentalInformatio n	Observation or forecast with which this environmental analog measurement is associated.
0..*	ReportingCapability	0..1	ReportingCapability	The reporting capability this environmental value set helps define.
1..1	AnalogValues	0..*	AnalogValue	inherited from: Analog
0..*	LimitSets	0..*	AnalogLimitSet	inherited from: Analog
0..*	Terminal	0..1	ACDCTerminal	inherited from: Measurement
0..*	PowerSystemResource	0..1	PowerSystemResource	inherited from: Measurement
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObjec t	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.10 EnvironmentalAlert

An environmental alert issued by a provider or system.

Table 667 shows all attributes of EnvironmentalAlert.

Table 667 – Attributes of Environmental::EnvironmentalAlert

name	mult	type	description
alertType	0..1	String	The type of the issued alert which is drawn from the specified alert type list.
cancelledDateTime	0..1	DateTime	Time and date alert cancelled. Used only if alert is cancelled before it expires.
headline	0..1	String	An abbreviated textual description of the alert issued. Note: the full text of the alert appears in the .description attribute (inherited from IdentifiedObject).
inEffect	0..1	DateTimeInterval	The interval for which this weather alert is in effect.
createdDateTime	0..1	DateTime	inherited from: ActivityRecord
type	0..1	String	inherited from: ActivityRecord
severity	0..1	String	inherited from: ActivityRecord
reason	0..1	String	inherited from: ActivityRecord
status	0..1	Status	inherited from: ActivityRecord
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 668 shows all association ends of EnvironmentalAlert with other classes.

Table 668 – Association ends of Environmental::EnvironmentalAlert with other classes

mult from	name	mult to	type	description
0..*	AlertTypeList	1..1	AlertTypeList	The list of alert types from which the type of this alert is drawn.
0..*	EnvironmentalDataProvider	0..1	EnvironmentalDataProvider	Environmental data provider for this alert.
0..*	EnvironmentalLocationKind	1..*	EnvironmentalLocationType	Type of location to which this environmental alert applies.
0..*	Assets	0..*	Asset	inherited from: ActivityRecord
0..*	Author	0..1	Author	inherited from: ActivityRecord
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.11 EnvironmentalCodedValue

An environmental value described using a coded value. A triplicate of enumerated values representing intensity, coverage, type of weather is used. These may be concatenated into the string value.

Table 669 shows all attributes of EnvironmentalCodedValue.

Table 669 – Attributes of Environmental::EnvironmentalCodedValue

name	mult	type	description
coverageKind	0..1	CoverageCodeKind	Code representing the coverage of the weather condition.
intensityKind	0..1	IntensityCodeKind	Code representing the intensity of the weather condition.
probabilityPercent	0..1	PerCent	Probability of weather condition occurring during the time interval expressed as a percentage. Applicable only when weather condition is related to a forecast (not an observation).
weatherKind	0..1	WeatherCodeKind	Code representing the type of weather condition.
value	0..1	String	inherited from: StringMeasurementValue
timeStamp	0..1	DateTime	inherited from: MeasurementValue
sensorAccuracy	0..1	PerCent	inherited from: MeasurementValue
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 670 shows all association ends of EnvironmentalCodedValue with other classes.

Table 670 – Association ends of Environmental::EnvironmentalCodedValue with other classes

mult from	name	mult to	type	description
0..*	StringMeasurement	1..1	StringMeasurement	inherited from: StringMeasurementValue
1..1	RemoteSource	0..1	RemoteSource	inherited from: MeasurementValue
1..1	MeasurementValueQuality	0..1	MeasurementValueQuality	inherited from: MeasurementValue
0..*	MeasurementValueSource	1..1	MeasurementValueSource	inherited from: MeasurementValue
0..1	BilateralToIOPoint	0..*	ProvidedBilateralPoint	inherited from: IOPoint
0..*	IOPointSource	0..1	IOPointSource	inherited from: IOPoint
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.12 EnvironmentalDataAuthority

An entity defining classifications or categories of environmental information, like phenomena or alerts.

Table 671 shows all attributes of EnvironmentalDataAuthority.

Table 671 – Attributes of Environmental::EnvironmentalDataAuthority

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 672 shows all association ends of EnvironmentalDataAuthority with other classes.

Table 672 – Association ends of Environmental::EnvironmentalDataAuthority with other classes

mult from	name	mult to	type	description
0..1	AlertTypeList	0..*	AlertTypeList	A specific version of a list of alerts published by this environmental data authority.
0..1	PhenomenonClassification	0..*	PhenomenonClassification	Phenomenon classification defined by this environmental data authority.
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: OrganisationRole
0..*	Organisation	0..1	Organisation	inherited from: OrganisationRole
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.13 EnvironmentalDataProvider

Entity providing environmental data. Could be an observed weather data provider, an entity providing forecasts, an authority providing alerts, etc.

Table 673 shows all attributes of EnvironmentalDataProvider.

Table 673 – Attributes of Environmental::EnvironmentalDataProvider

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 674 shows all association ends of EnvironmentalDataProvider with other classes.

Table 674 – Association ends of Environmental::EnvironmentalDataProvider with other classes

mult from	name	mult to	type	description
0..1	EnvironmentalAlert	0..*	EnvironmentalAlert	Alert issued by this environmental data provider.
0..1	EnvironmentalInformation	0..*	EnvironmentalInformation	Environmental information provided by this environmental data provider.
0..1	ConfigurationEvents	0..*	ConfigurationEvent	inherited from: OrganisationRole
0..*	Organisation	0..1	Organisation	inherited from: OrganisationRole
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.14 EnvironmentalDiscrete

Discrete (integer) measurement of relevance in the environmental domain.

Table 675 shows all attributes of EnvironmentalDiscrete.

Table 675 – Attributes of Environmental::EnvironmentalDiscrete

name	mult	type	description
kind	1..1	EnvironmentalDiscreteKind	Kind of environmental discrete (integer).
maxValue	0..1	Integer	inherited from: Discrete
minValue	0..1	Integer	inherited from: Discrete
normalValue	0..1	Integer	inherited from: Discrete
measurementType	0..1	String	inherited from: Measurement
phases	0..1	PhaseCode	inherited from: Measurement
uncefactUnitCode	1..1	UncefactUnitCode	inherited from: Measurement
unitMultiplier	0..1	UnitMultiplier	inherited from: Measurement
unitSymbol	0..1	UnitSymbol	inherited from: Measurement
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 676 shows all association ends of EnvironmentalDiscrete with other classes.

Table 676 – Association ends of Environmental::EnvironmentalDiscrete with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	Observation or forecast with which this environmental discrete (integer) is associated.
1..1	DiscreteValues	0..*	DiscreteValue	inherited from: Discrete
0..*	ValueAliasSet	0..1	ValueAliasSet	inherited from: Discrete
0..*	Terminal	0..1	ACDCTerminal	inherited from: Measurement
0..*	PowerSystemResource	0..1	PowerSystemResource	inherited from: Measurement
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.15 EnvironmentalEvent

An environmental event to which one or more forecasts or observations may be tied and which may relate to or affect one or more assets.

This class is intended to be used as a means of grouping forecasts and/or observations and could be used for a variety of purposes, including:

- to define a 'named' event like Hurricane Katrina and allow the historic (or forecast) values for phenomena and measurements (precipitation, temperature) across time to be associated with it
- to identify assets that were (or are forecast to be) affected by a phenomenon or set of measurements

Table 677 shows all attributes of EnvironmentalEvent.

Table 677 – Attributes of Environmental::EnvironmentalEvent

name	mult	type	description
createdDateTime	0..1	DateTime	inherited from: ActivityRecord
type	0..1	String	inherited from: ActivityRecord
severity	0..1	String	inherited from: ActivityRecord
reason	0..1	String	inherited from: ActivityRecord
status	0..1	Status	inherited from: ActivityRecord
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 678 shows all association ends of EnvironmentalEvent with other classes.

Table 678 – Association ends of Environmental::EnvironmentalEvent with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..*	EnvironmentalInformation	Forecast or observation related to this environmental event.
0..*	Assets	0..*	Asset	inherited from: ActivityRecord
0..*	Author	0..1	Author	inherited from: ActivityRecord
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.16 EnvironmentalInformation

Abstract class (with concrete child classes of Observation and Forecast) that groups phenomenon and/or environmental value sets.

Table 679 shows all attributes of EnvironmentalInformation.

Table 679 – Attributes of Environmental::EnvironmentalInformation

name	mult	type	description
created	0..1	DateTime	The timestamp of when the forecast was created
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 680 shows all association ends of EnvironmentalInformation with other classes.

Table 680 – Association ends of Environmental::EnvironmentalInformation with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalDataProvider	0..1	EnvironmentalDataProvider	Environmental data provider supplying this environmental information.
0..1	EnvironmentalAnalog	0..*	EnvironmentalAnalog	Environmental analog associated with this observation or forecast.
0..1	EnvironmentalDiscrete	0..*	EnvironmentalDiscrete	Environmental discrete (integer) associated with this observation or forecast.
0..*	EnvironmentalEvent	0..*	EnvironmentalEvent	Environmental event to which this forecast or observation relates.
0..1	EnvironmentalPhenomenon	0..*	EnvironmentalPhenomenon	
0..1	EnvironmentalStringMeasurement	0..*	EnvironmentalStringMeasurement	Environmental string measurement associated with this forecast or observation.
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject

mult from	name	mult to	type	description
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.17 EnvironmentalLocationType root class

Type of environmental location. Used when an environmental alert or phenomenon has multiple locations associated with it.

Table 681 shows all attributes of EnvironmentalLocationType.

Table 681 – Attributes of Environmental::EnvironmentalLocationType

name	mult	type	description
kind	0..1	LocationKind	The kind of location. Typical values might be center, extent, primary, secondary, etc.

Table 682 shows all association ends of EnvironmentalLocationType with other classes.

Table 682 – Association ends of Environmental::EnvironmentalLocationType with other classes

mult from	name	mult to	type	description
0..*	Location	0..1	Location	Location of this instance of the kind of environmental location.
1..*	EnvironmentalAlert	0..*	EnvironmentalAlert	Environmental alert applying to location of this type.
0..*	EnvironmentalPhenomenon	0..*	EnvironmentalPhenomenon	Environmental phenomenon for which this location is of relevance.

6.6.18 EnvironmentalPhenomenon root class

The actual or forecast characteristics of an environmental phenomenon at a specific point in time (or during a specific time interval) that may have both a center and area/line location.

Table 683 shows all attributes of EnvironmentalPhenomenon.

Table 683 – Attributes of Environmental::EnvironmentalPhenomenon

name	mult	type	description
timeInterval	0..1	DateTimeInterval	The timestamp of the phenomenon as a single point or time interval.

Table 684 shows all association ends of EnvironmentalPhenomenon with other classes.

Table 684 – Association ends of Environmental::EnvironmentalPhenomenon with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	The forecast or observation of which this phenomenon description is a part.
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	Location of relevance to this environmental phenomenon.
0..*	PhenomenonClassification	0..1	PhenomenonClassification	The classification of this phenomenon.

6.6.19 EnvironmentalStringMeasurement

String measurement of relevance in the environmental domain.

Table 685 shows all attributes of EnvironmentalStringMeasurement.

Table 685 – Attributes of Environmental::EnvironmentalStringMeasurement

name	mult	type	description
measurementType	0..1	String	inherited from: Measurement
phases	0..1	PhaseCode	inherited from: Measurement
uncefactUnitCode	1..1	UncefactUnitCode	inherited from: Measurement
unitMultiplier	0..1	UnitMultiplier	inherited from: Measurement
unitSymbol	0..1	UnitSymbol	inherited from: Measurement
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 686 shows all association ends of EnvironmentalStringMeasurement with other classes.

Table 686 – Association ends of Environmental::EnvironmentalStringMeasurement with other classes

mult from	name	mult to	type	description
0..*	ClassificationCondition	0..1	ClassificationCondition	Classification condition which this string measurement helps define.
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	Observation or forecast with which this environmental string is associated.
1..1	StringMeasurementValues	0..*	StringMeasurementValue	inherited from: StringMeasurement
0..*	Terminal	0..1	ACDCTerminal	inherited from: Measurement
0..*	PowerSystemResource	0..1	PowerSystemResource	inherited from: Measurement
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.20 Fire

A fire, often uncontrolled, covering an area of land which typically contains combustible vegetation. Associated location information is assumed to describe the total area burned as of a specified time.

Table 687 shows all attributes of Fire.

Table 687 – Attributes of Environmental::Fire

name	mult	type	description
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 688 shows all association ends of Fire with other classes.

Table 688 – Association ends of Environmental::Fire with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.21 Flood

A flood, an overflowing of a large amount of water beyond its normal confines, esp. over what is normally dry land.

Table 689 shows all attributes of Flood.

Table 689 – Attributes of Environmental::Flood

name	mult	type	description
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 690 shows all association ends of Flood with other classes.

Table 690 – Association ends of Environmental::Flood with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.22 Forecast

A forecast group of value sets and/or phenomena characteristics.

Table 691 shows all attributes of Forecast.

Table 691 – Attributes of Environmental::Forecast

name	mult	type	description
validFor	0..1	DateTimeInterval	The interval for which the forecast is valid. For example, a forecast issued now for tomorrow might be valid for the next 2 hours.
created	0..1	DateTime	inherited from: EnvironmentalInformation
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 692 shows all association ends of Forecast with other classes.

Table 692 – Association ends of Environmental::Forecast with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalDataProvider	0..1	EnvironmentalDataProvider	inherited from: EnvironmentalInformation
0..1	EnvironmentalAnalog	0..*	EnvironmentalAnalog	inherited from: EnvironmentalInformation
0..1	EnvironmentalDiscrete	0..*	EnvironmentalDiscrete	inherited from: EnvironmentalInformation
0..*	EnvironmentalEvent	0..*	EnvironmentalEvent	inherited from: EnvironmentalInformation
0..1	EnvironmentalPhenomenon	0..*	EnvironmentalPhenomenon	inherited from: EnvironmentalInformation
0..1	EnvironmentalStringMeasurement	0..*	EnvironmentalStringMeasurement	inherited from: EnvironmentalInformation
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.23 GeosphericAnalog

Analog (float) measuring a geospheric condition.

Table 693 shows all attributes of GeosphericAnalog.

Table 693 – Attributes of Environmental::GeosphericAnalog

name	mult	type	description
kind	0..1	GeosphericAnalogKind	Kind of geospheric analog.
maxValue	0..1	Float	inherited from: Analog
minValue	0..1	Float	inherited from: Analog
normalValue	0..1	Float	inherited from: Analog
positiveFlowIn	0..1	Boolean	inherited from: Analog
measurementType	0..1	String	inherited from: Measurement
phases	0..1	PhaseCode	inherited from: Measurement
uncefactUnitCode	1..1	UncefactUnitCode	inherited from: Measurement
unitMultiplier	0..1	UnitMultiplier	inherited from: Measurement
unitSymbol	0..1	UnitSymbol	inherited from: Measurement
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 694 shows all association ends of GeosphericAnalog with other classes.

Table 694 – Association ends of Environmental::GeosphericAnalog with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalMonitoringStation	0..1	EnvironmentalMonitoringStation	inherited from: EnvironmentalAnalog
0..*	ClassificationCondition	0..1	ClassificationCondition	inherited from: EnvironmentalAnalog
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalAnalog
0..*	ReportingCapability	0..1	ReportingCapability	inherited from: EnvironmentalAnalog
1..1	AnalogValues	0..*	AnalogValue	inherited from: Analog
0..*	LimitSets	0..*	AnalogLimitSet	inherited from: Analog
0..*	Terminal	0..1	ACDCTerminal	inherited from: Measurement
0..*	PowerSystemResource	0..1	PowerSystemResource	inherited from: Measurement
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.24 GeosphericPhenomenon

A geospheric phenomenon.

Table 695 shows all attributes of GeosphericPhenomenon.

Table 695 – Attributes of Environmental::GeosphericPhenomenon

name	mult	type	description
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 696 shows all association ends of GeosphericPhenomenon with other classes.

Table 696 – Association ends of Environmental::GeosphericPhenomenon with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.25 Hurricane

A hurricane, a subtype of cyclone occurring in the North Atlantic Ocean or North-eastern Pacific Ocean whose intensity is measured using the Saffir-Simpson Hurricane Scale.

Table 697 shows all attributes of Hurricane.

Table 697 – Attributes of Environmental::Hurricane

name	mult	type	description
category	0..1	Integer	The hurricane's category during the time interval, using Saffir-Simpson Hurricane Wind Scale, a 1 to 5 rating based on a hurricane's sustained wind speed.
centralPressure	0..1	Pressure	inherited from: Cyclone
maxSurfaceWindSpeed	0..1	Speed	inherited from: Cyclone
windForce	0..1	Integer	inherited from: Cyclone
altitude	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
base	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
direction	0..1	Bearing	inherited from: AtmosphericPhenomenon
maxCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon
minCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon
speed	0..1	Speed	inherited from: AtmosphericPhenomenon
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 698 shows all association ends of Hurricane with other classes.

Table 698 – Association ends of Environmental::Hurricane with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.26 HydrosphericAnalog

Analog (float) measuring a hydrospheric condition.

Table 699 shows all attributes of HydrosphericAnalog.

Table 699 – Attributes of Environmental::HydrosphericAnalog

name	mult	type	description
kind	0..1	HydrosphericAnalogKind	Kind of hydrospheric analog.
maxValue	0..1	Float	inherited from: Analog
minValue	0..1	Float	inherited from: Analog
normalValue	0..1	Float	inherited from: Analog
positiveFlowIn	0..1	Boolean	inherited from: Analog
measurementType	0..1	String	inherited from: Measurement
phases	0..1	PhaseCode	inherited from: Measurement
uncefactUnitCode	1..1	UncefactUnitCode	inherited from: Measurement
unitMultiplier	0..1	UnitMultiplier	inherited from: Measurement
unitSymbol	0..1	UnitSymbol	inherited from: Measurement
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 700 shows all association ends of HydrosphericAnalog with other classes.

Table 700 – Association ends of Environmental::HydrosphericAnalog with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalMonitoringStation	0..1	EnvironmentalMonitoringStation	inherited from: EnvironmentalAnalog
0..*	ClassificationCondition	0..1	ClassificationCondition	inherited from: EnvironmentalAnalog
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalAnalog
0..*	ReportingCapability	0..1	ReportingCapability	inherited from: EnvironmentalAnalog
1..1	AnalogValues	0..*	AnalogValue	inherited from: Analog
0..*	LimitSets	0..*	AnalogLimitSet	inherited from: Analog
0..*	Terminal	0..1	ACDCTerminal	inherited from: Measurement

mult from	name	mult to	type	description
0..*	PowerSystemResource	0..1	PowerSystemResource	inherited from: Measurement
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.27 HydrosphericPhenomenon

A hydrospheric phenomenon.

Table 701 shows all attributes of HydrosphericPhenomenon.

Table 701 – Attributes of Environmental::HydrosphericPhenomenon

name	mult	type	description
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 702 shows all association ends of HydrosphericPhenomenon with other classes.

Table 702 – Association ends of Environmental::HydrosphericPhenomenon with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.28 Landslide

A landslide, a large mass of rocks and earth that suddenly and quickly moves down the side of a mountain or hill.

Table 703 shows all attributes of Landslide.

Table 703 – Attributes of Environmental::Landslide

name	mult	type	description
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 704 shows all association ends of Landslide with other classes.

Table 704 – Association ends of Environmental::Landslide with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.29 LightningStrike

A cloud-to-ground lightning strike at a particular location.

Table 705 shows all attributes of LightningStrike.

Table 705 – Attributes of Environmental::LightningStrike

name	mult	type	description
errorEllipseConfidence	0..1	PerCent	Likelihood that strike fell within errorEllipse.
errorEllipseMajorSemiAxis	0..1	Length	Length of major semi-axis (longest radius) of the error ellipse.
errorEllipseMinorSemiAxis	1..1	Length	Length of minor semi-axis (shortest radius) of the error ellipse.
errorEllipseOrientation	0..1	Bearing	The orientation of the major semi- axis in degrees from True North.
negativePolarity	0..1	Boolean	The polarity of the strike, with T meaning negative. About 90% of all lightning strokes are negative strokes, meaning that they were initiated by a large concentration of negative charge in the cloud-base; this tends to induce an area of positive charge on the ground.
peakAmplitude	0..1	CurrentFlow	Peak current of strike.
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 706 shows all association ends of LightningStrike with other classes.

Table 706 – Association ends of Environmental::LightningStrike with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.30 MagneticStorm

A magnetic storm, a temporary disturbance of the earth's magnetic field, induced by radiation and streams of charged particles from the sun.

Table 707 shows all attributes of MagneticStorm.

Table 707 – Attributes of Environmental::MagneticStorm

name	mult	type	description
changeDst	0..1	MagneticField	Change in the disturbance – storm time (Dst) index. The size of a geomagnetic storm is classified as: – moderate (-50 nT > minimum of Dst > -100 nT) – intense (-100 nT > minimum Dst > -250 nT) or – super-storm (minimum of Dst < -250 nT).
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 708 shows all association ends of MagneticStorm with other classes.

Table 708 – Association ends of Environmental::MagneticStorm with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.31 Observation

Observed (actual non-forecast) values sets and/or phenomena characteristics.

Table 709 shows all attributes of Observation.

Table 709 – Attributes of Environmental::Observation

name	mult	type	description
created	0..1	DateTime	inherited from: EnvironmentalInformation
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 710 shows all association ends of Observation with other classes.

Table 710 – Association ends of Environmental::Observation with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalDataProvider	0..1	EnvironmentalDataProvider	inherited from: EnvironmentalInformation
0..1	EnvironmentalAnalog	0..*	EnvironmentalAnalog	inherited from: EnvironmentalInformation
0..1	EnvironmentalDiscrete	0..*	EnvironmentalDiscrete	inherited from: EnvironmentalInformation
0..*	EnvironmentalEvent	0..*	EnvironmentalEvent	inherited from: EnvironmentalInformation
0..1	EnvironmentalPhenome	0..*	EnvironmentalPhenome	inherited from: EnvironmentalInformation

mult from	name	mult to	type	description
	non		non	
0..1	EnvironmentalStringMeasurement	0..*	EnvironmentalStringMeasurement	inherited from: EnvironmentalInformation
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.32 PhenomenonClassification

A pre-defined phenomenon classification as defined by a particular authority.

Table 711 shows all attributes of PhenomenonClassification.

Table 711 – Attributes of Environmental::PhenomenonClassification

name	mult	type	description
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 712 shows all association ends of PhenomenonClassification with other classes.

Table 712 – Association ends of Environmental::PhenomenonClassification with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalDataAuthority	0..1	EnvironmentalDataAuthority	Authority defining this environmental phenomenon.
0..1	ClassificationCondition	0..*	ClassificationCondition	Condition contributing to the classification of this phenomenon.
0..1	EnvironmentalPhenomenon	0..*	EnvironmentalPhenomenon	
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.33 ReportingCapability root class

Definition of one set of reporting capabilities for this monitoring station. The associated EnvironmentalValueSets describe the maximum range of possible environmental values the station is capable of returning. This attribute is intended primarily to assist a utility in managing its stations.

Table 713 shows all attributes of ReportingCapability.

Table 713 – Attributes of Environmental::ReportingCapability

name	mult	type	description
reportingIntervalPeriod	0..1	Integer	Number of units of time making up reporting period.
reportingIntervalType	0..1	CalculationIntervalUnitKind	Unit of time in which reporting period is expressed.
reportingMethod	0..1	ReportingMethodKind	Indicates how the weather station reports observations.

Table 714 shows all association ends of ReportingCapability with other classes.

Table 714 – Association ends of Environmental::ReportingCapability with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalMonitoringStation	1..1	EnvironmentalMonitoringStation	The environmental monitoring station to which this set of reporting capabilities belong.
0..1	EnvironmentalAnalog	0..*	EnvironmentalAnalog	One of the environmental value sets expressing one of the reporting capabilities.

6.6.34 SpaceAnalog

Analog (float) measuring a space (extra-terrestrial) condition.

Table 715 shows all attributes of SpaceAnalog.

Table 715 – Attributes of Environmental::SpaceAnalog

name	mult	type	description
kind	0..1	SpaceAnalogKind	Kind of space analog.
maxValue	0..1	Float	inherited from: Analog
minValue	0..1	Float	inherited from: Analog
normalValue	0..1	Float	inherited from: Analog
positiveFlowIn	0..1	Boolean	inherited from: Analog
measurementType	0..1	String	inherited from: Measurement
phases	0..1	PhaseCode	inherited from: Measurement
uncefactUnitCode	1..1	UncefactUnitCode	inherited from: Measurement
unitMultiplier	0..1	UnitMultiplier	inherited from: Measurement
unitSymbol	0..1	UnitSymbol	inherited from: Measurement
aliasName	0..1	String	inherited from: IdentifiedObject
description	0..1	String	inherited from: IdentifiedObject
mRID	0..1	String	inherited from: IdentifiedObject
name	0..1	String	inherited from: IdentifiedObject

Table 716 shows all association ends of SpaceAnalog with other classes.

Table 716 – Association ends of Environmental::SpaceAnalog with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalMonitoringStation	0..1	EnvironmentalMonitoringStation	inherited from: EnvironmentalAnalog
0..*	ClassificationCondition	0..1	ClassificationCondition	inherited from: EnvironmentalAnalog
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalAnalog
0..*	ReportingCapability	0..1	ReportingCapability	inherited from: EnvironmentalAnalog
1..1	AnalogValues	0..*	AnalogValue	inherited from: Analog
0..*	LimitSets	0..*	AnalogLimitSet	inherited from: Analog
0..*	Terminal	0..1	ACDCTerminal	inherited from: Measurement
0..*	PowerSystemResource	0..1	PowerSystemResource	inherited from: Measurement
0..1	DiagramObjects	0..*	DiagramObject	inherited from: IdentifiedObject
1..1	Names	0..*	Name	inherited from: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	inherited from: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	inherited from: IdentifiedObject

6.6.35 SpacePhenomenon

An extra-terrestrial phenomenon.

Table 717 shows all attributes of SpacePhenomenon.

Table 717 – Attributes of Environmental::SpacePhenomenon

name	mult	type	description
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 718 shows all association ends of SpacePhenomenon with other classes.

Table 718 – Association ends of Environmental::SpacePhenomenon with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.36 Tornado

A tornado, a violent destructive whirling wind accompanied by a funnel-shaped cloud that progresses in a narrow path over the land.

Table 719 shows all attributes of Tornado.

Table 719 – Attributes of Environmental::Tornado

name	mult	type	description
fScale	0..1	FScale	Fujita scale (referred to as EF-scale starting in 2007) for the tornado.
width	1..1	Length	Width of the tornado during the time interval.
altitude	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
base	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
direction	0..1	Bearing	inherited from: AtmosphericPhenomenon
maxCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon
minCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon
speed	0..1	Speed	inherited from: AtmosphericPhenomenon
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 720 shows all association ends of Tornado with other classes.

Table 720 – Association ends of Environmental::Tornado with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.37 TropicalCycloneAustralia

A tropical cyclone, a subtype of cyclone that forms to the east of 90°E in the Southern Hemisphere whose intensity is measured by the Australian tropical cyclone intensity scale.

Table 721 shows all attributes of TropicalCycloneAustralia.

Table 721 – Attributes of Environmental::TropicalCycloneAustralia

name	mult	type	description
category	0..1	Integer	Strength of tropical cyclone during the time interval, based on Australian Bureau of Meteorology Category System where: 1 – tropical cyclone, with typical gusts over flat land 90-125 km/h 2 – tropical cyclone, with typical gusts over flat land 125-164 km/h 3 – severe tropical cyclone, with typical gusts over flat land 165-224 km/h 4 – severe tropical cyclone, with typical gusts over flat land 225-279 km/h 5 – severe tropical cyclone, with typical gusts over flat land greater than 280 km/h.
centralPressure	0..1	Pressure	inherited from: Cyclone
maxSurfaceWindSpeed	0..1	Speed	inherited from: Cyclone
windForce	0..1	Integer	inherited from: Cyclone

name	mult	type	description
altitude	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
base	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
direction	0..1	Bearing	inherited from: AtmosphericPhenomenon
maxCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon
minCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon
speed	0..1	Speed	inherited from: AtmosphericPhenomenon
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 722 shows all association ends of TropicalCycloneAustralia with other classes.

Table 722 – Association ends of Environmental::TropicalCycloneAustralia with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.38 Tsunami

A tsunami (tidal wave), a long high sea wave caused by an earthquake, submarine landslide, or other disturbance.

Table 723 shows all attributes of Tsunami.

Table 723 – Attributes of Environmental::Tsunami

name	mult	type	description
intensity	0..1	Integer	Tsunami intensity on the Papadopoulos-Imamura tsunami intensity scale. Possible values are 1-12, corresponding to I-XII.
magnitude	0..1	Float	Tsunami magnitude in the Tsunami Magnitude Scale (Mt). Is greater than zero.
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 724 shows all association ends of Tsunami with other classes.

Table 724 – Association ends of Environmental::Tsunami with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.39 VolcanicAshCloud

An ash cloud formed as a result of a volcanic eruption.

Table 725 shows all attributes of VolcanicAshCloud.

Table 725 – Attributes of Environmental::VolcanicAshCloud

name	mult	type	description
density	0..1	ParticulateDensity	Particulate density of the ash cloud during the time interval.
particleSize	0..1	Length	The diameter of the particles during the time interval.
altitude	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
base	0..1	RelativeDisplacement	inherited from: AtmosphericPhenomenon
direction	0..1	Bearing	inherited from: AtmosphericPhenomenon
maxCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon
minCoverage	0..1	PerCent	inherited from: AtmosphericPhenomenon
speed	0..1	Speed	inherited from: AtmosphericPhenomenon
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 726 shows all association ends of VolcanicAshCloud with other classes.

Table 726 – Association ends of Environmental::VolcanicAshCloud with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.40 Whirlpool

A whirlpool, a rapidly rotating mass of water in a river or sea into which objects may be drawn, typically caused by the meeting of conflicting currents.

Table 727 shows all attributes of Whirlpool.

Table 727 – Attributes of Environmental::Whirlpool

name	mult	type	description
timeInterval	0..1	DateTimeInterval	inherited from: EnvironmentalPhenomenon

Table 728 shows all association ends of Whirlpool with other classes.

Table 728 – Association ends of Environmental::Whirlpool with other classes

mult from	name	mult to	type	description
0..*	EnvironmentalInformation	0..1	EnvironmentalInformation	inherited from: EnvironmentalPhenomenon
0..*	EnvironmentalLocationKind	0..*	EnvironmentalLocationType	inherited from: EnvironmentalPhenomenon
0..*	PhenomenonClassification	0..1	PhenomenonClassification	inherited from: EnvironmentalPhenomenon

6.6.41 Package EnvDomain

6.6.41.1 General

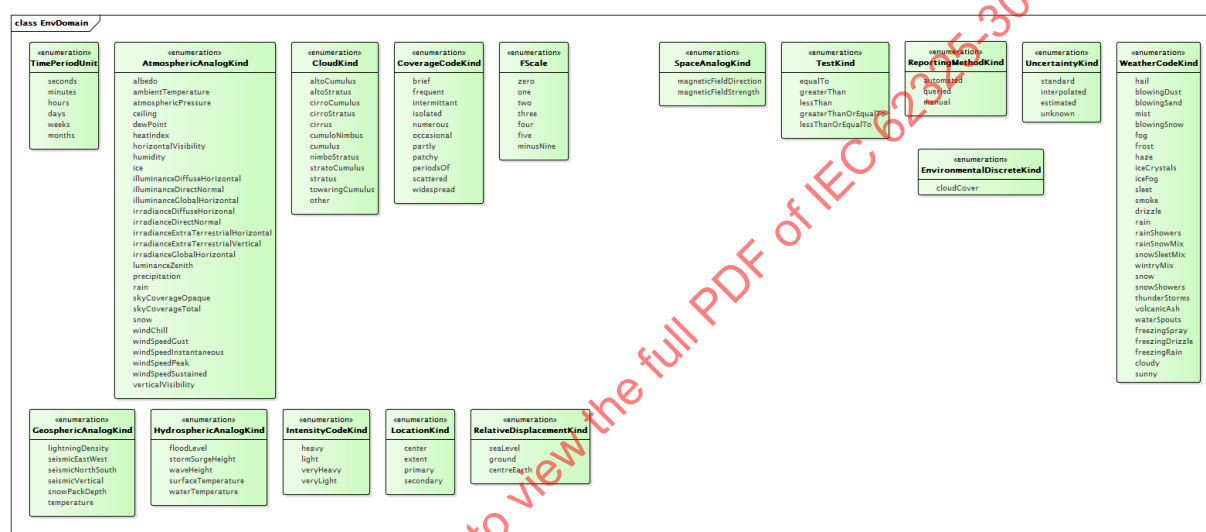
**Figure 80 – Class diagram EnvDomain::EnvDomain**

Figure 80: Illustrates the data types and enumerations which support the Environmental package classes in addition to the data types and enumerations which are contained within the IEC 61970, IEC 61968 and IEC 62325 packages.

6.6.41.2 RelativeDisplacement compound

Vertical displacement relative to either sealevel, ground or the center of the earth.

Table 729 shows all attributes of RelativeDisplacement.

Table 729 – Attributes of EnvDomain::RelativeDisplacement

name	mult	type	description
displacement	0..1	Displacement	
kind	0..1	RelativeDisplacementKind	

6.6.41.3 AtmosphericAnalogKind enumeration

Kinds of analogs (floats) measuring an atmospheric condition.

Table 730 shows all literals of AtmosphericAnalogKind.

Table 730 – Literals of EnvDomain::AtmosphericAnalogKind

literal	value	description
albedo		
ambientTemperature		The temperature measured by a thermometer exposed to the air in a place sheltered from direct solar radiation. Also known as "dry bulb" because the air temperature is indicated by a thermometer not affected by the moisture of the air.
atmosphericPressure		
ceiling		
dewPoint		The temperature to which air must be cooled at constant pressure and constant water-vapor content in order for saturation to occur. In other words, it is the temperature at which water vapor starts to condense out of the air.
heatIndex		The temperature of how hot it "feels like" for a given combination of warm air temperature and relative humidity.
horizontalVisibility		
humidity		
ice		
illuminanceDiffuseHorizontal		
illuminanceDirectNormal		
illuminanceGlobalHorizontal		
irradianceDiffuseHorizontal		
irradianceDirectNormal		
irradianceExtraTerrestrialHorizontal		
irradianceExtraTerrestrialVertical		
irradianceGlobalHorizontal		
luminanceZenith		
precipitation		
rain		
skyCoverageOpaque		
skyCoverageTotal		
snow		Snow amount over a specified period of time.
windChill		The temperature of how cold it "feels like" based on the rate of heat loss from exposed skin caused by the effects of wind and cold temperatures.
windSpeedGust		Maximum instantaneous wind speed in the 10 minute period preceding a moment in time so long as more than 10 knots of difference has been exhibited between peaks and lulls during that 10 minute time period. 0 value means no gusts during preceding 10 minute period.
windSpeedInstantaneous		Wind speed at a moment in time.
windSpeedPeak		Peak instantaneous wind speed in the 60 minutes preceding a moment in time as long as peak speed greater than 25 knots. 0 value means speed did not exceed 25 knots during preceding 60 minutes.
windSpeedSustained		Average instantaneous wind speed over the 2-minute time period preceding a moment in time.
verticalVisibility		

6.6.41.4 CloudKind enumeration

Kind of cloud.

Table 731 shows all literals of CloudKind.

Table 731 – Literals of EnvDomain::CloudKind

literal	value	description
altoCumulus		
altoStratus		
cirroCumulus		
cirroStratus		
cirrus		
cumuloNimbus		
cumulus		
nimboStratus		
stratoCumulus		
stratus		
toweringCumulus		
other		

6.6.41.5 CoverageCodeKind enumeration

Kinds of weather condition coverage.

Table 732 shows all literals of CoverageCodeKind.

Table 732 – Literals of EnvDomain::CoverageCodeKind

literal	value	description
brief		
frequent		
intermittant		
isolated		
numerous		
occasional		
partly		
patchy		
periodsOf		
scattered		
widespread		

6.6.41.6 EnvironmentalDiscreteKind enumeration

Discrete (integer) measuring an environmental condition.

Table 733 shows all literals of EnvironmentalDiscreteKind.

Table 733 – Literals of EnvDomain::EnvironmentalDiscreteKind

literal	value	description
cloudCover		Cloud cover in octa.

6.6.41.7 FScale enumeration

Fujita scale (referred to as EF-scale starting in 2007) for tornado damage. A set of wind estimates (not measurements) based on damage. It uses three-second gusts estimated at the point of damage based on a judgment of 8 levels of damage to 28 indicators. These estimates vary with height and exposure.

The 3 second gust is not the same wind as in standard surface observations.

Enumerations based on NOAA conventions.

Table 734 shows all literals of FScale.

Table 734 – Literals of EnvDomain::FScale

literal	value	description
zero		65-85 mph 3-second gust.
one		86-110 mph 3-second gust.
two		111-135 mph 3-second gust.
three		136-165 mph 3-second gust.
four		166-200 mph 3-second gust.
five		Over 200 mph 3-second gust.
minusNine		Unknown.

6.6.41.8 GeosphericAnalogKind enumeration

Kinds of analogs (floats) measuring a geospheric condition.

Table 735 shows all literals of GeosphericAnalogKind.

Table 735 – Literals of EnvDomain::GeosphericAnalogKind

literal	value	description
lightningDensity		Flash rate in strikes/hour/km2.
seismicEastWest		
seismicNorthSouth		
seismicVertical		
snowPackDepth		
temperature		

6.6.41.9 HydrosphericAnalogKind enumeration

Kinds of analogs (floats) measuring a hydrospheric condition.

Table 736 shows all literals of HydrosphericAnalogKind.

Table 736 – Literals of EnvDomain::HydrosphericAnalogKind

literal	value	description
floodLevel		
stormSurgeHeight		
waveHeight		
surfaceTemperature		
waterTemperature		

6.6.41.10 IntensityCodeKind enumeration

Kinds of weather condition intensity.

Table 737 shows all literals of IntensityCodeKind.

Table 737 – Literals of EnvDomain::IntensityCodeKind

literal	value	description
heavy		
light		
veryHeavy		
veryLight		

6.6.41.11 LocationKind enumeration

The nature of the location being defined for an environmental entity. Possible values are center, perimeter, primary, secondary.

Table 738 shows all literals of LocationKind.

Table 738 – Literals of EnvDomain::LocationKind

literal	value	description
center		The center of a phenomenon. Will typically be used with a Location with a single PositionPoint instance.
extent		The area or line of a phenomenon, not the center. Will typically be used with a Location with multiple PositionPoint instances.
primary		Primary area to which an environmental alert applies.
secondary		Secondary area to which an environmental alert applies.

6.6.41.12 RelativeDisplacementKind enumeration

The types of relative displacement

Table 739 shows all literals of RelativeDisplacementKind.

Table 739 – Literals of EnvDomain::RelativeDisplacementKind

literal	value	description
seaLevel		
ground		
centreEarth		

6.6.41.13 SpaceAnalogKind enumeration

Kinds of analogs (floats) measuring a space condition.

Table 740 shows all literals of SpaceAnalogKind.

Table 740 – Literals of EnvDomain::SpaceAnalogKind

literal	value	description
magneticFieldDirection		
magneticFieldStrength		

6.6.41.14 TestKind enumeration

The test applied to determine if the condition is met.

Table 741 shows all literals of TestKind.

Table 741 – Literals of EnvDomain::TestKind

literal	value	description
equalTo		
greaterThan		
lessThan		
greaterThanOrEqualTo		
lessThanOrEqualTo		

6.6.41.15 TimePeriodUnit enumeration

Units in which reporting frequency is specified.

Table 742 shows all literals of TimePeriodUnit.

Table 742 – Literals of EnvDomain::TimePeriodUnit

literal	value	description
seconds		
minutes		
hours		
days		
weeks		
months		

6.6.41.16 ReportingMethodKind enumeration

Method by which information is gathered from station.

Table 743 shows all literals of ReportingMethodKind.

Table 743 – Literals of EnvDomain::ReportingMethodKind

literal	value	description
automated		Station automatically reports.
queried		Station must be queried to obtain observations.
manual		Station must be physically visited to gather observations.

6.6.41.17 UncertaintyKind enumeration

The type of uncertainty for a reading.

Table 744 shows all literals of UncertaintyKind.

Table 744 – Literals of EnvDomain::UncertaintyKind

literal	value	description
standard		The value has standard uncertainty consistent with National Weather Service practises given the instrument and manner of observation.
interpolated		The value is interpolated.
estimated		The value is estimated.
unknown		The process of value calculation or measurement is unknown.

6.6.41.18 WeatherCodeKind enumeration

Kinds of weather conditions.

Table 745 shows all literals of WeatherCodeKind.

Table 745 – Literals of EnvDomain::WeatherCodeKind

literal	value	description
hail		"A" weather code ("Hail").
blowingDust		"BD" weather code ("Blowing Dust").
blowingSand		"BN" weather code ("Blowing Sand").
mist		"BR" weather code ("Mist").
blowingSnow		"BS" weather code ("Blowing Snow").
fog		"F" weather code ("Fog").
frost		"FR" weather code ("Frost").
haze		"H" weather code ("Haze").
iceCrystals		"IC" weather code ("Ice Crystals").
iceFog		"IF" weather code ("Ice Fog").
sleet		"IP" weather code ("Ice Pellets/Sleet").
smoke		"K" weather code ("Smoke").
drizzle		"L" weather code ("Drizzle").

literal	value	description
rain		"R" weather code ("Rain").
rainShowers		"RW" weather code ("Rain Showers").
rainSnowMix		"RS" weather code ("Rain/Snow Mix").
snowSleetMix		"SI" weather code ("Snow/Sleet Mix").
wintryMix		"WS" weather code ("Wintry Mix").
snow		"S" weather code ("Snow").
snowShowers		"SW" weather code ("Snow Showers").
thunderStorms		"T" weather code ("Thunder Storms").
volcanicAsh		"VA" weather code ("Volcanic Ash").
waterSpouts		"WP" weather code ("Water Spouts").
freezingSpray		"ZF" weather code ("Freezing Spray").
freezingDrizzle		"ZL" weather code ("Freezing Drizzle").
freezingRain		"ZR" weather code ("Freezing Rain").
cloudy		
sunny		

6.6.41.19 Bearing datatype

The bearing in degrees (with 360 degrees being True North). Measured in degrees clockwise from True North. 0 degrees indicates no direction being given.

Table 746 shows all attributes of Bearing.

Table 746 – Attributes of EnvDomain::Bearing

name	mult	type	description
multiplier	0..1	UnitMultiplier	(const=none)
unit	0..1	UnitSymbol	(const=deg)
value	0..1	Float	

6.6.41.20 MagneticField datatype

Magnetic field in nanotesla.

Table 747 shows all attributes of MagneticField.

Table 747 – Attributes of EnvDomain::MagneticField

name	mult	type	description
multiplier	0..1	UnitMultiplier	(const=n)
unit	0..1	UnitSymbol	(const=T)
value	0..1	Float	

6.6.41.21 ParticulateDensity datatype

Particulate density as kg/m³.

Table 748 shows all attributes of ParticulateDensity.

Table 748 – Attributes of EnvDomain::ParticulateDensity

name	mult	type	description
multiplier	0..1	UnitMultiplier	(const=none)
unit	0..1	UnitSymbol	(const=kgPerm3)
value	0..1	Float	

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

CADRE POUR LES COMMUNICATIONS POUR LE MARCHÉ DE L'ÉNERGIE –

Partie 301: Extensions du modèle d'information commun (CIM) pour les marchés

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La Norme internationale IEC 62325-301 a été établie par le comité d'études 57 de l'IEC: Gestion des systèmes de puissance et échanges d'informations associés.

Cette deuxième édition annule et remplace la première édition parue en 2014. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) la prise en charge des conditions environnementales météorologiques;
- b) la communication côté demande pour les marchés nord-américains;

- c) les réglementations relatives à la transparence et le couplage de marchés fondé sur les flux, ainsi que les codes de réseaux pris en charge pour les marchés européens;
- d) les mises à jour de la classe RegisteredResource.

Le texte de cette norme est issu des documents suivants:

FDIS	Rapport de vote
57/1947/FDIS	57/1961/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Cette publication a été rédigée selon les Directives ISO/IEC, Partie 2.

Tout au long du présent document, les références sont basées sur le modèle UML. Les références à des paquetages et classes UML spécifiques sont effectuées en citant le nom du paquetage ou de la classe entre guillemets simples (par exemple: 'IEC 61970' ou 'IdentifiedObject').

Une liste de toutes les parties de la série IEC 62325, publiées sous le titre général *Cadre pour les communications pour le marché de l'énergie*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de cette publication ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives à la publication recherchée. À cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

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INTRODUCTION

La présente partie de l'IEC 62325 est une norme faisant partie d'une série de normes concernant les échanges d'informations relatives au marché déréglementé de l'énergie. Cette série de normes a été initialement fondée sur les travaux réalisés par les gestionnaires de réseaux de transport européens TF 14 EDI (Échange de données informatisé) et dans le cadre des publications de l'Institut de recherches sur la production d'électricité (EPRI – Electric Power Research Institute) TR 1009455 et TR 1011431 (Extensions du CIM pour la prise en charge des opérations du marché, phase 1 et phase 2).

Le principal objectif de la série IEC 62325 est de produire des normes destinées à faciliter l'intégration de logiciels d'application pour le marché, développés de façon indépendante par différents fournisseurs, dans un système de gestion de marché, ainsi que l'intégration des systèmes de gestion de marché et des systèmes participant au marché. Cela s'effectue par la définition d'échanges de messages pour permettre à ces applications ou systèmes d'accéder aux données publiques et d'échanger des informations, indépendamment de la façon dont ces informations sont représentées en interne.

Le modèle d'information commun (CIM) spécifie la base de la sémantique pour cet échange de messages. Les spécifications de profil, qui sont contenues dans d'autres parties de l'IEC 62325, précisent le contenu des messages échangés. Elles prennent en charge les marchés de style européen, fondés sur les règlements européens et sur les concepts d'accès de tiers au réseau et de répartition du marché en zones, et les marchés de style nord-américain, caractérisés par une gestion de la production à J-1 effectuée par un opérateur du marché, par un équilibrage intrajournalier et en temps réel par le biais d'un système de répartition central, et par règlement selon les prix marginaux locaux. Ces marchés sont utilisés aux États-Unis et dans d'autres régions du monde, et ne se limitent pas exclusivement à l'Amérique du Nord.

Le CIM est un modèle abstrait contenant tous les objets principaux d'une entreprise de distribution d'électricité habituellement nécessaires pour représenter les opérations d'une entreprise d'électricité. Ce modèle inclut les classes et les attributs publics de ces objets, ainsi que les relations entre eux.

La série IEC 62325 fait partie d'une série de normes traitant du CIM. L'IEC 61970 définit les interfaces de programmation d'application EMS et l'IEC 61968 définit les interfaces système pour la gestion de distribution. L'IEC 62325-301 correspond à l'IEC 61970-301 et à l'IEC 61968-11, qui décrivent des parties du modèle d'information commun applicables aux interfaces de modélisation des systèmes EMS, DMS et MMS. Alors qu'il existe plusieurs séries de normes de l'IEC qui traitent des différentes parties du CIM, un seul modèle d'information unifié comprenant le CIM est derrière toutes ces séries de normes individuelles.

CADRE POUR LES COMMUNICATIONS POUR LE MARCHÉ DE L'ÉNERGIE –

Partie 301: Extensions du modèle d'information commun (CIM) pour les marchés

1 Domaine d'application

La présente partie de la norme IEC 62325 spécifie le modèle d'information commun (CIM) relatif aux communications pour le marché de l'énergie.

Le CIM est un modèle abstrait de tous les objets principaux d'une entreprise de distribution d'électricité habituellement impliqués dans les opérations de l'entreprise et dans la gestion du marché de l'électricité. En fournissant une façon normalisée de représenter des ressources de systèmes électriques comme classes et attributs d'objets ainsi que leurs relations, le CIM facilite l'intégration des applications de système de gestion de marché (MMS) développées de façon indépendante par différents fournisseurs, entre des systèmes MMS complets développés de façon indépendante, ou entre un système MMS et d'autres systèmes concernés par différents aspects de la gestion de marché, tels que l'attribution de la capacité, la gestion à J-1, l'équilibrage, le règlement, etc.

Le CIM facilite l'intégration en définissant un langage commun (c'est-à-dire, une sémantique) fondé sur le modèle CIM pour permettre à ces applications ou systèmes d'accéder aux données publiques et d'échanger des informations indépendamment de la représentation interne de ces informations.

Les classes d'objets représentées dans le CIM sont de nature abstraite et peuvent être utilisées dans une large gamme d'applications. L'utilisation du CIM n'est pas limitée à son application dans un système de gestion de marché.

En raison de la taille du CIM complet, les classes d'objets qui le composent sont regroupées en un certain nombre de paquetages logiques, qui représentent chacun une certaine partie du système électrique modélisé. Les collections de ces paquetages sont fournies progressivement sous forme de Normes internationales distinctes. Le présent document particulier spécifie un ensemble de paquetages qui offrent une vue logique sur les aspects fonctionnels de la gestion d'un marché de l'électricité et sur d'autres aspects fonctionnels comprenant les aspects environnementaux qui sont étroitement liés aux marchés de l'électricité et qui sont partagés par toutes les applications. D'autres normes spécifient des aspects plus spécifiques du modèle qui ne sont nécessaires qu'à certaines applications. Le Paragraphe 4.2 définit le découpage actuel des paquetages dans les documents normatifs.

Cette nouvelle édition de l'IEC 62325-301 tient compte de la communication côté demande dans un marché de vente en gros. Les ajouts apportés à l'IEC 62325-301 comprennent la prise en charge de l'enregistrement des ressources et l'enregistrement d'une ressource participant à un marché côté demande ainsi que la prise en charge en vue du déploiement et de l'évaluation des performances des ressources côté demande. Un nouveau paquetage a été inclus dans cette édition de l'IEC 62325-301 afin de prendre en charge les données environnementales (météorologiques). Ce nouveau paquetage 'Environmental' fournit la prise en charge des conditions météorologiques, y compris les prévisions, les observations, les mesures, les phénomènes et les alertes. Des mises à jour supplémentaires ont été ajoutées au paquetage 'MarketManagement' afin de prendre en charge les réglementations relatives à la transparence, le couplage de marchés fondé sur les flux et les nouveaux codes de réseaux pris en charge pour les marchés européens. Ces mises à jour comprennent de nouvelles classes, de nouveaux attributs et de nouvelles associations dans les paquetages IEC 62325,

ainsi que des mises à jour des classes, attributs et associations existants, afin de représenter avec exactitude les cas d'utilisation existants.

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 61968-11, *Intégration d'applications pour les services électriques – Interfaces système pour la gestion de distribution – Partie 11: Extensions du modèle d'information commun (CIM) pour la distribution*

IEC TS 61970-2:2004, *Energy management system application program interface (EMS-API) – Part 2: Glossary* (disponible en anglais seulement)

IEC 61970-301, *Interface de programmation d'application pour système de gestion d'énergie (EMS-API) – Partie 301: Base de modèle d'information commun (CIM)*

IEC 61970-302, *Interface de programmation d'application pour système de gestion d'énergie (EMS-API) – Partie 302: CIM pour régimes dynamiques*

IEC 62325-450, *Cadre pour les communications pour le marché de l'énergie – Partie 450: Règles de modélisation de profils et de contextes*

Object management group: *UML 2.0 specification* – disponible à l'adresse <<http://www.omg.org>>

3 Termes, définitions et abréviations

Pour les besoins du présent document, les termes et définitions de l'IEC TS 61970-2 s'appliquent.

L'ISO et l'IEC tiennent à jour des bases de données terminologiques destinées à être utilisées en normalisation, consultables aux adresses suivantes:

- IEC Electropedia: disponible à l'adresse <http://www.electropedia.org/>
- ISO Online browsing platform: disponible à l'adresse <http://www.iso.org/obp>

3.1 Termes et définitions

3.1.1

interface de programmation d'application

API

ensemble des fonctions publiques offertes par un composant exécutable d'application et destinées à être utilisées par d'autres composants exécutables d'application

Note 1 à l'article: L'abréviation "API" est dérivée du terme anglais développé correspondant "application program interface".

[SOURCE: IEC 61970-2:2004, 3.4]

3.1.2

langage de balisage extensible

XML

langage de marquage qui définit un ensemble de règles pour le codage des documents dans un format lisible à la fois par l'homme et la machine

Note 1 à l'article: L'abréviation "XML" est dérivée du terme anglais développé correspondant "Extensible Markup Language".

3.1.3

description de schéma XML

XSD

langage XML utilisé pour décrire et contrôler le contenu des documents XML

Note 1 à l'article: L'abréviation "XSD" est dérivée du terme anglais développé correspondant "XML schema description".

3.1.4

marchés intrajournaliers

marchés de programmation intrajournalière qui affinent l'engagement et les programmes produits par les marchés à J-1

3.1.5

prévision de charge

système de prévision de charge qui prédit la charge pour l'horizon temporel spécifié

3.1.6

prix marginal local

LMP

coût marginal (devise/MWh) qui sert l'incrément suivant de demande au niveau d'un nœud de tarification en cohérence avec les contraintes de transport existantes et les caractéristiques de performances des ressources

Note 1 à l'article: L'abréviation "LMP" est dérivée du terme anglais développé correspondant "Locational Marginal Price".

3.1.7

système de gestion de marché

MMS

système informatique comprenant une plate-forme logicielle offrant les services de support de base et un ensemble d'applications offrant les fonctionnalités nécessaires à une gestion efficace du marché de l'électricité

Note 1 à l'article: L'abréviation "MMS" est dérivée du terme anglais développé correspondant "Market Management System".

Note 2 à l'article: Ces systèmes informatiques intégrés à un marché de l'électricité peuvent comprendre un service de support à l'attribution de la capacité, à la planification de l'énergie, aux services auxiliaires ou autres, aux opérations et aux règlements en temps réel.

3.1.8

programmeur (scheduler)

système de programmation pour les ressources qui produisent, consomment ou transportent de l'énergie ou des services auxiliaires dans un marché de l'énergie

3.1.9

accès tiers

concept dans les systèmes de gestion de marché qui permet aux tiers d'utiliser le système de transmission au même titre que les autres

3.1.10

langage de modélisation unifié

UML

langage de modélisation dans le domaine de l'ingénierie logicielle orientée objet qui est géré par l'Object Management Group (OMG)

Note 1 à l'article: L'abréviation "UML" est dérivée du terme anglais développé correspondant "Unified Modeling Language".

3.1.11

schéma RDF

RDFS

recommandation W3C qui fournit des éléments de base pour la description des ontologies

Note 1 à l'article: L'abréviation "RDFS" est dérivée du terme anglais développé correspondant "RDF schema".

3.1.12

langage d'ontologies Web

OWL

recommandation W3C qui fournit un langage de représentation de connaissances pour la création d'ontologies

Note 1 à l'article: L'abréviation "OWL" est dérivée du terme anglais développé correspondant "Ontology Web Language".

3.2 Abréviations

CRR	congestion revenue rights (droits à revenu de congestion)
DAM	day ahead market (marché à J-1 qui détermine l'engagement et les programmes des ressources)
DMS	distribution management system (système de gestion de la distribution)
EMS	energy management system (système de gestion d'énergie)
MDMS	meter data management system (système de gestion des données de compteur)
RTM	real time markets (marchés en temps réel qui finalisent la répartition pour les ressources système)

4 Spécification du CIM

4.1 Notation de modélisation du CIM

Le CIM est défini à l'aide de techniques de modélisation orientées objet. Plus précisément, la spécification du CIM utilise la notation du langage de modélisation unifié (UML), qui définit le CIM comme un groupe de paquetages.

Chaque paquetage du CIM contient un ou plusieurs diagrammes de classe représentant sous forme graphique toutes les classes de ce paquetage et leurs relations. Chaque classe est ensuite définie de façon textuelle en mettant l'accent sur ses attributs et ses relations avec d'autres classes.

La notation UML est décrite dans la norme de l'Object Management Group (OMG) et dans plusieurs autres manuels publiés.

4.2 Paquetages CIM

Le CIM est fractionné en un ensemble de paquetages. Un package est un moyen général permettant de grouper des éléments liés à un modèle. Les paquetages ont été choisis pour simplifier la conception, la compréhension et la révision du modèle. Le modèle d'information commun se compose de l'ensemble des paquetages. Des entités peuvent avoir des associations dépassant les limites de plusieurs paquetages. Chaque application peut utiliser des informations représentées dans plusieurs paquetages.

Le CIM complet est fractionné en groupes de paquetages, ce qui facilite la gestion et la maintenance. La norme IEC 62325-301 inclut les paquetages suivants:

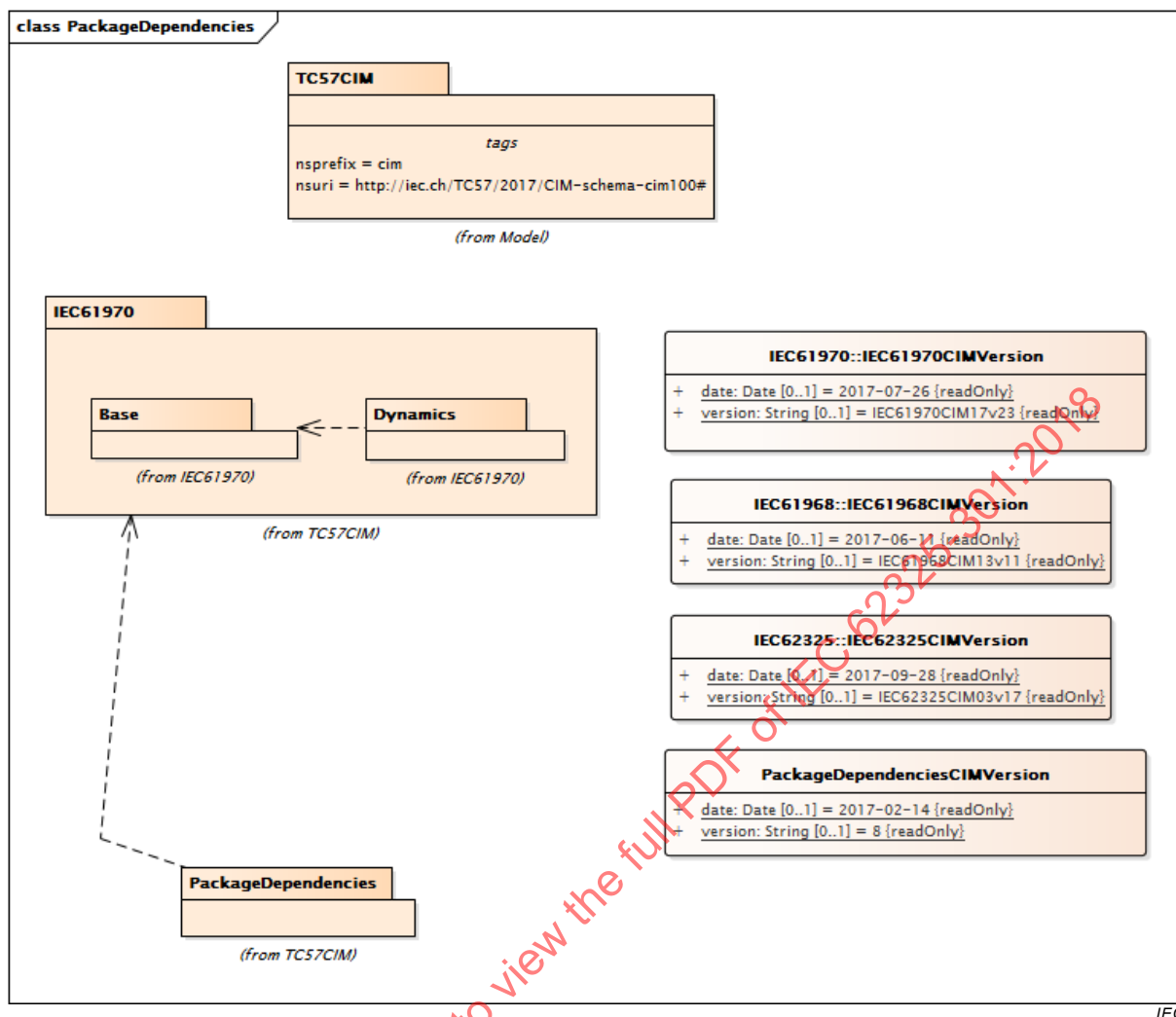
- 'MarketCommon'
- 'MarketManagement'
- 'MarketOperations'
- 'Environmental'

Les paquetages utilisés par l'IEC 61970-301 et les paquetages utilisés par l'IEC 61968-11 décrivent des parties supplémentaires du CIM qui traitent d'autres vues logiques des opérations d'une entreprise de service public, comprenant les modèles de réseaux, la production, la charge, les indisponibilités, le patrimoine, les emplacements, les activités, les clients, la documentation et la gestion des travaux.

NOTE Les limites d'un package n'impliquent pas de limites pour les applications. Une application peut utiliser des entités CIM de différents paquetages.

L'IEC 62325-301 est publiée sur la base des versions stables et convenues de l'IEC 61970 et de l'IEC 61968.

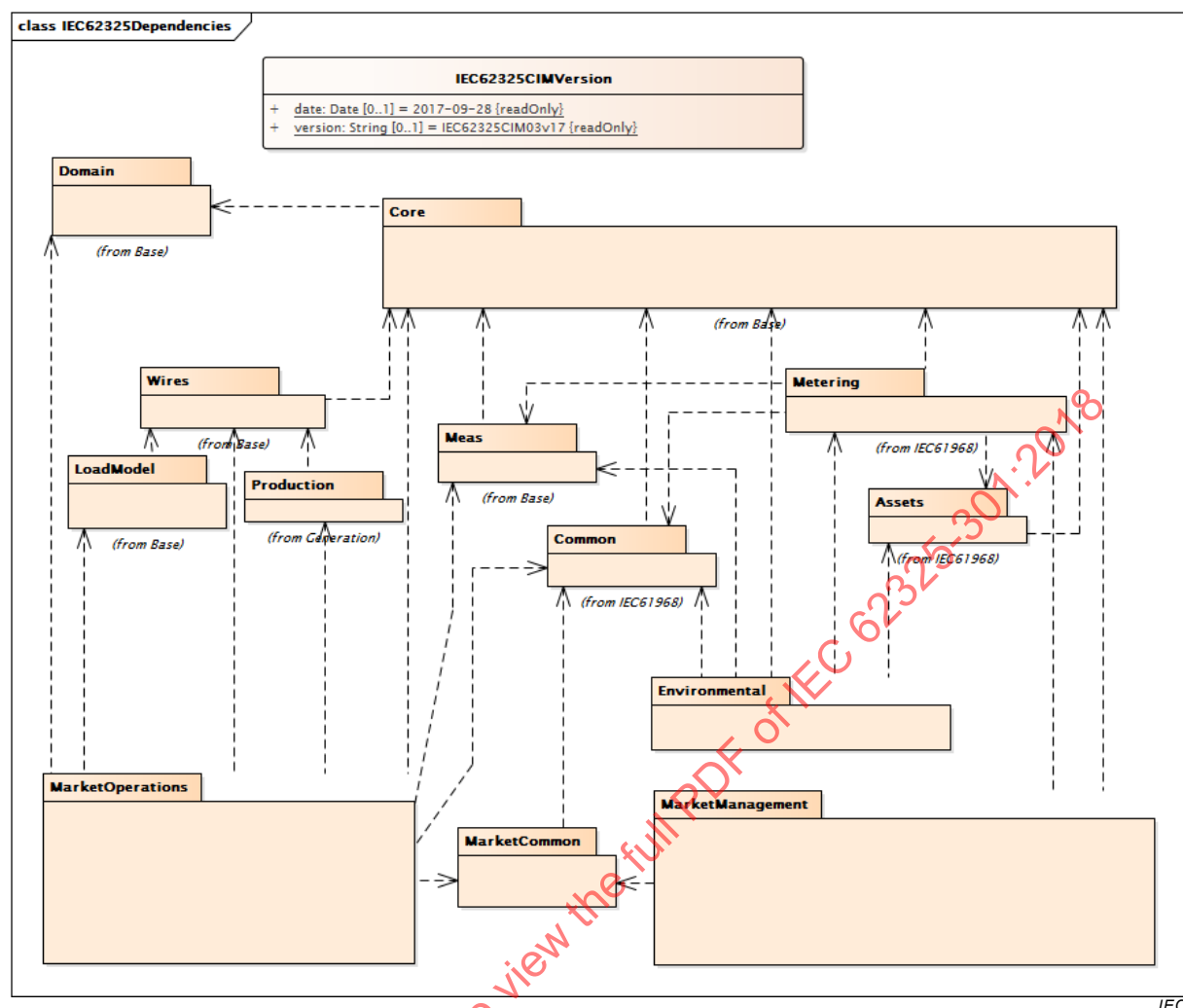
La Figure 1 représente les dépendances de paquetages. Le package 'IEC 62325' et ses sous-paquetages dépendent des paquetages 'IEC 61970' et 'IEC 61968'. Le package 'IEC 61970' est utilisé par la série de normes IEC 61970 comme un modèle central qui représente les ressources des systèmes électriques et leurs relations. Le package 'IEC 61968' est utilisé par la série de normes IEC 61968 qui décrit les vues logiques des opérations d'une entreprise de service public, y compris vue du patrimoine, des emplacements, des activités, des clients, de la documentation, de la gestion des travaux et des modèles de comptage. Les lignes tiretées indiquent une relation de dépendance, la flèche allant du package dépendant vers le package dont il dépend.



Anglais	Français
from	provenant de

Figure 1 – Diagramme des dépendances de packages 'TC 57CIM'

La Figure 2 représente les packages définis pour l'IEC 62325-301 et leurs relations de dépendance. Les lignes tiretées indiquent une relation de dépendance, la flèche allant du package dépendant vers le package dont il dépend. Les packages de l'IEC 62325 incluent les dépendances à l'égard des packages décrits dans la série IEC 61970 et la série IEC 61968. Ces dépendances sont représentées dans le diagramme.



Anglais	Français
from	provenant de

Figure 2 – Diagramme des dépendances de packages ‘IEC 62325’

L'Article 6 contient la spécification associée à chacun des packages du CIM.

NOTE Le contenu du CIM défini dans la présente spécification a été créé automatiquement à partir de la version IEC62325CIM03v17 du modèle électronique UML du CIM, qui est disponible auprès du groupe des utilisateurs du CIM (CIM Users Group).

4.3 Classes CIM et relations

4.3.1 Classes

Le ou les diagrammes de classe de chaque package du CIM représentent toutes les classes du package et leurs relations. Lorsque des relations existent avec des classes appartenant à d'autres packages, ces classes sont également représentées.

Les classes et les objets modélisent ce qui se trouve dans un système électrique et qui nécessite d'être représenté de la même façon pour les applications du marché. Une classe est une description d'un objet réel, tel qu'une offre, une ressource enregistrée ou une charge enregistrée, qui nécessite d'être représenté comme faisant partie de l'ensemble du marché de l'électricité dans un MMS. Parmi les autres types d'objets figurent des éléments tels que les programmes et les mesures que des applications MMS nécessitent également de traiter, d'analyser et d'enregistrer. De tels objets nécessitent une représentation commune pour

atteindre les objectifs de compatibilité de connexion et d'interopérabilité de la présente norme. Un objet particulier d'un système électrique ayant une identité unique est modélisé comme une instance de la classe à laquelle il appartient.

Dans le présent document, lorsqu'un en-tête comprend l'expression "classe racine", cela signifie que la classe n'a pas d'héritage et n'a pas de stéréotype.

Le CIM est défini pour faciliter l'échange de données. Comme défini dans le présent document, les entités du CIM n'ont pas de comportement. L'IEC 62325-450, *Cadre pour les communications pour le marché de l'énergie – Partie 450: Règles de modélisation de profils et de contextes* définit les principes de modélisation pour générer un profil et les principes du cadre de modélisation pour définir la charge utile de message.

Les classes comportent des attributs qui décrivent les caractéristiques des objets. Chaque classe du CIM contient les attributs décrivant et identifiant une instance spécifique de la classe. Seuls les attributs d'intérêt public pour les applications MMS sont inclus dans les descriptions de classes.

Chaque attribut possède un type qui identifie le type d'attribut dont il s'agit. Les attributs typiques sont de type 'Integer' (entier), 'Float' (flottant), 'Boolean' (booléen), 'String' (chaîne), 'Datetime' (date et heure), 'Date', 'Duration' (durée) et 'Decimal' (décimal), qui sont appelés types primitifs. Cependant, de nombreux types supplémentaires sont définis comme partie intégrante de la spécification CIM. Par exemple, 'RegisteredGenerator' a un attribut 'maxDependableCap' de type 'ActivePower'. La définition de nombreux types partagés est contenue dans le paquetage 'Domain' décrit à l'Article 6. Les stéréotypes 'Primitive', 'enumeration', 'CIMDatatype' et 'Compound' de l'UML sont ajoutés aux classes utilisées comme types:

- Le stéréotype 'CIMDatatype' est utilisé avec une sémantique spécifique du CIM pour décrire un type ayant plusieurs attributs {'value', 'unit', 'multiplier', 'denominatorUnit', 'denominatorMultiplier'}, qui implique une mise en correspondance personnalisée avec des artefacts de sérialisation tels que RDFS, OWL et XSD. Les classes ayant ces stéréotypes ne participent pas à des relations de généralisation ou d'association et sont simplement utilisées comme types pour des attributs.
- Le stéréotype 'enumeration' est utilisé pour décrire le type d'un attribut avec une liste énumérée de choix.
- Le stéréotype 'Compound' est utilisé pour décrire des ensembles d'attributs liés qui sont couramment réutilisés. Les classes 'Compound' peuvent se composer d'attributs de type 'Primitive', 'enumeration', 'CIMDatatype' ou d'autres classes 'Compound', à condition que les classes 'Compound' ne soient pas récursives.

Tous les attributs du CIM sont implicitement facultatifs en ce sens que les profils utilisant le CIM peuvent les éliminer tous.

Les relations entre les classes révèlent la façon dont elles sont structurées les unes par rapport aux autres. Les classes CIM sont reliées de différentes façons, comme décrit en 4.3.2, 4.3.3 et 4.3.4.

4.3.2 Generalization (généralisation)

Une généralisation est une relation entre une classe générale et une classe plus spécifique. La classe la plus spécifique ne peut contenir que des informations supplémentaires. Par exemple, 'RegisteredGenerator' est une sous-classe spécifique de 'RegisteredResource'. La généralisation permet à une classe spécifique d'hériter d'attributs et de relations de toutes les classes plus générales situées au-dessus d'elle.

La Figure 3 est un exemple de généralisation. Dans cet exemple issu du paquetage 'MarketCommon', un 'MarketParticipant' est un type plus spécifique de 'Organisation'. 'Organisation' hérite également de 'IdentifiedObject'.

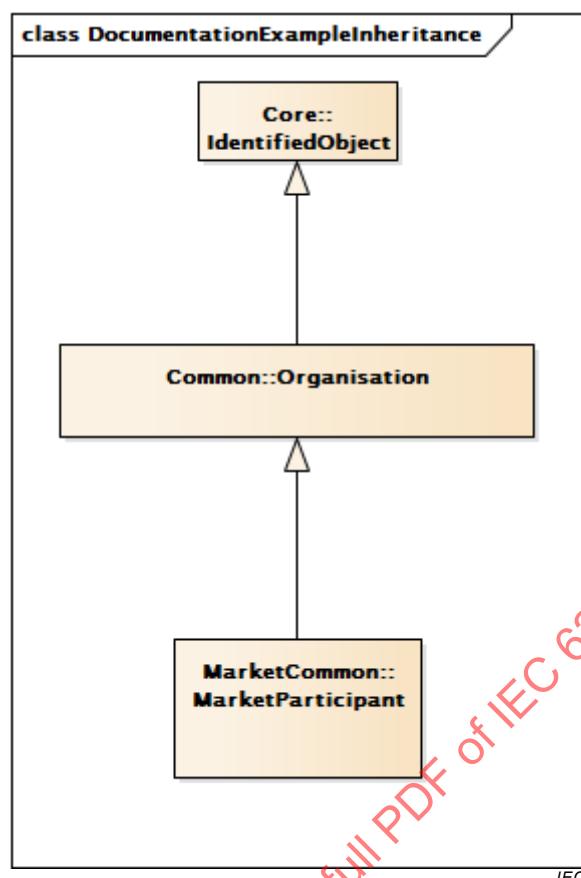


Figure 3 – Exemple de généralisation

4.3.3 Simple association (association simple)

Une association est une connexion conceptuelle entre des classes. Chaque association a deux "extrémités d'association". Les "extrémités d'association" étaient appelées "rôles" avant la spécification UML 2.0. Chaque extrémité d'association décrit le rôle que la classe cible (c'est-à-dire, la classe *vers* laquelle l'extrémité d'association part) a en relation avec la classe source (c'est-à-dire, la classe *à partir de* laquelle l'extrémité d'association part). La coutume est d'attribuer aux extrémités d'association le nom de la classe cible avec ou sans qualificatif (verbe, nom ou adverbe). Chaque extrémité d'association possède aussi une cardinalité/multiplicité, qui est une indication du nombre d'objets qui peuvent prendre part à la relation décrite. Dans le CIM, les associations ne sont pas nommées, seules les extrémités d'association le sont. Par exemple, dans le CIM, il existe une association entre un 'MarketParticipant' et un 'MarketRole' (voir la Figure 4, qui est issue du paquetage 'MarketCommon'). La multiplicité est représentée aux deux extrémités de l'association. Dans cet exemple, un objet 'MarketParticipant' peut faire référence à 0 ou à plusieurs objets 'MarketRole', et un 'MarketRole' peut être référencé dans 0 ou plusieurs objets 'MarketParticipant'.



Figure 4 – Exemple d'association simple

4.3.4 Aggregation (agrégation)

L'agrégation est un cas spécial d'association. L'agrégation indique que la relation entre les classes est une sorte de relation classe entière/classe partielle, dans laquelle la classe entière "consists of" (se compose de) ou "contains" (contient) la classe partielle et cette classe partielle est une "part of" (partie de) la classe entière. La classe partielle n'hérite pas de la classe entière comme dans la généralisation. La Figure 5 représente une agrégation entre la classe 'EnergyProfile' et la classe 'EnergyTransaction', qui est issue du paquetage 'ExternalInputs'. Elle indique également qu'un 'EnergyProfile' peut faire partie d'un seul objet 'EnergyTransaction', mais qu'un objet 'EnergyTransaction' peut contenir n'importe quel nombre d'objets 'EnergyProfile'. Dans le cadre de l'utilisation du CIM comme modèle d'information, l'agrégation n'a pas d'interprétation précise ou formelle au-delà d'une association simple, et est destinée à représenter visuellement une utilisation normale.

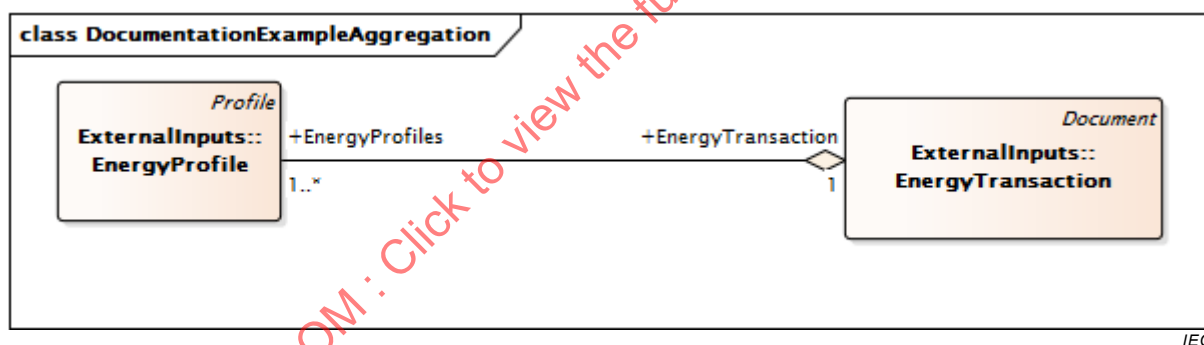


Figure 5 – Exemple d'agrégation

4.4 Concepts du modèle CIM et exemples

4.4.1 Paquetage 'MarketCommon'

Le modèle Common Market décrit les participants du marché ainsi que leurs rôles. Un participant du marché peut jouer plusieurs rôles dans un marché (voir Figure 6).

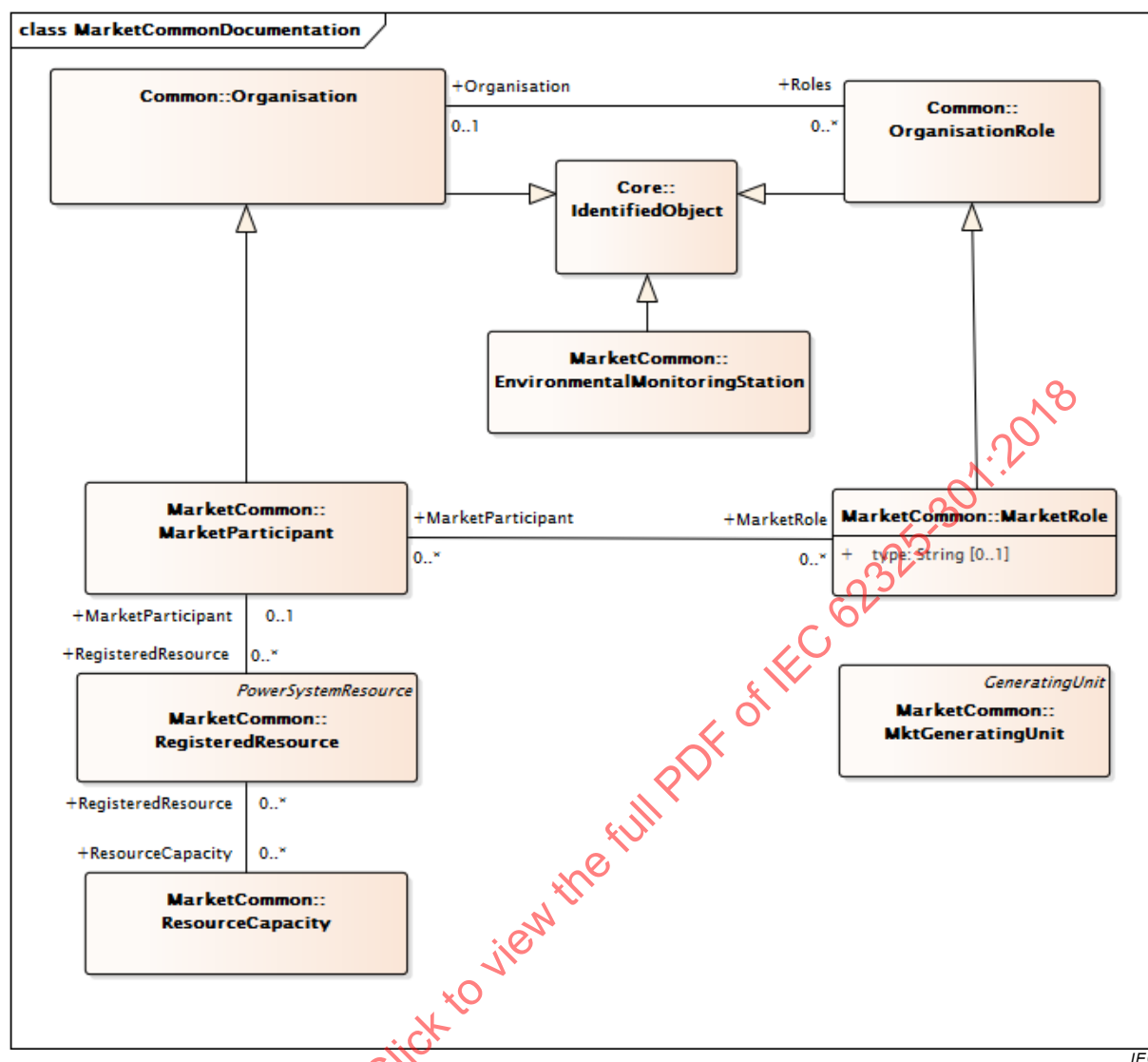


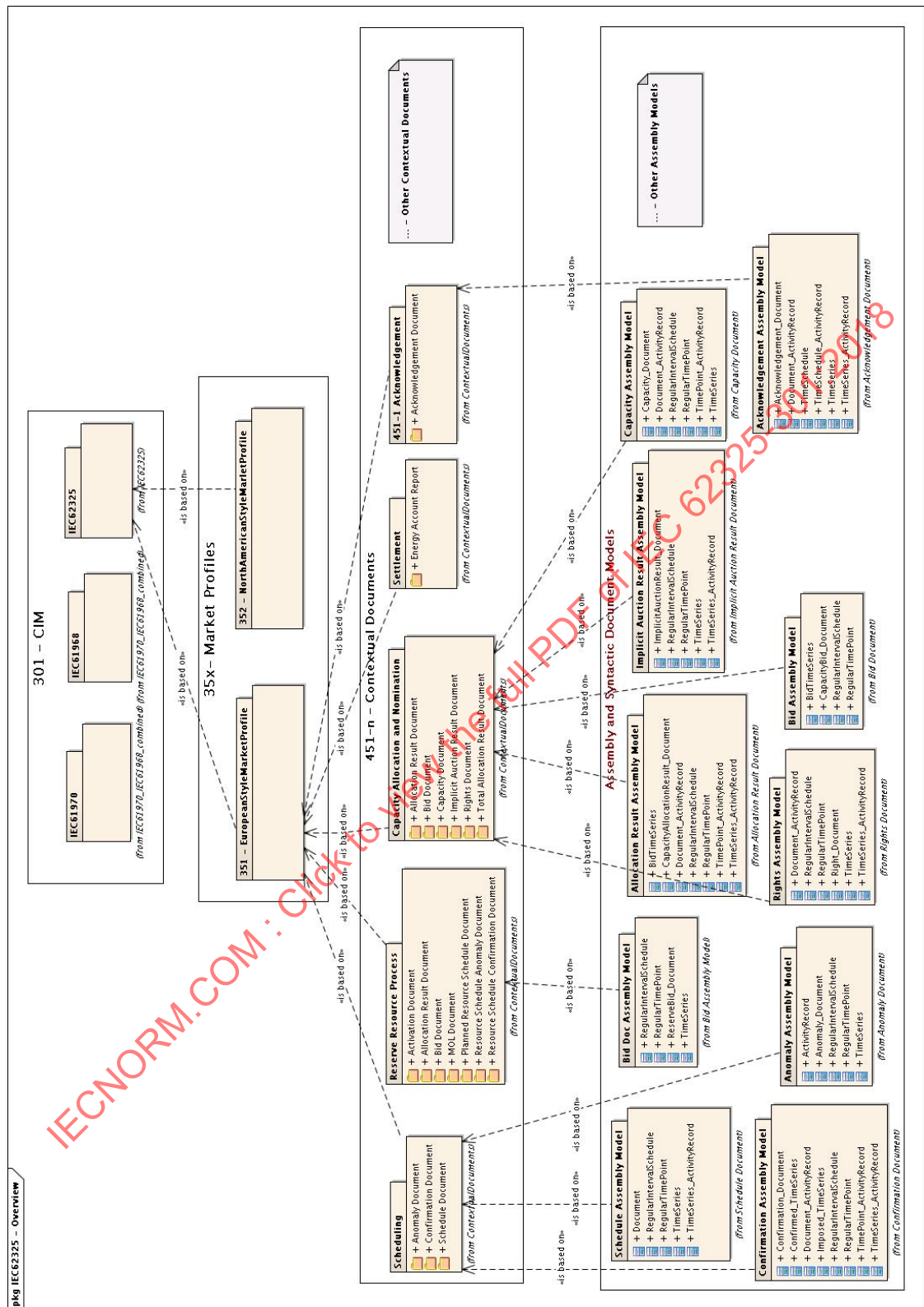
Figure 6 – Modèle Common Market

4.4.2 Paquetage 'MarketManagement'

Le modèle Market Management décrit un ensemble cohérent de classes à utiliser avec le modèle Common Market pour générer un profil. Le profil doit être utilisé lorsque le marché de l'électricité est principalement basé sur un accès réglementé de tiers au réseau, c'est-à-dire que les gestionnaires de réseaux de transport doivent donner aux fournisseurs d'électricité un accès non discriminatoire:

- au réseau de transport afin de leur permettre de fournir de l'énergie à leurs clients;
- à l'infrastructure qui permet l'échange d'énergie par les transactions de gros et de détail (bilatérales ou par le biais d'une installation d'échange d'énergie entre réseaux)

Le paquetage 'MarketManagement' fait référence à ce qui est ultérieurement appelé le marché de style européen (ESMP). La Figure 7 représente le cadre de modélisation en couches permettant la spécification des messages du CIM aux différentes couches. Ce cadre de modélisation définit la façon dont les concepts du paquetage 'MarketManagement' sont issus du CIM par le biais de la définition d'un profil de marché permettant la production de documents contextualisés pour l'échange d'informations.



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Légende

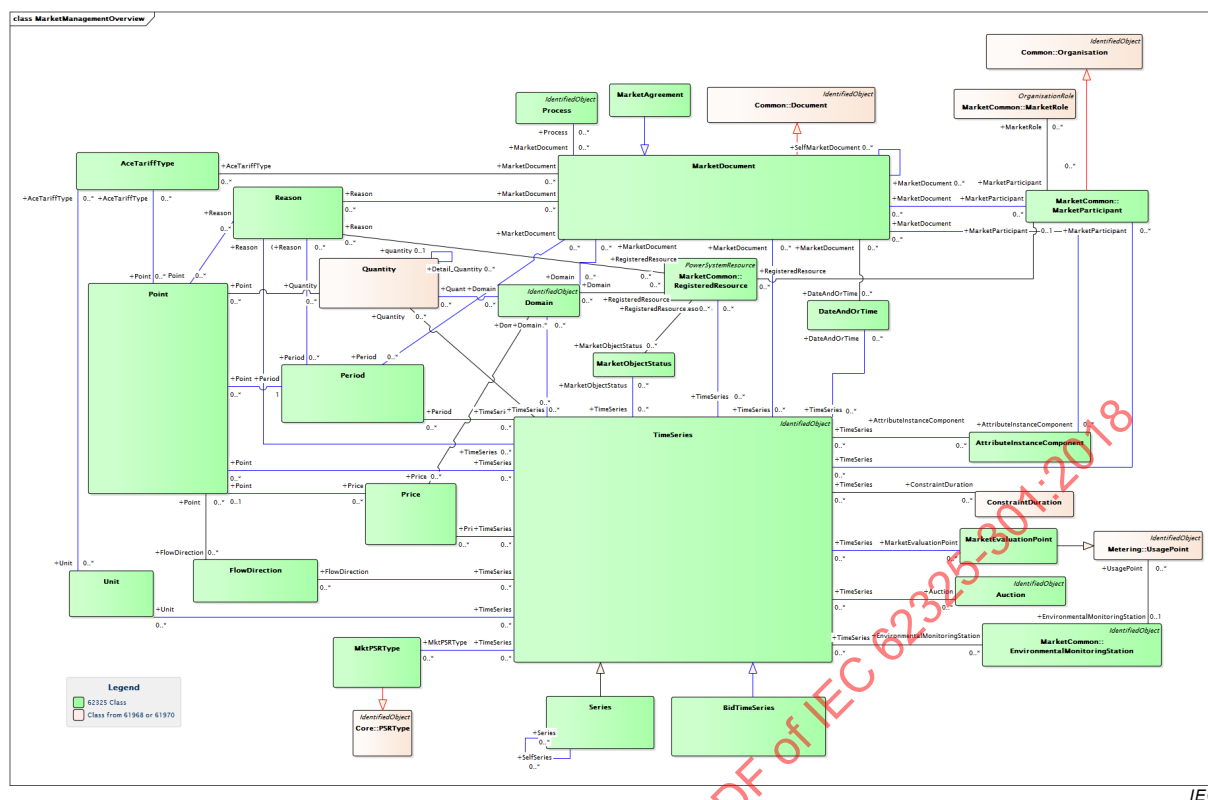
Anglais	Français
From IEC 61970_IEC 61968_combined	À partir de IEC 61970_IEC 61968_combined
From IEC 62325	À partir de IEC 62325
Is based on	Est basé sur

Anglais	Français
Market Profiles	Profils de marché
Contextual Documents	Documents contextuels
Assembly and Syntactic Document Models	Modèles de documents d'assemblage et de syntaxe
Other Contextual Documents	Autres documents contextuels
Other Assembly Models	Autres modèles d'assemblage
Scheduling	Programmation
Reserve Resource Process	Processus de ressources en réserve
Capacity Allocation and Nomination	Attribution de la capacité et désignation
Settlement	Règlement
451-1 Acknowledgement	451-1 Acknowledgement (Acquittement)
From Contextual Documents	À partir de Contextual Documents
Schedule Assembly Model	Modèle d'assemblage de programmation
Bid Doc Assembly Model	Modèle d'assemblage de document d'offre
Allocation Result Assembly Model	Modèle d'assemblage de résultat de l'attribution
Implicit Auction Result Assembly Model	Modèle d'assemblage de résultat des ventes aux enchères implicites
Capacity Assembly Model	Modèle d'assemblage de capacité
From Schedule Document	À partir du document de programme
From Bid Assembly Model	À partir du modèle d'assemblage d'offre
From Allocation Result Document	À partir du document de résultat de l'attribution
From Implicit Auction Result Document	À partir du document de résultat des ventes aux enchères implicites
From Capacity Document	À partir du document de capacité
Confirmation Assembly Model	Modèle d'assemblage de confirmation
Anomaly Assembly Model	Modèle d'assemblage d'anomalie
Rights Assembly Model	Modèle d'assemblage de droits
Bid Assembly Model	Modèle d'assemblage d'offre
Acknowledgement Assembly Model	Modèle d'assemblage d'acquittement
From Confirmation Document	À partir du document de confirmation
From Anomaly Document	À partir du document d'anomalie
From Rights Document	À partir du document de droits
From Bid Document	À partir du document d'offre
From Acknowledgement document	À partir du document d'acquittement

Figure 7 – Présentation du modèle Market Management

Comme indiqué dans la Figure 7, un jeu spécifique de documents contextualisés est fourni pour chaque processus métier nécessaire à l'exploitation d'un marché de l'électricité. Comme indiqué dans la Figure 7, les profils de marché sont spécifiés dans l'IEC 62325-351 et les documents contextualisés sont décrits dans les normes IEC 62325-451-1, IEC 62325-451-2, etc.

La Figure 8 représente les classes du paquetage 'MarketManagement'.



Anglais	Français
Legend	Légende
62325 Class	Classe 62325
Class from 61968 or 61970	Classe issue de 61968 ou 61970

Figure 8 – Modèle Market Management

Dans ce modèle Market Management, un rôle clé est donné au concept de 'MarketDocument', c'est-à-dire que les transactions du marché de l'électricité sont basées sur des échanges contractuels d'informations entre les participants du marché par le biais d'un jeu de documents donné en fonction du processus métier.

Comme indiqué dans la Figure 7, un jeu spécifique de documents contextualisés est fourni pour chaque processus métier nécessaire à l'exploitation d'un marché de l'électricité. À titre d'exemple, voici une liste non exhaustive des processus :

- processus d'acquittement: étant donné que l'échange d'informations est basé sur des échanges contractuels, il est exigé d'obtenir un acquittement fonctionnel du document échangé et pas seulement un acquittement technique;
- processus de programmation: ce processus décrit la façon d'échanger les informations relatives aux programmes (programmes de production, programmes de charge, programmes d'échanges commerciaux bilatéraux, programmes d'échange d'énergie entre réseaux, etc.);
- processus de règlement: ce processus décrit comment échanger les informations nécessaires au règlement du marché de l'électricité, c'est-à-dire, la comparaison entre l'énergie programmée et les compteurs relevés;
- processus d'attribution de la capacité de transport et de désignation: ce processus décrit les ventes aux enchères explicites et implicites de la capacité de transport dans le cadre du commerce transfrontalier. Il inclut également le marché secondaire des droits de capacité, c'est-à-dire la revente de droits de capacité;

- processus de ressources en réserve: ce processus décrit la programmation des ressources, c'est-à-dire les unités de production et la charge pouvant être répartie, et la vente aux enchères de la capacité et notamment l'activation par le gestionnaire de réseau de la réserve tertiaire à des fins d'équilibrage;
- etc.

La classe 'Process' (voir Figure 8) permet de définir, pour un document donné, le processus vers lequel le flux d'informations est dirigé. Par exemple, le Schedule Document peut être utilisé dans différents processus tels que "forecast", "long term", "day ahead", "intra day", etc.

Dans un 'MarketDocument', le concept 'TimeSeries' (voir Figure 9) basé sur les participants du marché (classe 'MarketParticipant') est également important, jouant un rôle (classe 'MarketRole') dans un processus métier du marché (classe 'Process') qui peuvent échanger des programmes de volume/prix relatifs à un domaine d'énergie (classe 'Domain') pour un type de métier donné (tel que le "commerce intérieur", le "commerce transfrontalier", la "réserve primaire", la "réserve secondaire", la "réserve tertiaire", etc.). Ces documents constituent la base sur laquelle sont fondés les échanges afin de gérer les échanges d'énergie, les offres, l'attribution de capacité, les ressources d'énergie en réserve et le règlement.

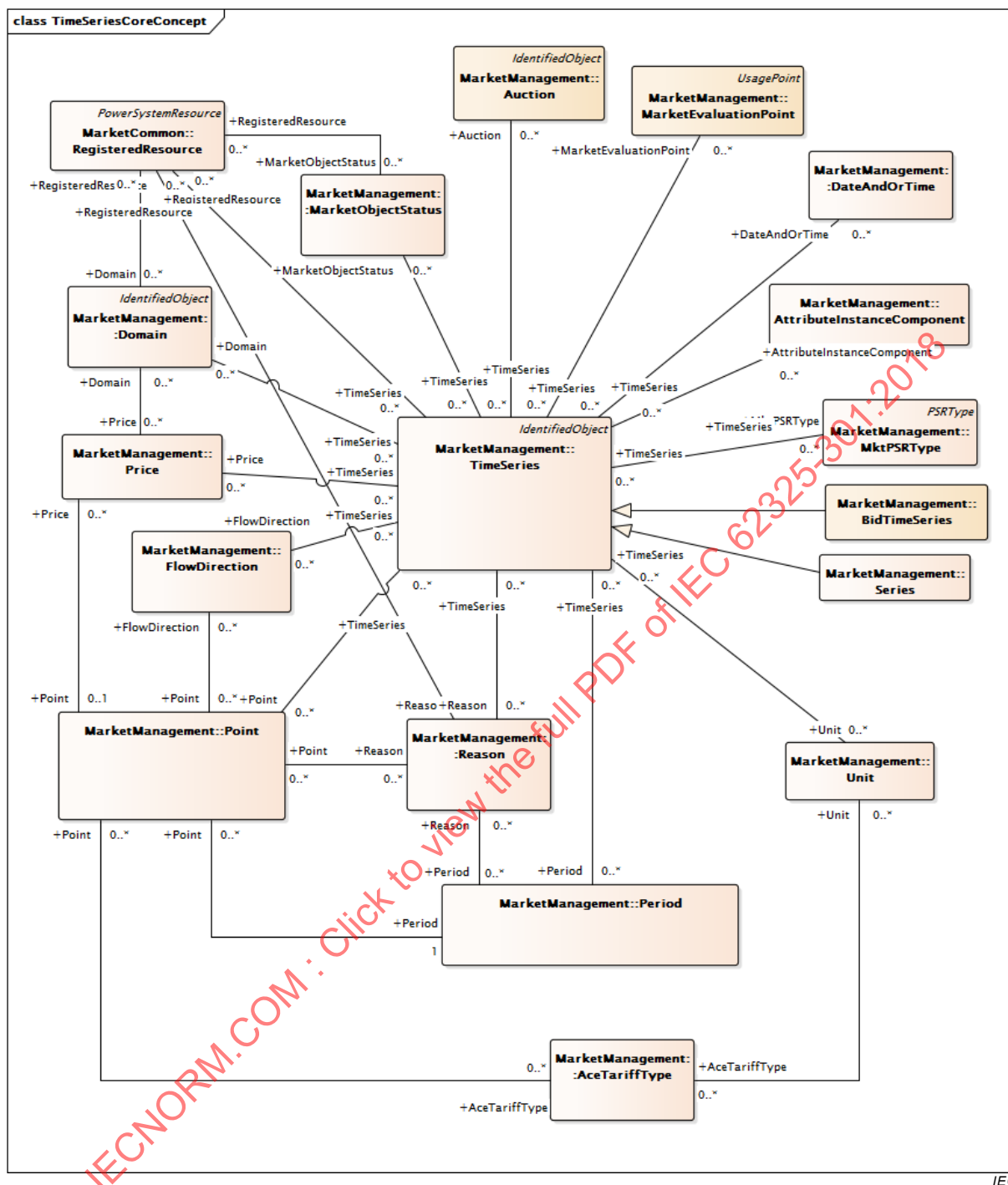


Figure 9 – Concept de base 'TimeSeries' 'MarketManagement'

Une spécialisation de la classe TimeSeries est définie afin de fournir une description appropriée de la configuration d'un objet de marché et de l'interrelation entre les objets du marché et les participants du marché. Cette classe est appelée Series.

Pour gérer les quantités et les prix de manière contractuelle dans le marché de l'électricité, les attributs de type 'Decimal' ont été intégrés au processus de modélisation.

4.4.3 Paquetage 'MarketOperations'

4.4.3.1 Opérations du marché

Le paquetage 'MarketOperations' décrit un ensemble cohérent de classes à utiliser avec le modèle Common Market (et d'autres parties du CIM décrites dans les normes IEC 61970-301

et IEC 61968-11) pour générer un profil. Dans ce cas, le profil doit être utilisé pour le marché de l'électricité de style nord-américain principalement caractérisé par une gestion de la production à J-1 effectuée par un opérateur du marché, par un équilibrage intrajournalier et en temps réel par le biais d'un système de répartition central, et par le règlement selon les prix marginaux locaux (LMP).

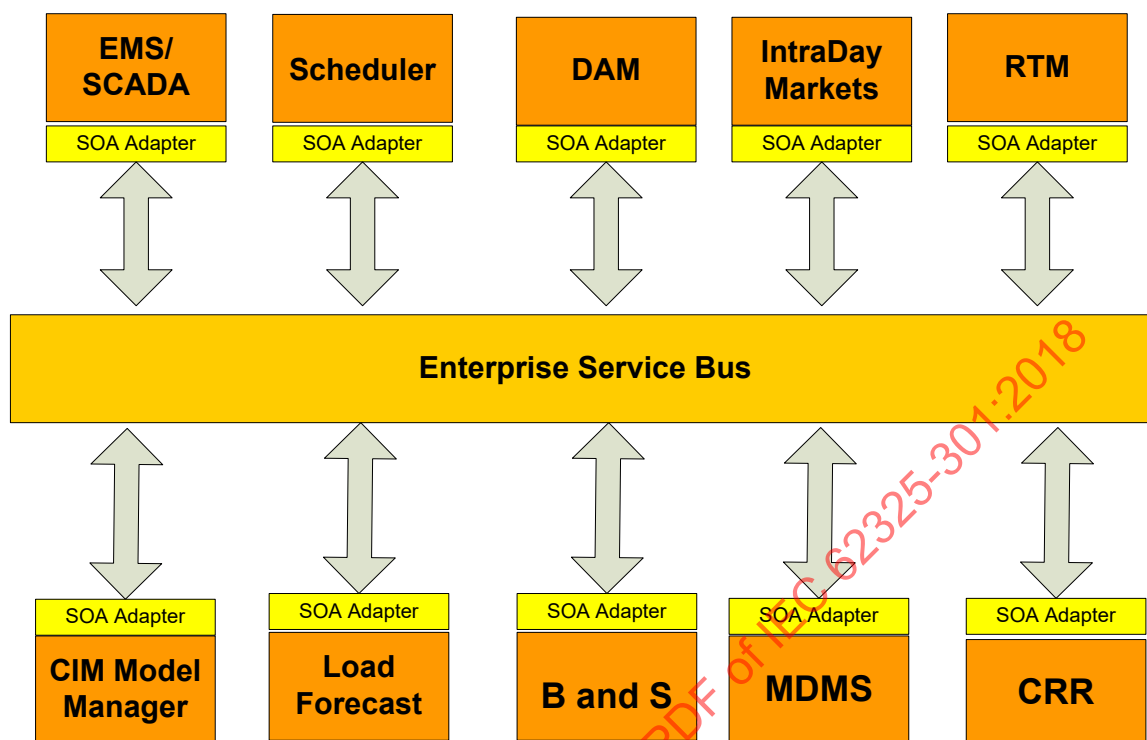
Le marché de l'électricité de style nord-américain inclut également la vente aux enchères des droits à revenu de congestion, qui sont des instruments financiers que les participants du marché achètent pour se couvrir des frais de congestion. Sont également inclus la gestion des données de compteur, la facturation et le règlement. Le paquetage 'MarketOperations' comprend des modèles prenant en charge ces caractéristiques.

Les Paragraphes 4.4.3.2 à 4.4.3.6 décrivent les principaux concepts référencés dans le paquetage 'MarketOperations'.

4.4.3.2 Systèmes informatiques d'un opérateur du marché

La Figure 10 représente les systèmes informatiques d'un opérateur type des marchés de l'électricité de style nord-américain qui sont référencés dans le paquetage 'MarketOperations'. L'opérateur du marché peut également être un gestionnaire des réseaux de transport régionaux (RTO – Regional Transmission Operator) ou un gestionnaire de réseau indépendant (ISO – Independent System Operator). Ces systèmes informatiques sont identifiés comme suit:

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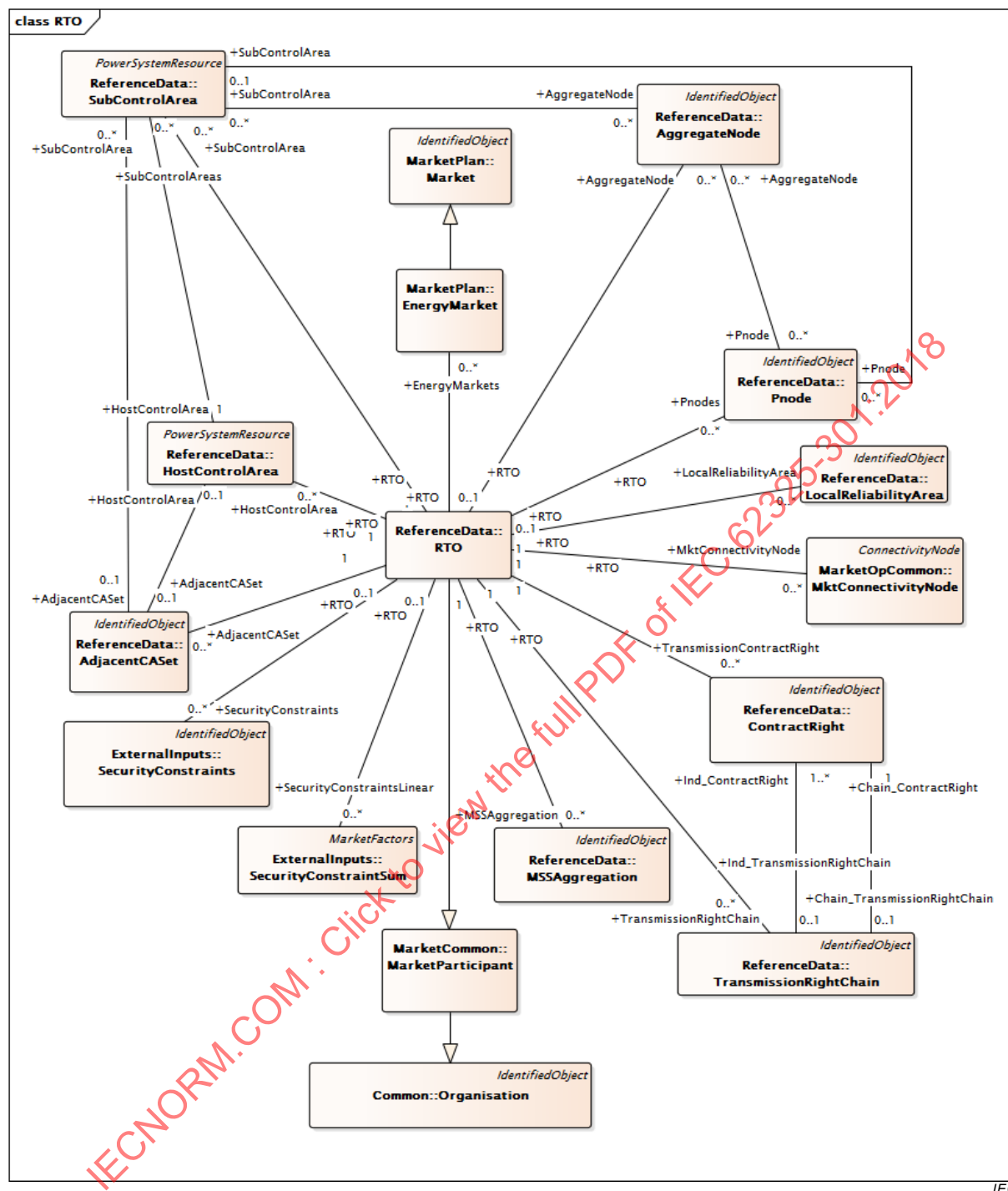
Légende

Anglais	Français
Scheduler	Programmeur
IntraDay Markets	Marchés intrajournaliers
SOA Adapter	Adaptateur SOA
Enterprise Service Bus	Bus de service d'entreprise

Figure 10 – Systèmes informatiques de l'opérateur d'un marché de l'électricité de style nord-américain

4.4.3.3 Interfaces du gestionnaire des réseaux de transport régionaux

La Figure 11 donne une vue d'ensemble du modèle d'interface UML d'un gestionnaire des réseaux de transport régionaux (RTO) capable de prendre en charge les interfaces de la Figure 10. Les principales classes sont brièvement résumées: les classes 'AggregateNode' et 'Pnode' sont utilisées afin de modéliser les nœuds de tarification pour lesquels les prix marginaux locaux sont calculés selon une moyenne pondérée. La classe 'LocalReliabilityArea' est utilisée pour identifier et modéliser les poches de charge dans le RTO. La classe 'MktConnectivityNode' est utilisée pour étendre la classe 'ConnectivityNode' de l'IEC 61970 avec les données du marché. Les classes 'TransmissionRightChain', 'ContractRight' et 'MSSAggregation' permettent de modéliser les contrats existants afin d'utiliser le réseau de transport et de représenter les droits de propriété de transport maintenus en vertu d'une clause d'antériorité. Les classes 'Organisation' et 'MarketParticipant' identifient le RTO. Les classes 'SecurityConstraints' et 'SecurityConstraintSum' sont utilisées pour représenter les contraintes du système, telles que les nomogrammes qui sont proches des contraintes de stabilité transitoire. Les classes 'HostControlArea', 'SubControlArea' et 'AdjacentCASet' sont utilisées pour modéliser les données et prendre en charge les opérations des zones de commande. Les modèles de ressource et les données du propriétaire de transport participant sont inclus dans leurs classes associées. Pour plus de détails sur le modèle RTO, voir l'Article 6.



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4.4.3.4 Modèle Resource

La Figure 12 donne un aperçu de haut niveau du modèle UML qui prend en charge les données du modèle de ressource du marché de l'électricité de style nord-américain. La classe 'RegisteredResource' est une classe parent qui présente les sous-classes suivantes: 'RegisteredLoad', 'RegisteredInterTie', 'RegisteredGenerator' et 'RegisteredDistributedResource'. Elle est associée aux classes 'AggregateNode', 'Pnode' et 'MktConnectivityNode' afin de prendre en charge les ressources agrégées et physiques. Les associations avec 'AggregateNode' et 'AggregatedPnode' (l'association est héritée de 'Pnode') prennent en charge la définition des ressources agrégées sur la base d'un nœud agrégé ou d'un nœud de tarification agrégé. Les associations avec 'IndividualPnode' (héritées de

'Pnode') et 'MktConnectivityNode' prennent en charge la définition des ressources physiques sur la base d'un nœud de tarification ou de connectivité.

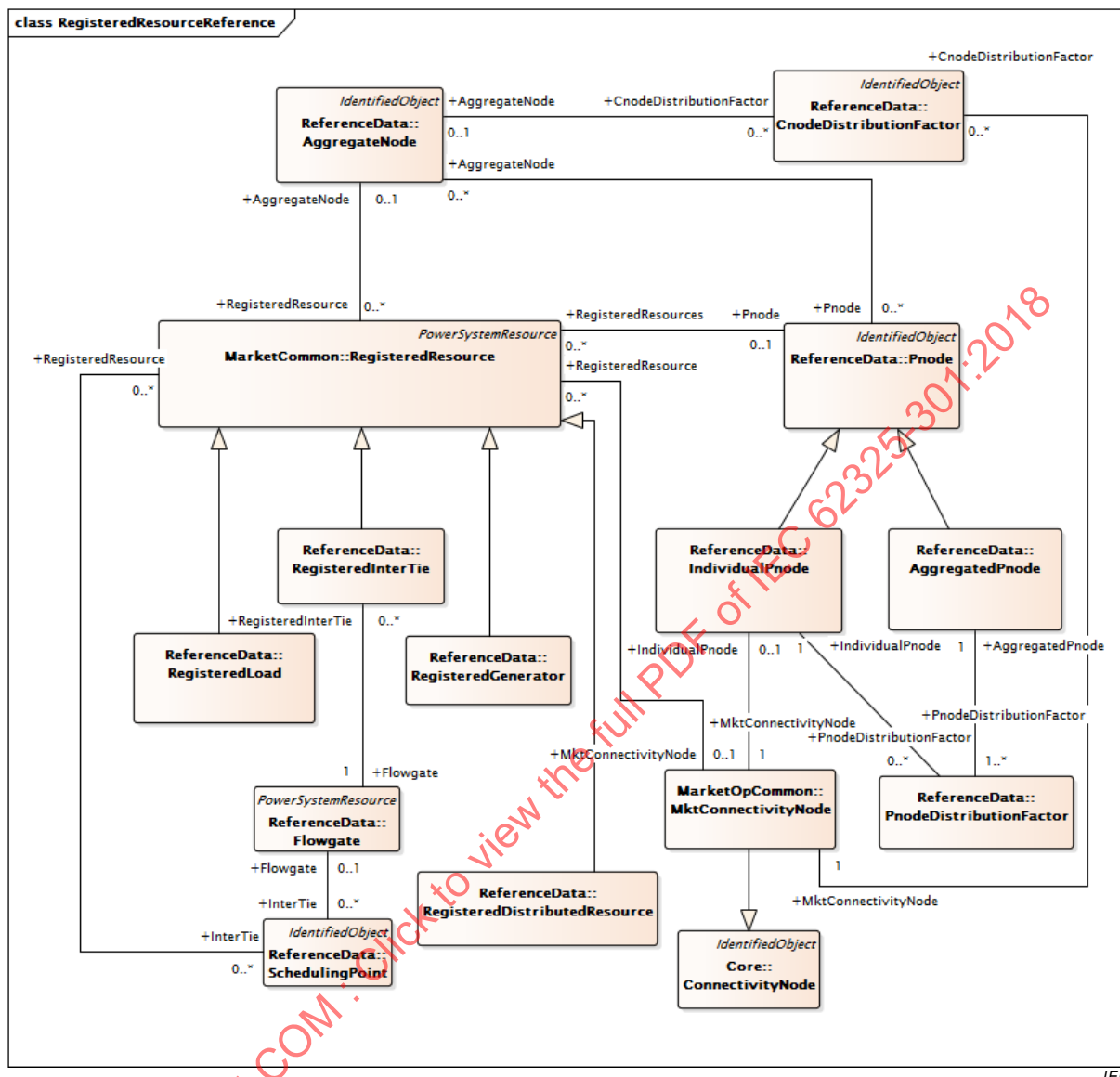


Figure 12 – Définition de référence de RegisteredResource pour le marché de l'électricité de style nord-américain

4.4.3.5 Modèle Bid/Offer

Les marchés de l'électricité de style nord-américain sont basés sur des offres de vente et d'achat de produits d'électricité qui sont négociées par un opérateur du marché soumis aux contraintes du réseau et des ressources. Les enchères et les offres comprennent des paires de grandeurs de prix et des données techniques relatives à la capacité du participant du marché à fournir les produits mentionnés.

La Figure 13 donne une vue d'ensemble des classes et des associations qui sont utilisées pour modéliser les offres de vente et d'achat. Le terme "offre" ("bid") inclut les offres de vente et d'achat d'un ou plusieurs produits d'électricité. La classe 'Bid' est une sous-classe de la classe 'Document' du paquetage 'IEC 61968'. Les Bid sont elles-mêmes classées en 'ResourceBid' et 'TransactionBid'. Les 'ResourceBid' sont des offres basées sur des ressources physiques (ou virtuelles) qui sont situées dans la zone de couverture du RTO, c'est-à-dire directement sous le contrôle opérationnel du RTO. Les 'TransactionBid' sont des accords bilatéraux conclus entre les participants du marché, qui sont mentionnés au RTO

comme étant des contraintes dans la mise en équilibre du marché. Le RTO décide si les accords bilatéraux peuvent être conclus dans le respect des normes de fiabilité du système.

Les offres sont associées aux participants du marché. Les coordinateurs de programmation remplissent un rôle spécifique de participant du marché qui envoie les offres au nom des participants du marché. Chaque classe 'Bid' doit être associée à une classe 'MarketParticipant'. Cette classe 'MarketParticipant' peut être représentée par un 'SchedulingCoordinator' étant donné que 'SchedulingCoordinator' hérite de 'MarketParticipant'.

La classe 'Bid' est reliée à la classe 'BidProduct' et aux classes 'MarketProduct'. Ces associations sont utilisées pour modéliser les offres relatives aux services énergétiques et auxiliaires. Une autre association entre la classe 'Bid' et la classe 'Market' indique le marché visé par l'offre (J-1, temps réel, etc.).

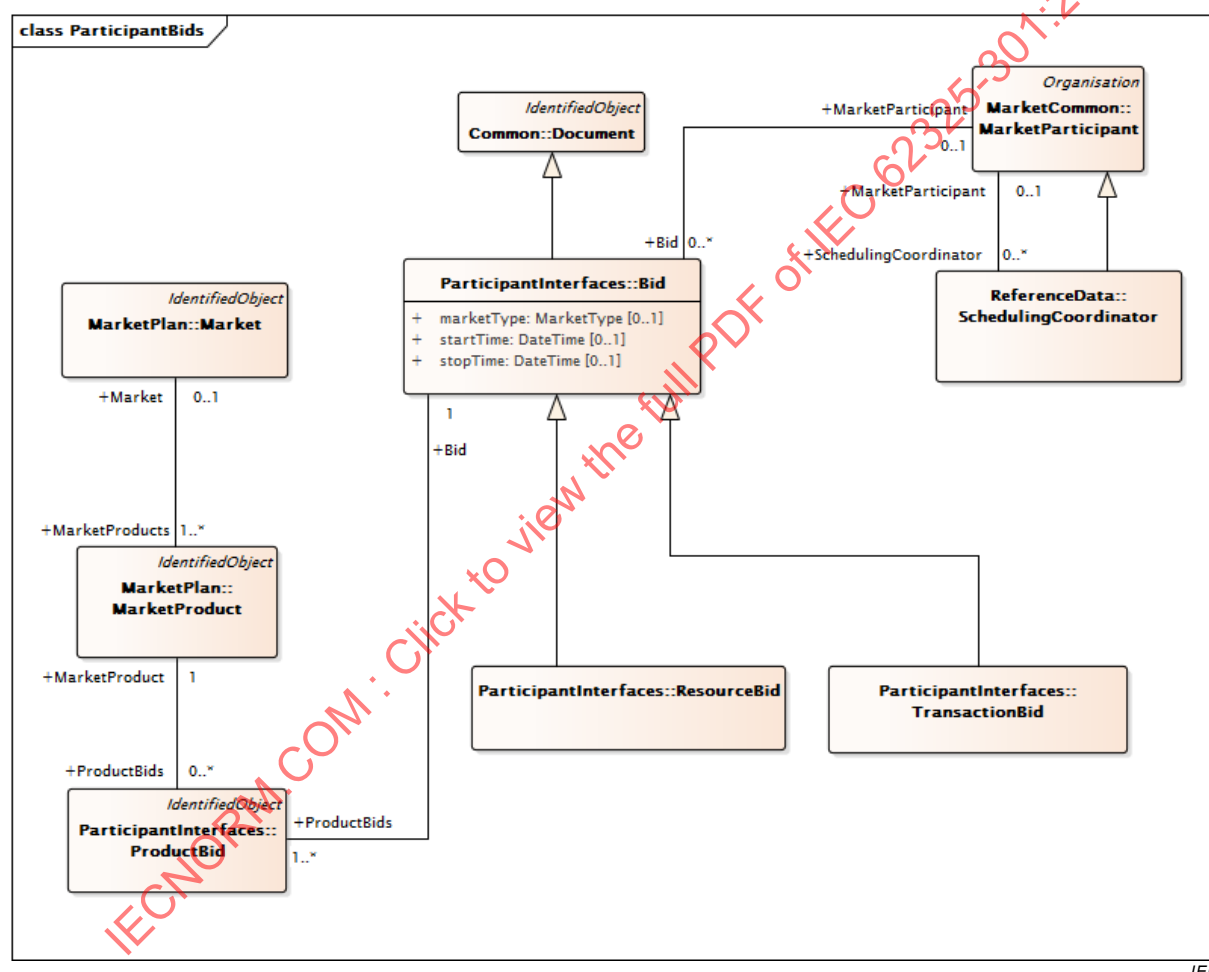


Figure 13 – Définition de l'offre pour le marché de l'électricité de style nord-américain

La Figure 14 donne des détails supplémentaires sur les offres d'achat/de vente.

La classe 'Bid' est associée à la classe 'ProductBid', qui est elle-même associée à la classe 'BidPriceSchedule'. La classe 'BidPriceSchedule' définit des programmes d'offre pour autoriser une offre de produit à utiliser des courbes de prix d'offre spécifiques sur plusieurs intervalles de temps. Cela simplifie la modélisation des offres qui sont effectuées sur des périodes couvrant plusieurs intervalles. Le programme d'offre est l'ensemble d'intervalles consécutifs pour lequel l'offre est valide.

Une offre peut également être un programme individuel indiquant que le participant du marché aimerait exploiter les ressources d'après un programme spécifique (par exemple, un

programme minimum). L'opérateur du marché détermine si les ressources peuvent fonctionner avec le programme individuel envoyé tout en satisfaisant aux critères de fiabilité du système. Ces programmes individuels sont établis aux prix marginaux locaux (LMP) déterminés pendant la mise en équilibre du marché. La classe 'Bid' est associée à la classe 'ProductBid', qui est associée à la classe 'BidSelfSchedule' pour prendre en charge la modélisation des programmes individuels. La classe 'BidSelfSched' est associée à la classe 'ContractRight', qui peut être utilisée pour modéliser l'utilisation de contrats existants afin de prendre en charge les programmes individuels.

Ce modèle prend également en charge les offres dont une partie est classée comme programme individuel et l'autre partie comme offre ordinaire.

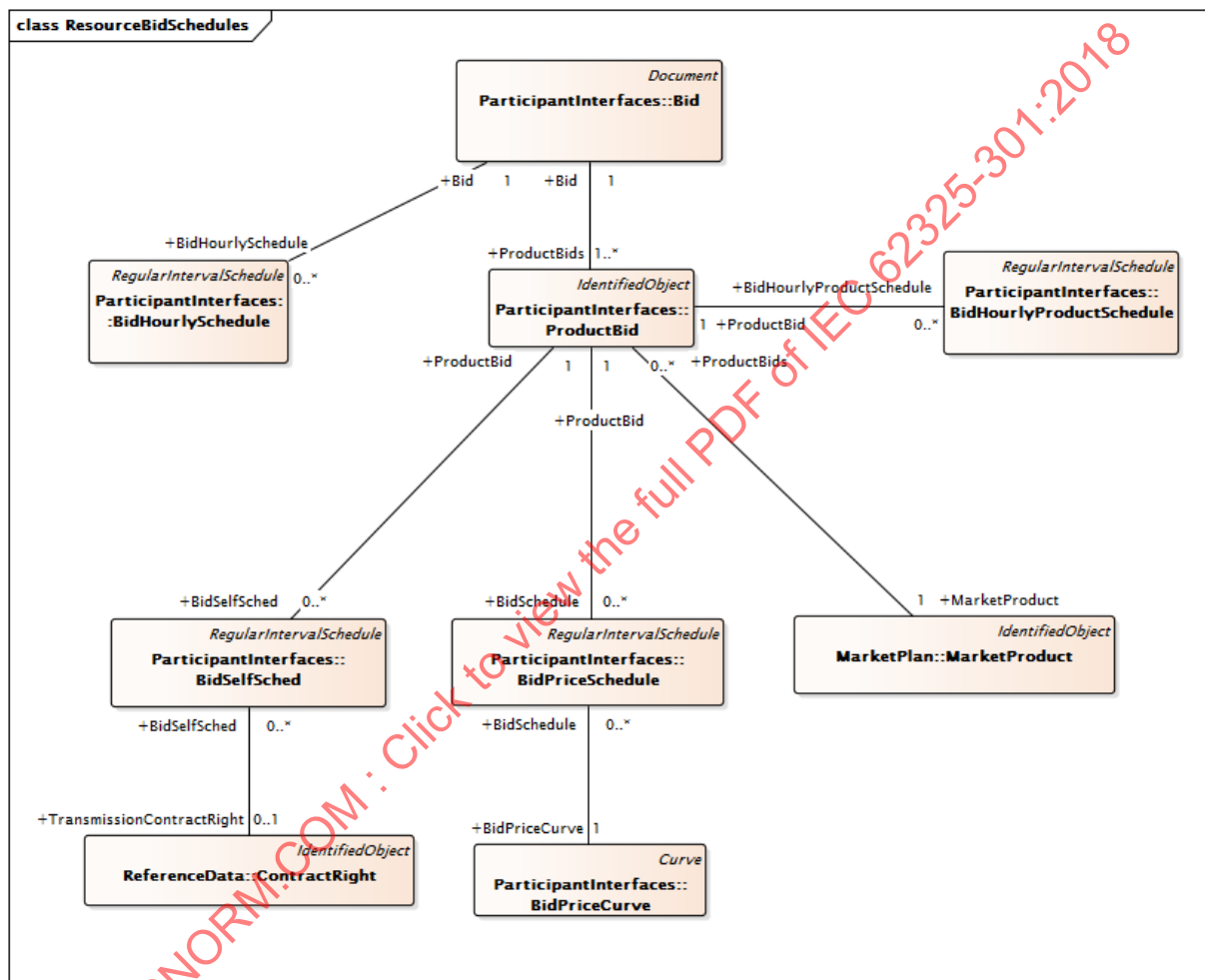


Figure 14 – Définitions des programmes d'offre des ressources pour le marché de l'électricité de style nord-américain

4.4.3.6 Résultats d'équilibre du marché

La Figure 15 représente les principales classes utilisées pour communiquer les résultats du processus d'ajustement d'un marché de l'électricité de style nord-américain. La classe 'Market' est utilisée pour modéliser le type de marché (J-1, temps réel ou intrajournalier). La classe 'MarketFactors' est utilisée pour modéliser l'horizon temporel du marché. La classe 'LossClearing' est utilisée pour modéliser les pertes électriques pendant l'horizon temporel du marché. La classe 'GeneralClearing' est utilisée pour modéliser l'identité de l'intervalle du marché. La classe 'PnodeClearing' et ses associations sont utilisées pour modéliser les prix d'équilibre (prix marginaux locaux) du processus. La classe 'ResourceClearing' est utilisée pour modéliser les résultats d'équilibre du marché en fonction des ressources. La classe 'AncillaryServiceClearing' est utilisée pour modéliser les résultats de l'équilibre des services auxiliaires en fonction des régions du marché. La

classe 'ResourceAwardClearing' est utilisée pour modéliser d'autres informations sur l'équilibre des ressources. La classe 'ConstraintClearing' est utilisée pour modéliser l'échange de données selon des contraintes avec obligation dans la solution optimale d'équilibre du marché.

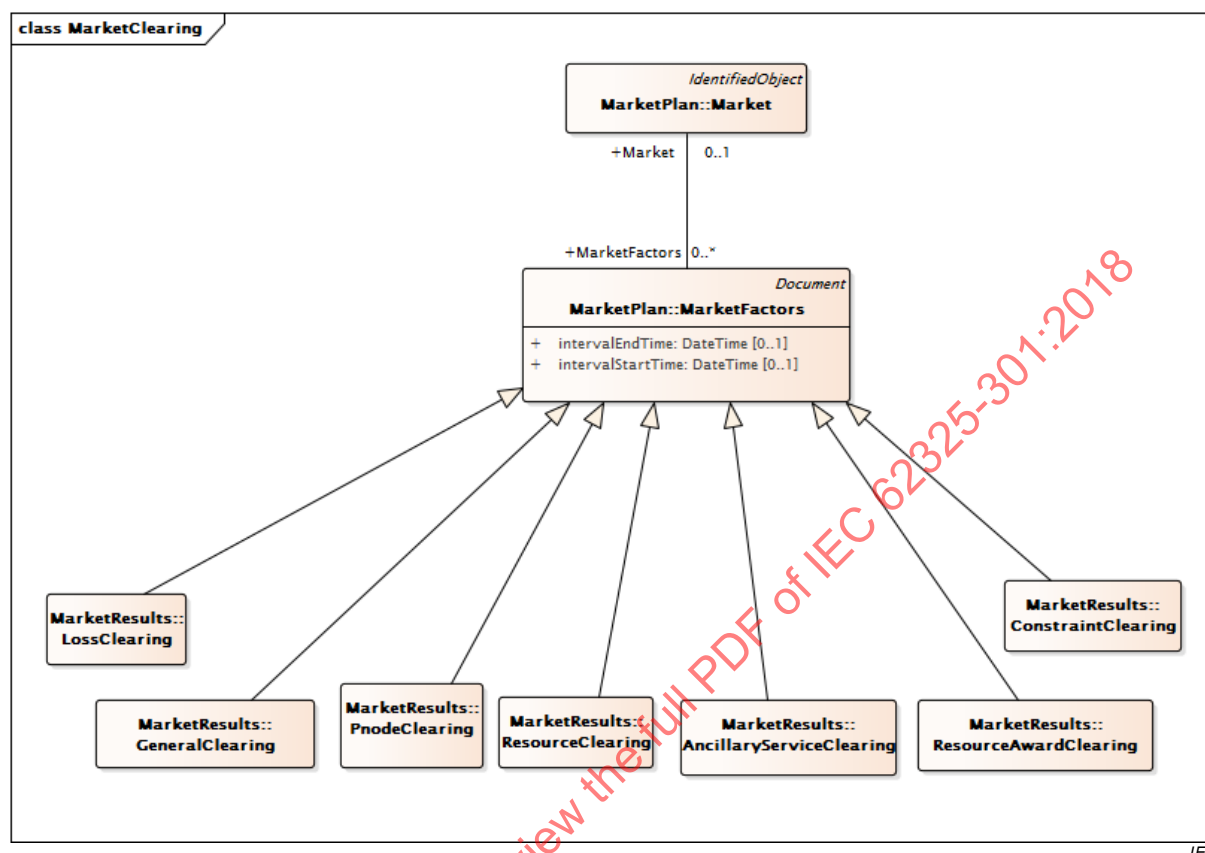


Figure 15 – Équilibre du marché de l'électricité de style nord-américain

4.4.3.7 Communication côté demande

La Figure 16 représente les principales classes utilisées pour communiquer des informations entre les ressources côté demande (ressources de réponse à la demande, ressources de stockage, ressources de production de distribution, etc.) et les marchés. La classe 'RegisteredDistributedResource' est utilisée pour modéliser la ressource et constitue une nouvelle spécialisation de la classe 'RegisteredResource'. La classe 'ResourceCertification' est utilisée pour modéliser différents marchés ou services pour la fourniture desquels la ressource côté demande est qualifiée; par exemple, une ressource de réponse à la demande peut être qualifiée pour fournir 10 MWh d'énergie à une puissance de 10 MW tandis qu'une installation de stockage de 20 MWh peut être qualifiée pour fournir 10 MW de régulation (Regulation) à la hausse ou à la baisse.

La classe 'MarketActualEvent' a été étendue afin de modéliser les événements côté demande qui ont des heures de début et de fin ciblées, ainsi que des indicateurs 'eventType' et 'eventStatus' différents. La classe 'DistributedResourceActualEvent' est une spécialisation de 'MarketActualEvent' qui est utilisée pour la collecte des activités de réponse à la demande dans l'ensemble du système. L'extension de la classe 'Instructions' de façon à inclure un Dispatch Operating Delta (delta de répartition d'exploitation) constitue une autre amélioration importante du modèle lorsqu'une certaine quantité d'énergie est demandée (par opposition à ou en plus d'un point de consigne absolu d'énergie, ou d'une Dispatch Operating Target (cible de répartition d'exploitation), qui était déjà présent(e) dans le modèle).

Les performances d'une ressource côté demande sont enregistrées dans la classe 'ResourcePerformanceEvaluation' et peuvent être constituées d'une ou de plusieurs instances d'un 'ResourcePerformanceTimeSeriesFactor', telles que les relevés de compteurs, les

```

classDiagram
    class IdentifiedObject {
        <<abstract>>
    }
    class MarketPlan {
        <<abstract>>
    }
    class MarketResults {
        <<abstract>>
    }
    class MarketCommon {
        <<abstract>>
    }
    class MarketPlan_ {
        +MarketPlan::MarketActualEvent
    }
    class MarketResults_ {
        +ResourcePerformanceEvaluation
    }
    class MarketResults_ResourceDeploymentStatus {
        +ResourceDeploymentStatus
    }
    class MarketResults_ResourcePerformanceTimeSeriesFactor {
        +ResourcePerformanceTimeSeriesFactors
    }
    class MarketResults_ResourcePerformanceGlobalFactor {
        +ResourcePerformanceGlobalFactor
    }
    class MarketResults_Instructions {
        +Instructions
    }
    class MarketCommon_ {
        +RegisteredResource
    }
    class ReferenceData_ {
        +ResourceCertification
    }
    class MarketResults_ResourcePerformanceRating {
        +ResourcePerformanceRatings
    }
    IdentifiedObject <|-- MarketPlan
    IdentifiedObject <|-- MarketResults
    MarketPlan <|-- MarketPlan_
    MarketResults <|-- MarketResults_
    MarketResults <|-- MarketResults_ResourceDeploymentStatus
    MarketResults <|-- MarketResults_ResourcePerformanceTimeSeriesFactor
    MarketResults <|-- MarketResults_ResourcePerformanceGlobalFactor
    MarketResults <|-- MarketResults_Instructions
    MarketCommon <|-- MarketCommon_
    MarketPlan_ --> MarketPlan_ : +DemandResponseActualEvent 1
    MarketPlan_ --> MarketPlan_ : +ActualDemandResponseEvent 0..1
    MarketPlan_ --> MarketPlan_ : +InstructionClearing 0..*
    MarketResults_ --> MarketResults_ : +ResourcePerformanceEvaluations 0..*
    MarketResults_ --> MarketResults_ : +ResourcePerformanceEvaluation 1
    MarketResults_ --> MarketResults_ : +ResourcePerformanceTimeSeriesFactors 0..*
    MarketResults_ --> MarketResults_ : +ResourcePerformanceGlobalFactor 0..*
    MarketResults_ResourceDeploymentStatus --> MarketResults_ResourceDeploymentStatus : +ResourceDeploymentStatus 0..*
    MarketResults_ResourceDeploymentStatus --> MarketResults_ResourceDeploymentStatus : +InstructionClearing 0..1
    MarketResults_ResourcePerformanceTimeSeriesFactor --> MarketResults_ResourcePerformanceTimeSeriesFactor : +ResourcePerformanceTimeSeriesFactors 0..*
    MarketResults_ResourcePerformanceGlobalFactor --> MarketResults_ResourcePerformanceGlobalFactor : +ResourcePerformanceGlobalFactor 0..*
    MarketResults_Instructions --> MarketResults_Instructions : +Instructions 1..*
    MarketResults_Instructions --> MarketResults_Instructions : +Instructions 0..*
    MarketCommon_ --> MarketCommon_ : +RegisteredResource 1
    MarketCommon_ --> MarketCommon_ : +ResourceAvailabilityServiceQualification 0..*
    ReferenceData_ --> ReferenceData_ : +ResourceCertification 0..*
    MarketResults_ResourcePerformanceRating --> MarketResults_ResourcePerformanceRating : +ResourcePerformanceRatings 0..*
    MarketPlan_ --> MarketResults_ : +DemandResponseActualEvent 1
    MarketResults_ --> MarketPlan_ : +ActualDemandResponseEvent 0..1
    MarketResults_ResourceDeploymentStatus --> MarketResults_ResourceDeploymentStatus : +ResourceDeploymentStatus 0..*
    MarketResults_ResourcePerformanceTimeSeriesFactor --> MarketResults_ResourcePerformanceTimeSeriesFactor : +ResourcePerformanceTimeSeriesFactors 0..*
    MarketResults_ResourcePerformanceGlobalFactor --> MarketResults_ResourcePerformanceGlobalFactor : +ResourcePerformanceGlobalFactor 0..*
    MarketResults_Instructions --> MarketResults_Instructions : +Instructions 1..*
    MarketCommon_ --> MarketCommon_ : +RegisteredResource 1
    ReferenceData_ --> ReferenceData_ : +ResourceCertification 0..*
    MarketResults_ResourcePerformanceRating --> MarketResults_ResourcePerformanceRating : +ResourcePerformanceRatings 0..*
    
```

The diagram illustrates the structure of the `RegisteredDistributedResource` class and its associated classes. The `RegisteredDistributedResource` class is an abstract class that defines the following attributes and methods:

- `+RegisteredResource` (1)
- `+ResourceAvailabilityServiceQualification` (0..*)
- `+ResourcePerformanceRatings` (0..*)

The `RegisteredDistributedResource` class is implemented by the following classes:

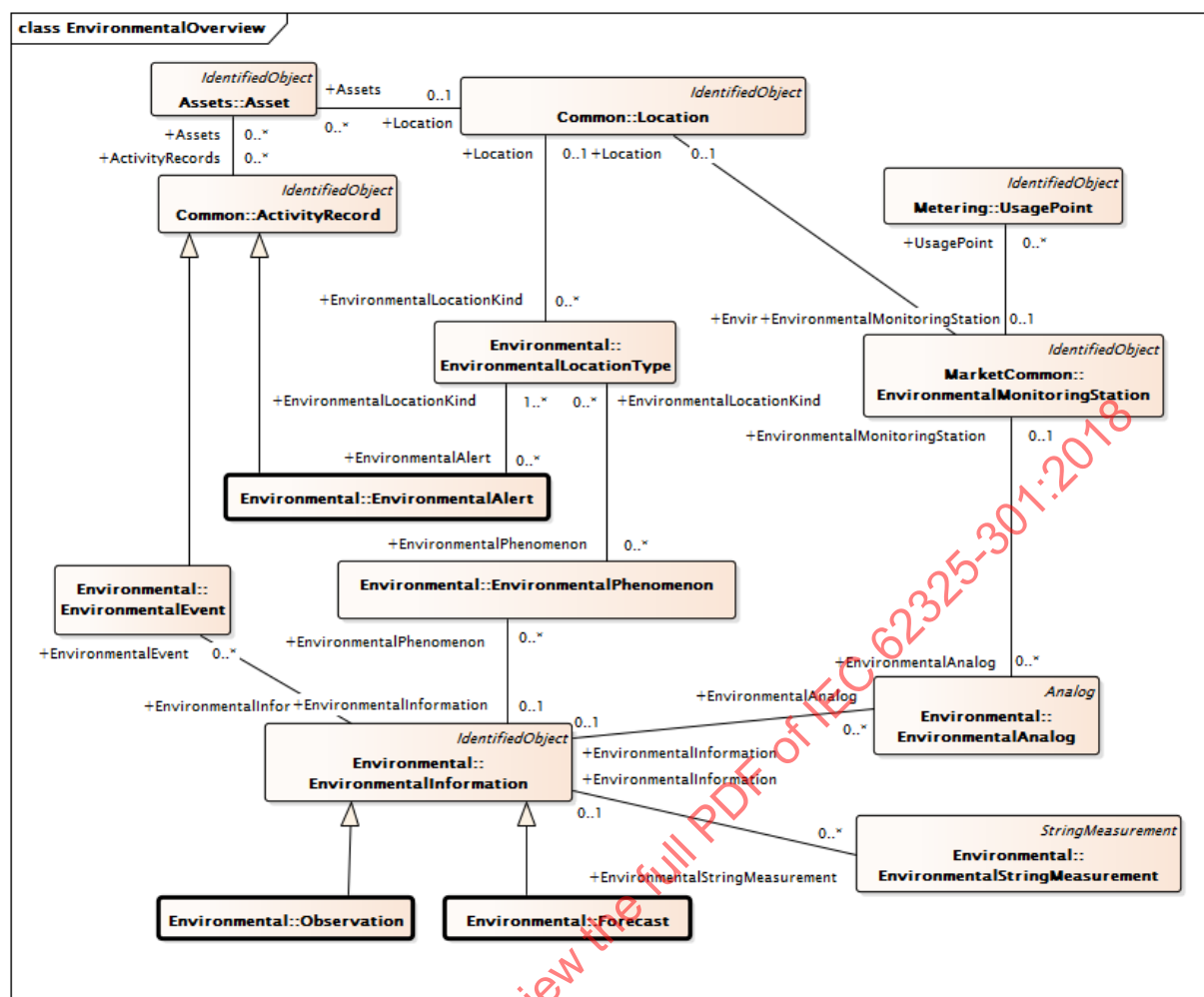
- `MarketPlan::MarketActualEvent` (1)
- `MarketResults::ResourcePerformanceEvaluation` (0..*)
- `MarketResults::ResourcePerformanceTimeSeriesFactor` (0..*)
- `MarketResults::ResourcePerformanceGlobalFactor` (0..*)
- `MarketResults::Instructions` (1..*)
- `MarketCommon::RegisteredResource` (1)
- `ReferenceData::ResourceCertification` (0..*)
- `MarketResults::ResourcePerformanceRating` (0..*)

The diagram also shows the relationships between these classes, including the `+DemandResponseActualEvent` and `+ActualDemandResponseEvent` associations.

Figure 16 – Communication côté demande pour le marché de l'électricité de style nord-américain

4.4.4 Données environnementales

La Figure 17 donne une vue d'ensemble du paquetage 'Environmental', qui comporte un modèle d'éléments généralement utilisés pour décrire les conditions environnementales (météorologiques), y compris les prévisions, les observations, les mesures, les phénomènes, les alertes et les événements.

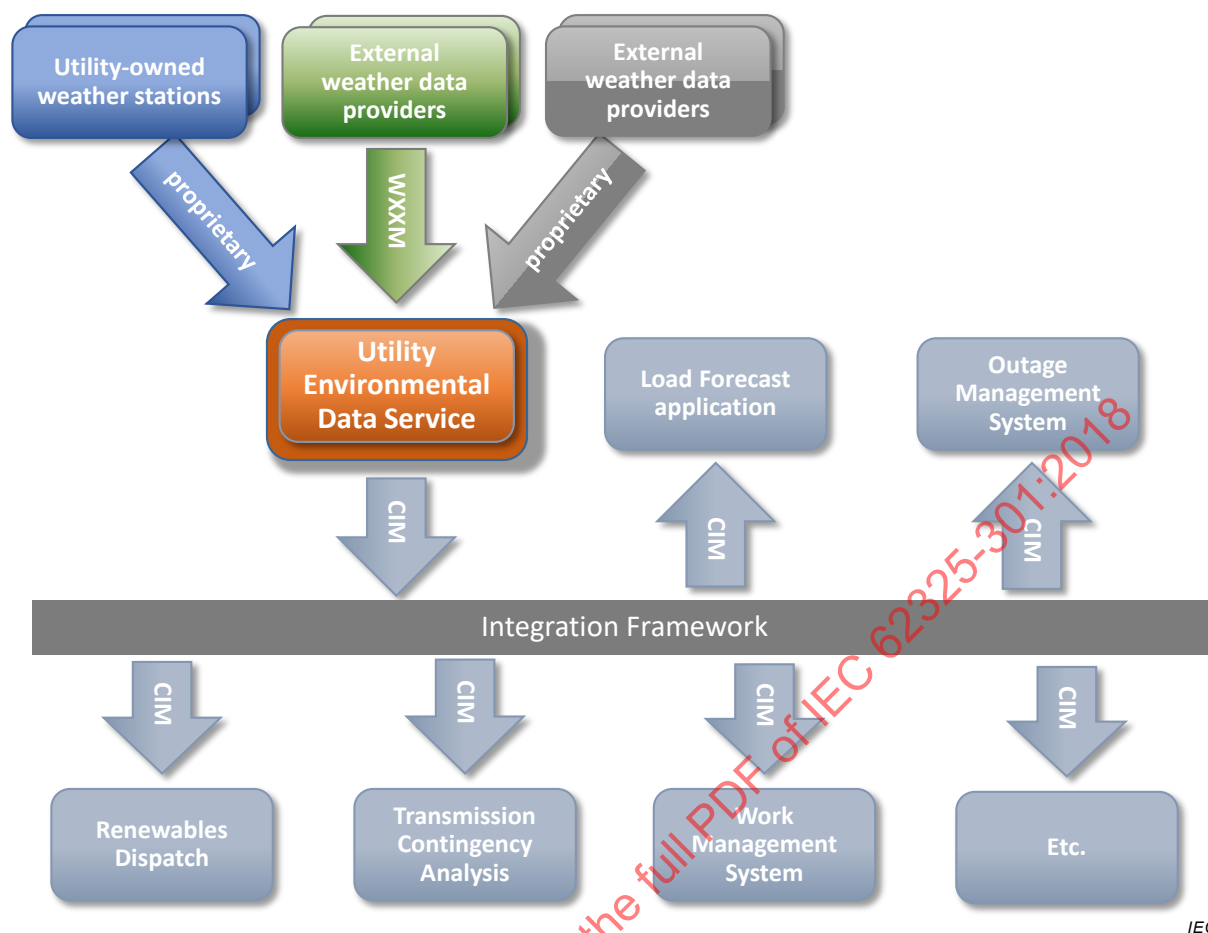


IEC

Figure 17 – Principales classes environnementales

Les données environnementales sont utilisées par une grande variété de systèmes et d'applications au sein de l'industrie électrique, de la gestion des opérations et du patrimoine aux aspects juridiques et relatifs à la facturation du client. Il est essentiel que le comportement des marchés et des activités soit aussi varié que la prévision de la charge et de la production, le rétablissement par suite d'une tempête (déploiement préalable du personnel, évaluation des dommages, rétablissement) et réponde aux événements environnementaux (feux de forêt/prairie, inondations, tsunamis), à la surveillance d'émissions, à la surveillance des courants induits géomagnétiquement et aux enquêtes menées dans le cadre de réclamations par suite d'accidents.

Les classes du paquetage Environmental sont destinées à prendre en charge l'échange d'informations sur les données environnementales au sein d'une entreprise de distribution d'électricité, ainsi qu'à simplifier l'association des données environnementales à d'autres informations d'entreprises de distribution d'électricité (emplacement, patrimoine, point d'usage) auxquelles ces données peuvent être naturellement liées. Comme représenté dans la Figure 18, un service de données environnementales d'entreprise de distribution d'électricité (Utility Environmental Data Service) joue un rôle majeur dans les cas d'utilisation de l'échange de données environnementales au sein de l'entreprise. Le service de données environnementales reçoit des données provenant de différentes sources externes (de différents formats), stocke et gère ces données dans le temps et les fournit, comme exigé, à une grande variété d'applications consommatrices au sein de l'entreprise.

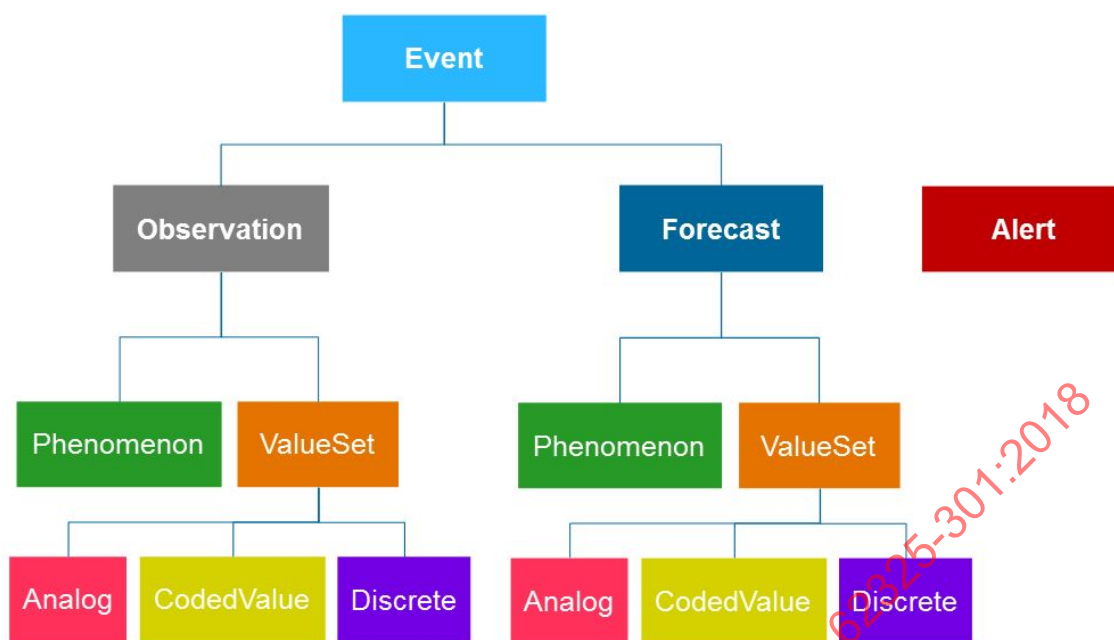


IEC

Anglais	Français
Utility-owned weather stations	Stations météorologiques appartenant à l'entreprise
External weather data providers	Fournisseurs externes de données météorologiques
Proprietary	Propriétaire
Utility environmental data service	Service de données environnementales d'entreprise de distribution d'électricité
Load forecast application	Application de prévision de charge
Outage management system	Système de gestion des indisponibilités
Integration framework	Cadre d'intégration
Renewables dispatch	Répartition des énergies renouvelables
Transmission contingency analysis	Analyse de contingence du transport
Work management system	Système de gestion des travaux

Figure 18 – Service de données environnementales de l'entreprise de distribution d'électricité

Comme représenté dans la Figure 19, les quatre éléments de niveau supérieur des données environnementales sont l'observation, la prévision, l'alerte et l'événement. Ces éléments sont représentés par les classes 'Observation', 'Forecast', 'EnvironmentalAlert' et 'EnvironmentalEvent', respectivement. 'Forecast' et 'Observation' sont des classes enfants de 'EnvironmentalInformation' et l'organisation des données appartenant à ces classes est identique.



IEC

Anglais	Français
Event	Événement
Forecast	Prévision
Alert	Alerte
Phenomenon	Phénomène
Analog	Grandeur analogique
Discrete	Grandeur discrète

Figure 19 – Éléments de niveau supérieur des données environnementales

Comme représenté dans la Figure 20, chaque observation ou prévision est créée à un certain moment, peut avoir un fournisseur et comporte un nombre quelconque de valeurs de mesure et de descriptions de phénomènes. En outre, une prévision n'est valide qu'au cours d'une certaine période. Les informations de localisation relatives aux prévisions et aux observations sont fournies au niveau de la mesure ou du phénomène.

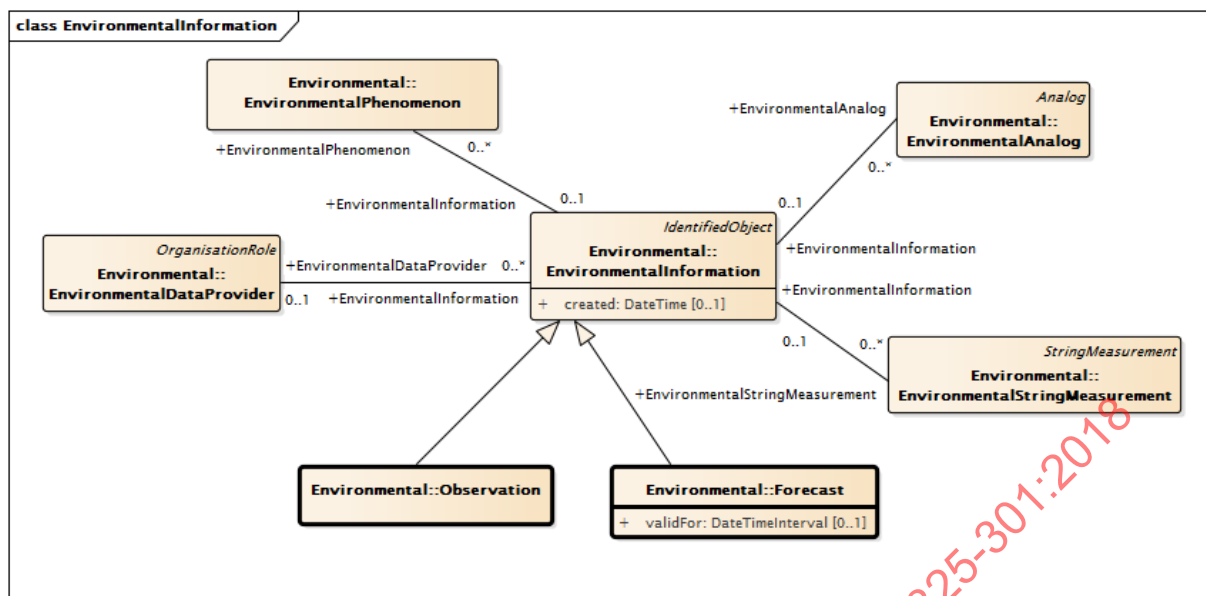


Figure 20 – Prévisions et observations

Le modèle de mesure pour les valeurs relatives à l'environnement est représenté dans la Figure 21. Les grandeurs analogiques associées aux prévisions et aux prévisions et aux observations sont réparties en sous-classes selon la région dans laquelle elles apparaissent (atmosphère, géosphère, hydrosphère ou espace) et un attribut type ('kind') permet la définition explicite de la grandeur mesurée (par exemple, la température atmosphérique, la température superficielle de l'eau, l'humidité ou l'éclairement énergétique). Les grandeurs analogiques s'appuient sur les définitions des calculs statistiques fournies par les classes ExtendedAnalog associées ('CalculationMethodHierarchy', 'CalculationMethodOrder', 'StatisticalCalculation', et 'PeriodicStatisticalCalculation'), qui prennent en charge la définition claire de la signification d'une grandeur analogique. Ceci permet, par exemple, de décrire une grandeur analogique comme une 'pointe horaire d'un échantillonnement de température de 5 min'. Les grandeurs environnementales analogiques utilisent la classe usuelle IEC 61970 'AnalogValue', tandis que les grandeurs environnementales de chaîne (utilisées pour exprimer des conditions météorologiques, comme 'brouillard dense') utilisent une spécialisation de la classe IEC 61970 'StringMeasurementValue'.

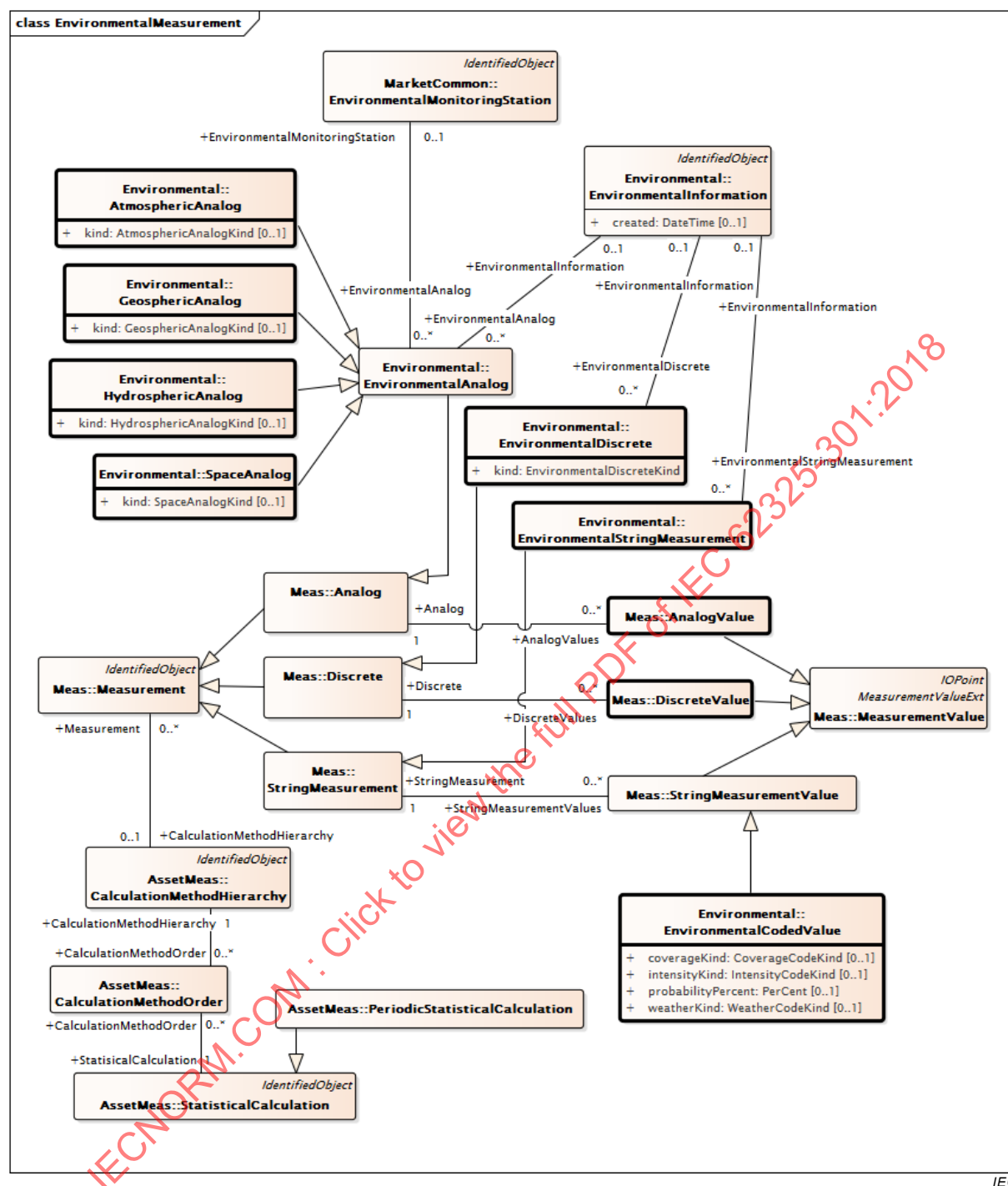
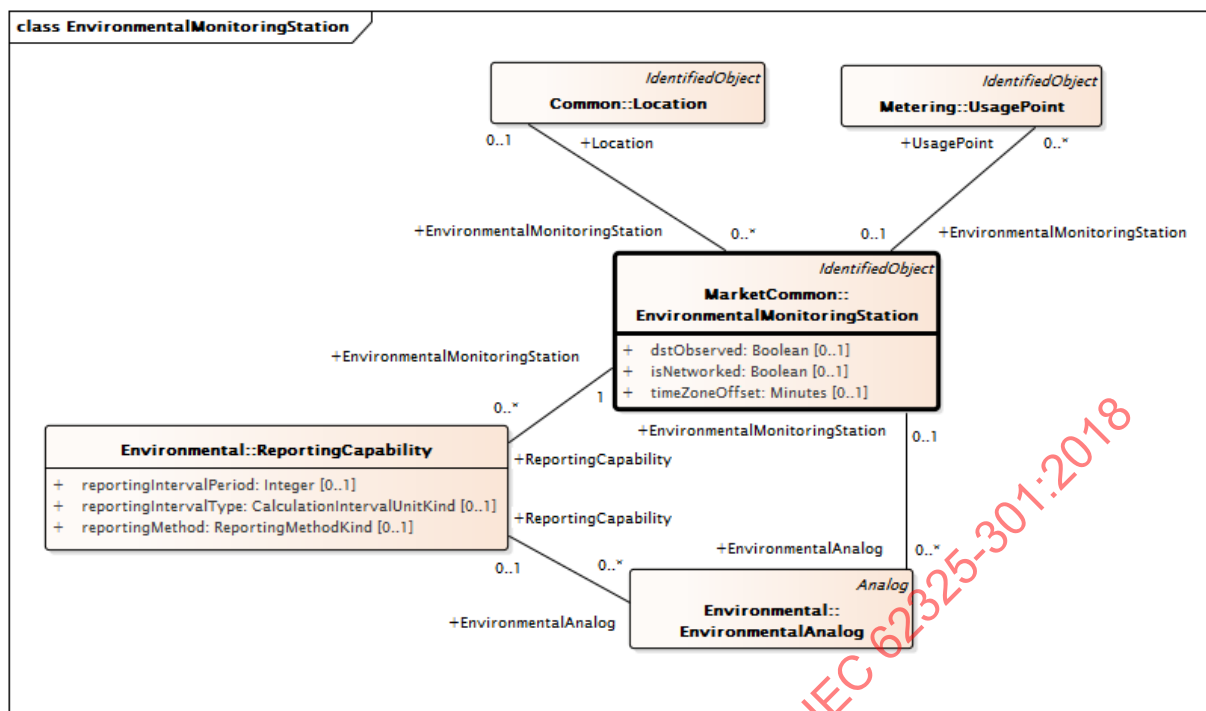


Figure 21 – Measurements environnementaux

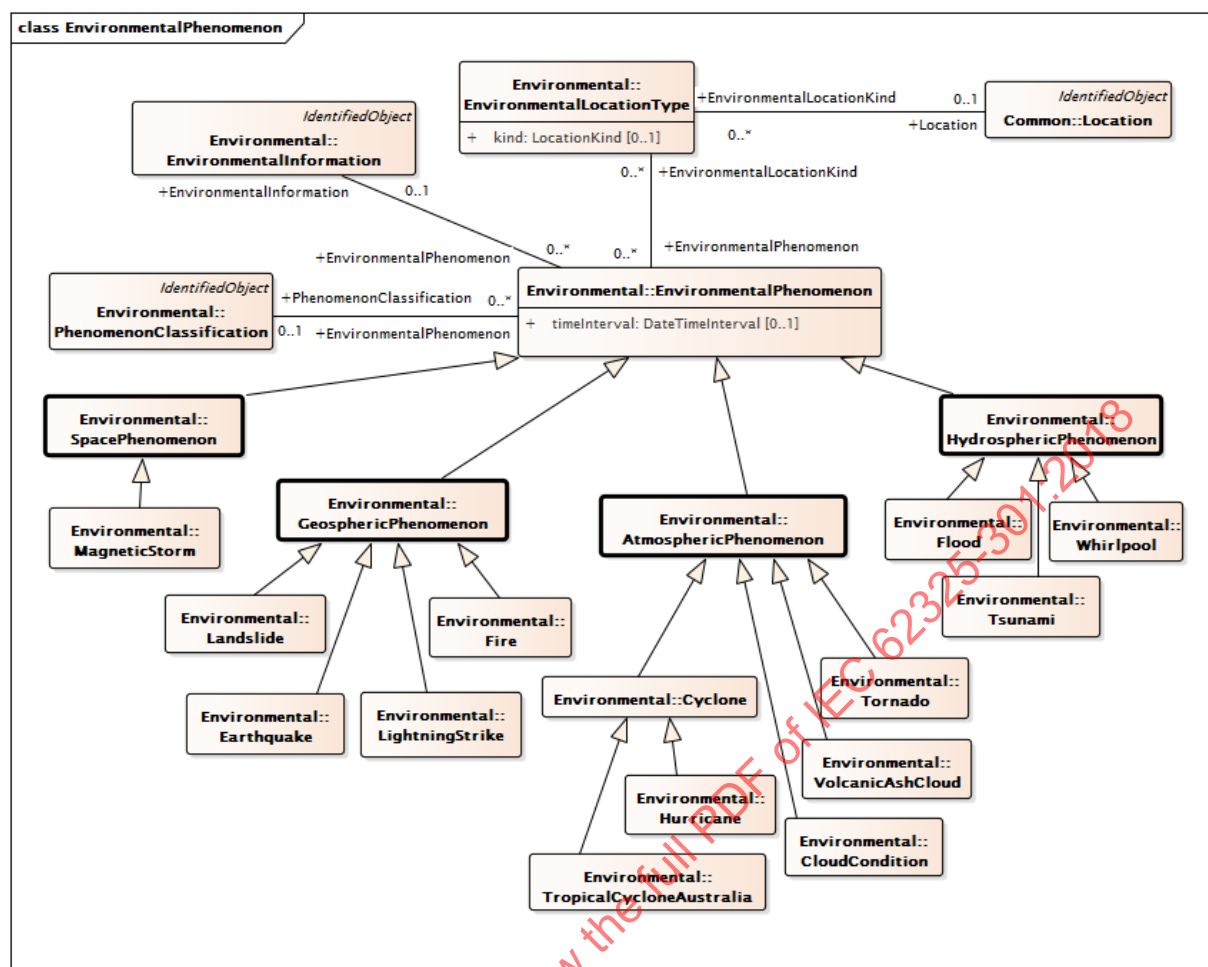
Les stations de surveillance environnementale, dont un modèle est représenté dans la Figure 22, peuvent fournir des valeurs analogiques correspondant aux observations. Les capacités de ces stations sont définies par la classe 'ReportingCapability'. Une association entre les classes 'EnvironmentalMonitoringStation' et 'UsagePoint' empêche l'éventualité qu'une station de surveillance puisse être associée à un compteur ou à un client.



IEC

Figure 22 – Station de surveillance environnementale

La Figure 23 donne une vue d'ensemble de la modélisation des phénomènes environnementaux. Les caractéristiques des phénomènes environnementaux (c'est-à-dire, les ouragans, les tornades, les feux de prairie, les inondations, les tempêtes dans le champ géomagnétique) à un moment donné sont décrites par la classe 'EnvironmentalPhenomenon' et ses enfants, qui sont sous-classés à l'aide des groupements régionaux utilisés pour les valeurs analogiques (atmosphère, géosphère, hydrosphère et espace). Les emplacements des phénomènes sont souvent décrits par un centre et un encombrement. Ils sont pris en charge par la classe 'EnvironmentalLocationKind'.



IEC

Figure 23 – Phénomène environnemental

Une définition supplémentaire de la sévérité des phénomènes peut être réalisée à l'aide de la classe 'PhenomenonClassification' et des classes associées, ce qui permet à une autorité responsable des données environnementales (par exemple, un service météorologique ou une entreprise d'électricité) de définir les niveaux seuils des valeurs de mesure associées aux conditions de classification du phénomène. Ces niveaux sont représentés dans la Figure 24.

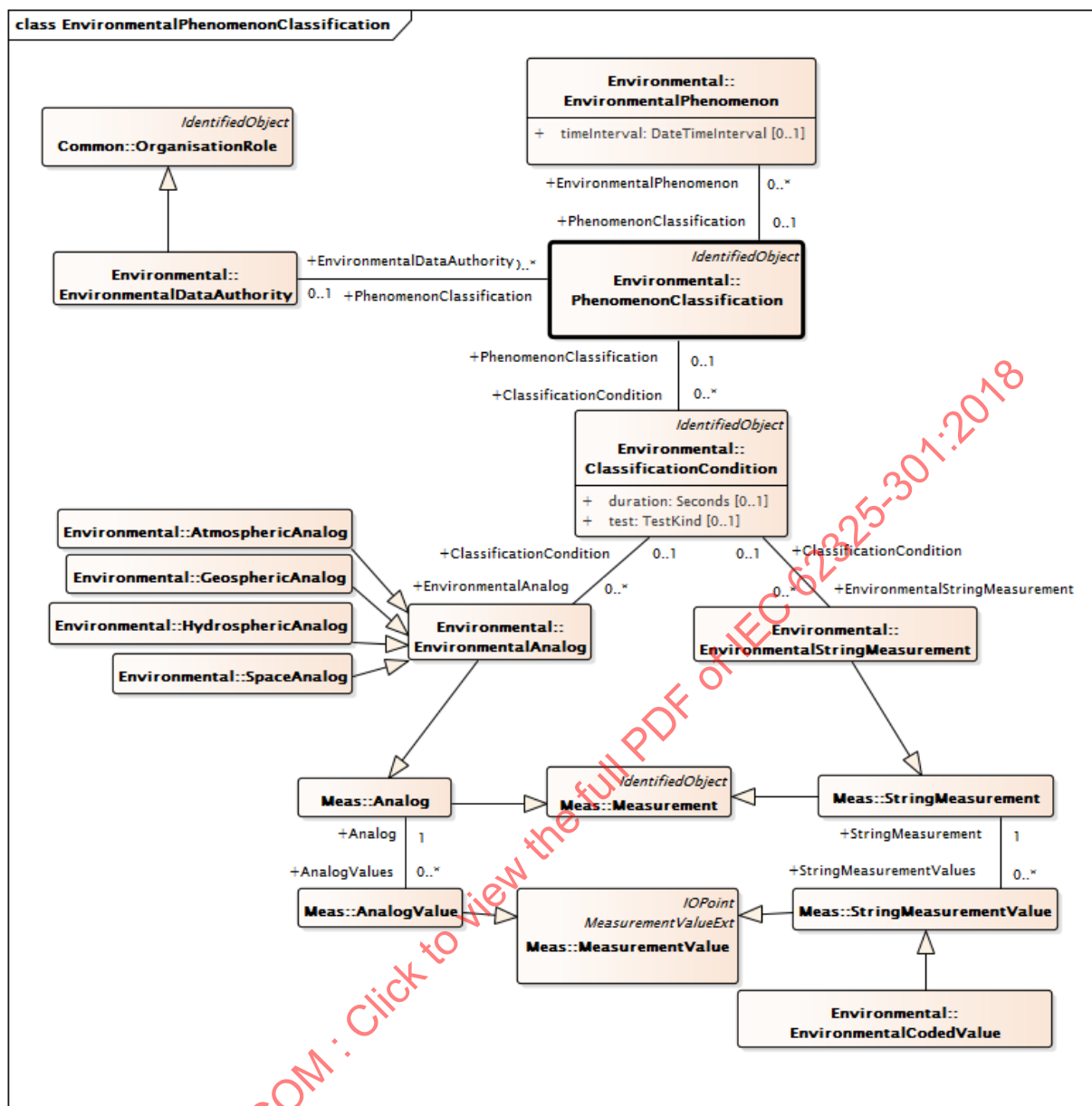
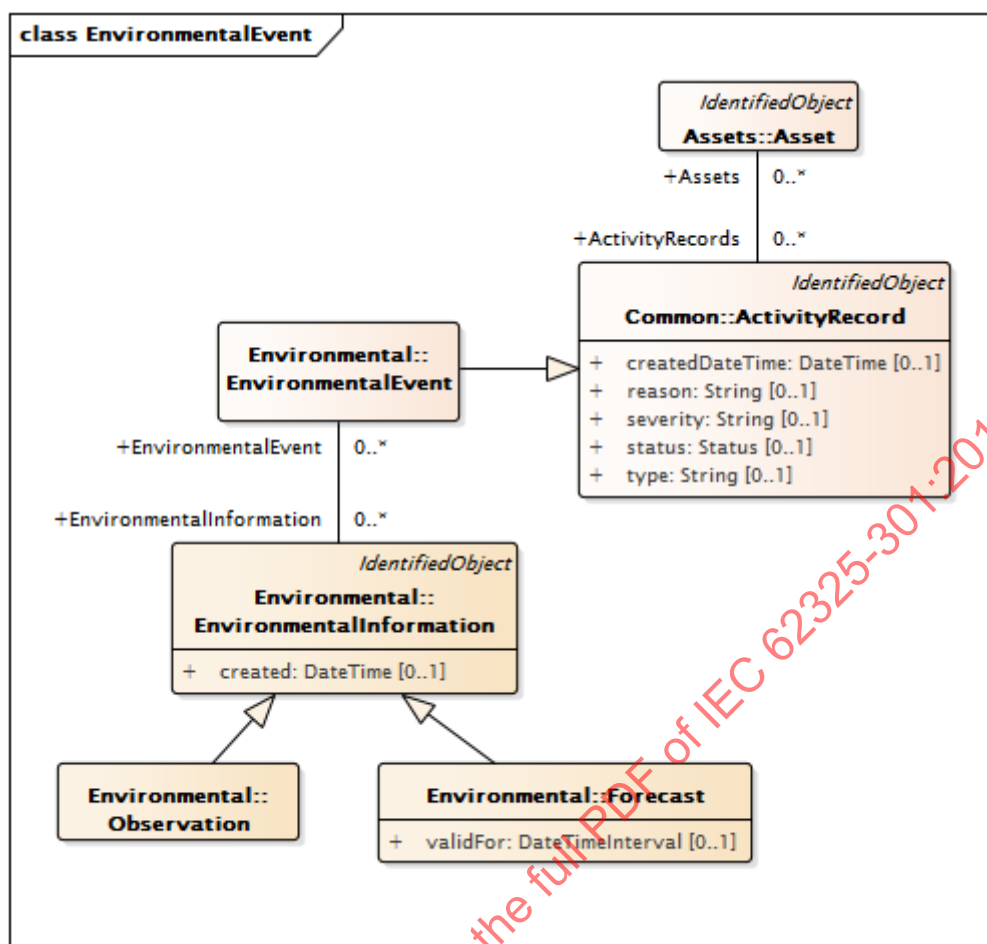


Figure 24 – Classification environnementale d'un phénomène

La Figure 25 représente la modélisation des événements environnementaux. Les principaux événements, comme l'ouragan Katrina ou le séisme de 2008 au Sichuan, sont représentés par la classe EnvironmentalEvent et peuvent être décrits dans le temps au moyen de diverses prévisions et/ou observations (instance de la classe enfant 'EnvironmentalInformation'), chacune des ces prévisions/observations étant liée à l'événement environnemental et chacune comprenant un ou plusieurs phénomènes 'snapshots' (instantanés) (instances de la classe enfant 'EnvironmentalPhenomenon').



IEC

Figure 25 – Événement environnemental

Les alertes environnementales sont représentées dans la Figure 26. Les alertes environnementales, telles que les veilles et les avertissements de tornade, sont décrites par la classe 'EnvironmentalAlert', qui prend en charge la définition du fournisseur d'alerte, de l'autorité compétente en matière d'alerte, et de l'emplacement de l'alerte. Les autorités compétentes en matière d'alerte (comme le service météorologique national des États-Unis – National Weather Service) mettent régulièrement à jour les types et les définitions des alertes qu'elles peuvent émettre. La classe 'AlertTypeList' permet de spécifier la version utilisée des définitions d'alerte. Certaines alertes s'appliquent à des emplacements primaires et secondaires. La classe 'EnvironmentalLocationKind' permet d'effectuer la distinction correspondante.

En plus de prendre en charge l'identification des principaux événements, appelés événements environnementaux (tels que les incendies ou les tsunamis), la classe 'EnvironmentalEvent' prend également en charge la définition des événements environnementaux locaux de moindre ampleur (tels que les inondations localisées) et leur permet d'être mis en relation avec les constituants du patrimoine.

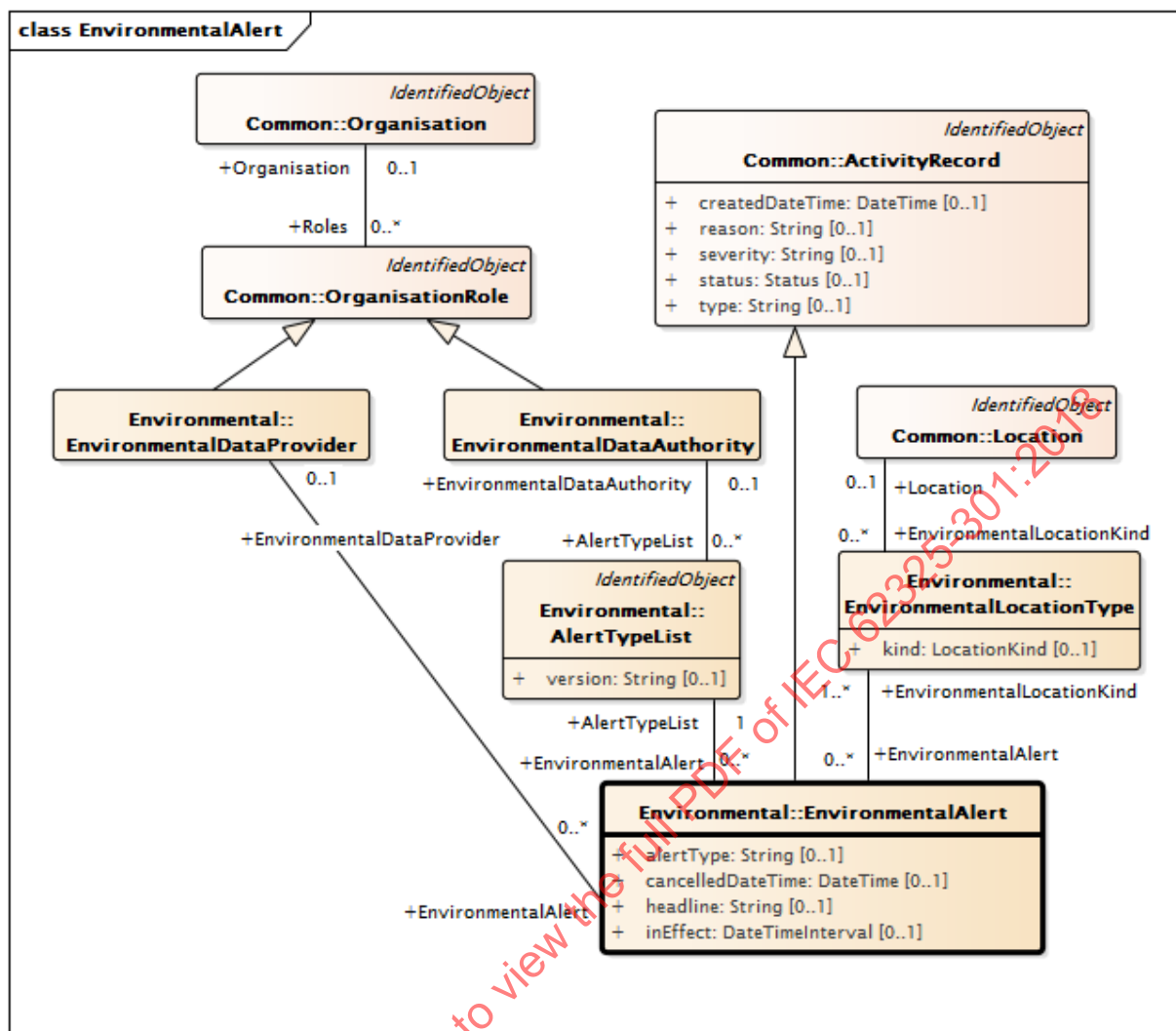


Figure 26 – Alerte environnementale

4.5 Lignes directrices relatives à la modélisation

4.5.1 Modélisation pour changements

L'IEC 62325-301 et l'IEC 61970-301, ainsi que l'IEC 61970-302 et l'IEC 61968-11, définissent le CIM.

4.5.2 Processus pour les amendements au CIM

Il peut être souhaitable d'amender le CIM pour réviser le modèle ou pour étendre le CIM afin de modéliser des éléments supplémentaires d'un système électrique. Le processus recommandé pour ces amendements est le suivant.

- Préparer un ou plusieurs cas d'utilisation (Use Case) décrivant les changements souhaités. Il convient que cela inclue les changements proposés aux diagrammes de classe concernés avec représentation des classes, attributs et associations nouveaux ou révisés.
- Le ou les cas d'utilisation sont ensuite examinés par le groupe de travail approprié, qui va décider s'il convient que les changements demandés soient traités en tant que révisions de la norme CIM en vigueur ou s'il convient qu'ils soient traités comme des amendements privés sans exiger de changement pour la norme.

- c) Les propositions d'amendements acceptées par le groupe de travail seront ajoutées à la liste des sujets majeurs et, le moment venu, une nouvelle version du modèle CIM sera préparée et une mise à jour de la spécification IEC du CIM appropriée sera faite.

4.5.3 Changements apportés au modèle UML du CIM

Du point de vue de la modélisation, lorsque le CIM est étendu, l'approche doit partir du modèle UML de CIM existant. Les extensions peuvent être ajoutées de plusieurs façons disponibles avec UML, mais dans tous les cas, la bonne approche doit examiner le modèle en vigueur et déterminer la meilleure extension à partir des diagrammes de classe existants. Les extensions peuvent prendre l'une des formes suivantes, de la plus simple à la plus complexe:

- ajouter des attributs supplémentaires à des classes préexistantes;
- ajouter des associations supplémentaires entre deux classes préexistantes;
- ajouter de nouvelles classes constituant des spécialisations de classes préexistantes;
- ajouter de nouvelles classes à l'aide d'associations avec des classes préexistantes.

L'objectif principal est de réutiliser au maximum le CIM. Du point de vue des paquetages, il convient que les extensions soient faites aux paquetages existants chaque fois que cela est possible. Si les extensions comprennent un nouveau domaine d'application, il convient d'envisager de créer un nouveau paquetage pour les additions, mais en créant toujours les associations nécessaires au paquetage préexistant, en gardant à l'esprit que, bien qu'un nouveau paquetage soit créé, le CIM continue d'être un seul modèle.

4.5.4 Changements apportés aux documents normatifs du CIM

D'un point de vue documentaire, lorsque le CIM est étendu, une décision doit être prise quant à la question de savoir si les changements constituent des mises à jour de documents normatifs sur le CIM ou si une nouvelle spécification partie 3xx est exigée.

4.5.5 Profils CIM

Il n'est pas nécessaire qu'une mise en œuvre du CIM implique la conformité de tous les classes, attributs et associations de la spécification CIM à la norme CIM. Des profils peuvent être définis pour spécifier les éléments devant être inclus (c'est-à-dire, les éléments obligatoires) pour une utilisation particulière du CIM, ainsi que ceux qui sont facultatifs. Le CIM pour les profils de marché est défini dans les Parties IEC 62325-35X et 45X de la série et doit respecter les règles de modélisation de l'IEC 62325-450.

Dans l'IEC 62325-450, la définition des profils CIM suit un cadre de modélisation en couches qui va du CIM jusqu'à la spécification des messages en fonction des concepts CIM, à travers la définition de plusieurs modèles contextuels régionaux et de leurs documents contextualisés ultérieurs pour l'échange d'informations.

Une analyse complète des règles associées aux profils de la série IEC 62325 est présentée dans l'IEC 62325-450. Se reporter à l'IEC 62325-450 pour obtenir une explication et une description complètes de ces règles.

4.6 Outils de modélisation

Le modèle UML du CIM complet existe sous la forme d'un fichier de projet Enterprise Architect. Il est possible de le visualiser avec l'outil Enterprise Architect, y compris les diagrammes de classe et les descriptions des classes, des attributs, des types et des relations. La visualisation du CIM de cette façon offre une interface de navigation graphique qui permet de visualiser toutes les données de spécification du CIM par simple pointer-cliquer sur le diagramme de classe dans chaque paquetage. Une visionneuse gratuite est disponible auprès de Sparx Systems.

Idéalement, le modèle d'information du CIM est indépendant de tout outil UML spécifique, bien que l'expérience ait montré que les échanges entre des outils différents sont souvent loin d'être parfaits. En attendant que l'interopérabilité des outils devienne réalité, les futurs changements apportés à la spécification du CIM, débouchant sur de nouvelles versions de la présente norme, seront incorporés en premier lieu dans la description du projet Enterprise Architect pour garantir une source unique pour les données de modèle CIM.

5 Modèle détaillé

5.1 Vue d'ensemble

Le modèle d'information commun (CIM) représente une vue logique complète des informations d'un système des opérations du marché. Cette définition inclut les classes et les attributs publics, ainsi que leurs relations. Le Paragraphe 5.2 décrit comment l'Article 6 est structuré. L'Article 6 est automatiquement généré à partir du modèle CIM.

5.2 Contexte

Le CIM est fractionné en sous-paquetages. Les classes au sein des paquetages sont énumérées alphabétiquement. Les attributs natifs d'une classe sont énumérés en premier, suivis des attributs hérités, dans l'ordre de profondeur d'héritage, puis du nom d'attribut. Les associations natives sont énumérées en premier pour chaque classe, suivies, dans l'ordre de profondeur d'héritage, des associations héritées, suivies, dans l'ordre alphabétique, du nom de classe, suivi, dans l'ordre alphabétique, du nom d'extrémité d'association. Les associations sont décrites selon le rôle de chaque classe participant à l'association. Les extrémités d'association sont répertoriées pour chaque classe à chaque extrémité d'une association.

Pour chaque paquetage, le modèle d'information de chaque classe est entièrement décrit dans des tableaux d'attributs et d'extrémités d'association. Les informations relatives aux attributs et extrémités d'association concernant les attributs natifs et hérités sont énumérées comme indiqué dans le Tableau 1 et le Tableau 2. Pour chaque attribut ou extrémité d'association hérités, la colonne "description" contiendra le texte indiquant que les attributs sont hérités d'une classe spécifique. La colonne "description" des attributs et extrémités d'association natifs contient la description réelle.

Tableau 1 – Documentation d'attribut

nom	type	description
native1	Float	Un attribut natif à virgule flottante de la classe est décrit ici.
native2	ActivePower	Documentation pour un autre attribut natif du type ActivePower.
Name	Float	Hérité de la classe IdentifiedObject

Comme indiqué dans le Tableau 1, dans un tableau attributs, un attribut est dans certains cas une constante; l'expression "(const)" est alors ajoutée dans la colonne "nom" du tableau d'attributs. Dans de tels cas, l'attribut a normalement une valeur initiale qui est précédée du signal "égal" et accolée au nom d'attribut.

Tableau 2 – Documentation des extrémités d'association

[mult à partir de]	[mult vers] nom	type	description
[0..*]	[0..1] PSRType	PSRType	PSRType (classification personnalisée) pour cette PowerSystemResource.
[0..1]	[0..*] Measurements	Measurement	Measurements inclus dans la hiérarchie de dénomination dans laquelle le PSR est l'élément conteneur.
[1..1]	[0..*] OperatingShare	OperatingShare	Lien à n'importe quel nombre d'objets de quote-part d'opérateur.
[0..*]	[0..*] PsrLists	PsrList	
[1..1]	[0..1] OutageSchedule	OutageSchedule	Une ressource de système électrique peut avoir un programme d'indisponibilité.
[0..*]	[0..*] ReportingGroup	ReportingGroup	Groupes de production de rapports auxquels appartient cette PSR.
[0..1]	[0..*] DiagramObjects	DiagramObject	Hérité de: IdentifiedObject
[1..1]	[0..*] Names	Name	Hérité de: IdentifiedObject

Comme indiqué dans le Tableau 2, dans un tableau d'extrémités d'association, la première colonne décrit la multiplicité à l'autre extrémité de l'association (c'est-à-dire, la multiplicité de la classe pour laquelle des extrémités d'association sont décrites). La multiplicité de l'extrémité d'association elle-même est incluse entre crochets. Le nom de l'extrémité d'association est répertorié en texte en clair. La classe à l'autre extrémité de l'association est énumérée dans la colonne "type". Une multiplicité zéro indique une association facultative. Une multiplicité "*" indique que n'importe quel nombre est admis. Par exemple, une multiplicité [1..*] indique qu'une plage allant de 1 à n'importe quel nombre supérieur est admise.

Lorsqu'une classe est une classe d'énumération, le tableau d'attributs est remplacé par le tableau d'enums comme indiqué dans le Tableau 3, car les libellés enumeration n'ont pas de type. Il n'existe pas de libellés d'énumération hérités pour une classe d'énumération.

Tableau 3 – Documentation des Enums

libellé	description
native1	Il s'agit de la première valeur enumeration native.
native2	Il s'agit de la deuxième valeur enumeration native.
native3	Il n'y a typiquement pas d'attributs hérités pour les énumérations.

6 Paquetage supérieur IEC62325

6.1 Généralités

Les sous-paquetages IEC 62325 du CIM sont développés, normalisés et maintenus par l'IEC.

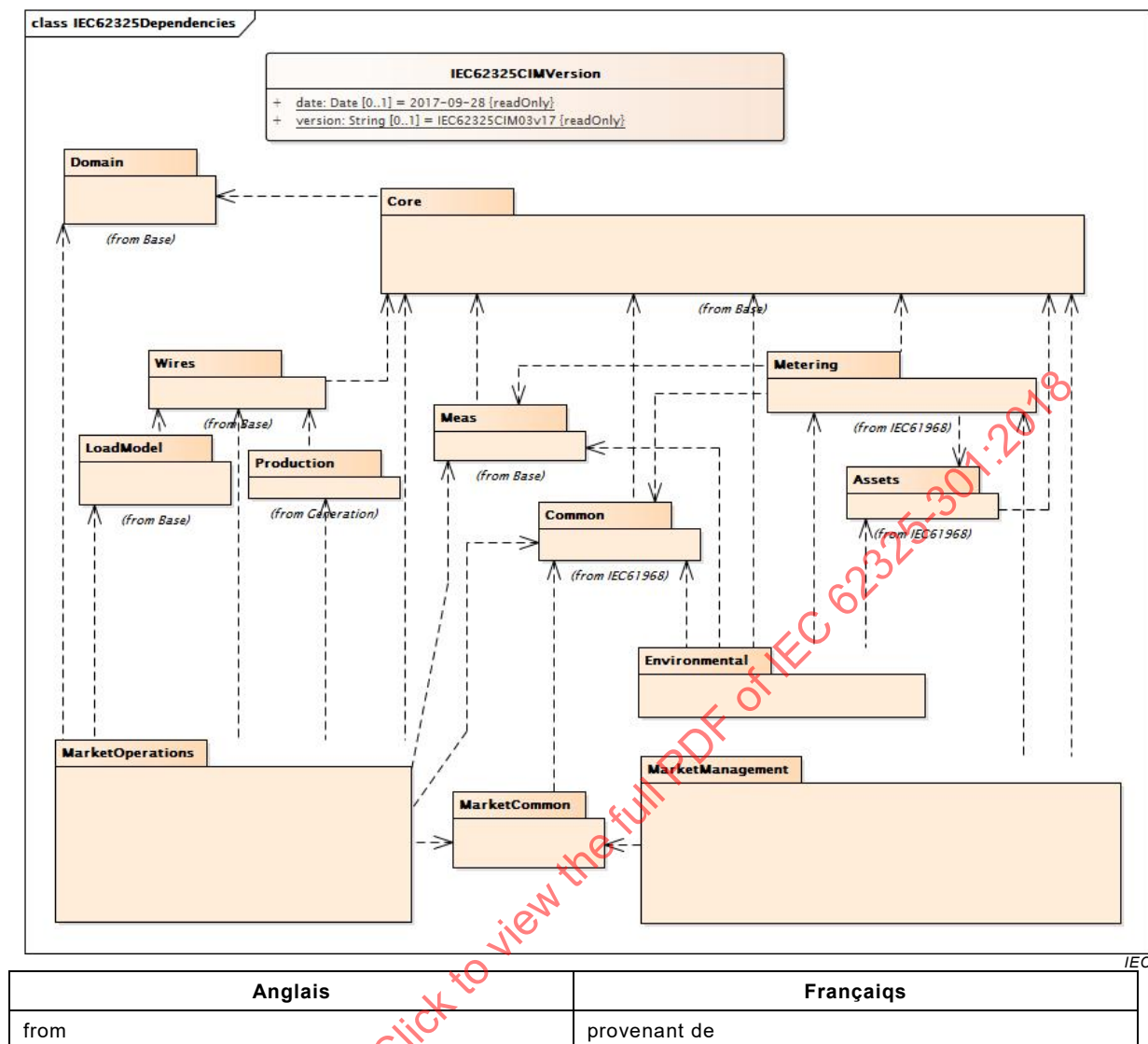


Figure 27 – Diagramme de classe IEC62325::IEC62325Dependencies

Figure 27: Représente les paquets IEC 62325 du niveau de version et de niveau supérieur ainsi que leurs dépendances logiques avec les autres paquets par héritage uniquement. Les paquets qui font référence à une norme IEC sont documentés dans les autres spécifications de normes IEC. Les paquets sans références sont documentés dans l'Article 6.

6.2 Classe racine IEC62325CIMVersion

Numéro de version de l'IEC 62325 attribué à ce modèle UML.

Le Tableau 4 présente tous les attributs de IEC62325CIMVersion.

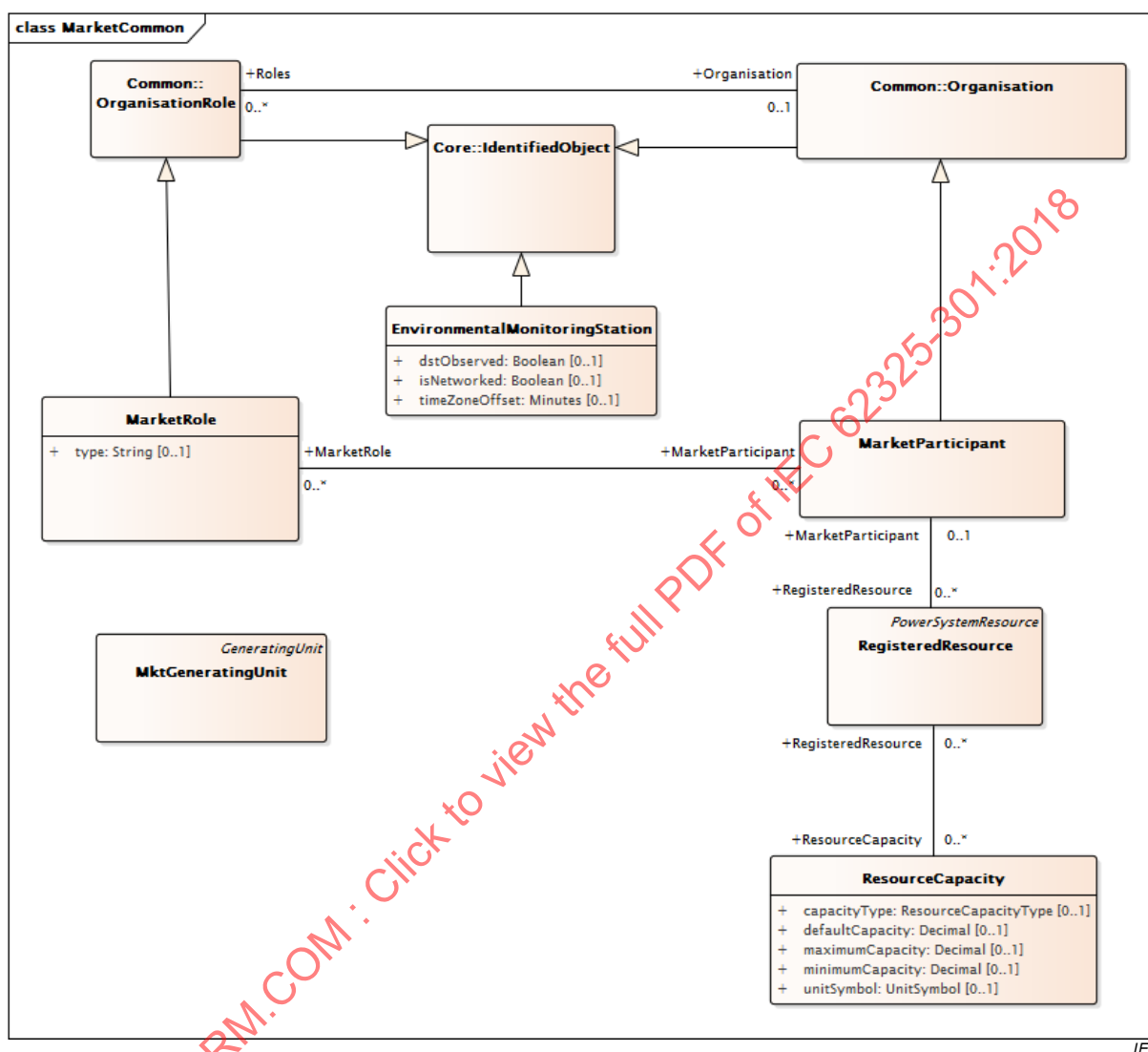
Tableau 4 – Attributs de IEC62325::IEC62325CIMVersion

nom	mult	type	description
date	0..1	Date	(const=2017-09-28) La forme est AAAA-MM-JJ; par exemple, le 5 janvier 2009 est 2009-01-05.
version	0..1	String	(const=IEC62325CIM03v17) La forme est IEC62325CIMXXvYY où XX est la version principale du paquetage du CIM et YY la version secondaire. Par exemple, IEC62325CIM10v03.

6.3 Paquetage MarketCommon

6.3.1 Généralités

Ce paquetage contient les objets communs partagés par les paquetages MarketManagement, MarketOperations et Environmental.



IEC

Figure 28 – Diagramme de classe MarketCommon::MarketCommon

Figure 28: représente les classes communes utilisées par les paquetages MarketManagement, MarketOperations et Environmental.

6.3.2 MarketParticipant

Identification d'une partie agissant dans un processus métier du marché de l'électricité. Cette classe est utilisée pour identifier les organisations qui peuvent participer à la gestion et/ou aux opérations du marché.

Le Tableau 5 présente tous les attributs de MarketParticipant.

Tableau 5 – Attributs de MarketCommon::MarketParticipant

nom	mult	type	description
streetAddress	0..1	StreetAddress	Hérité de: Organisation
postalAddress	0..1	StreetAddress	Hérité de: Organisation
phone1	0..1	TelephoneNumber	Hérité de: Organisation
phone2	0..1	TelephoneNumber	Hérité de: Organisation
electronicAddress	0..1	ElectronicAddress	Hérité de: Organisation
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 6 présente toutes les extrémités d'association de MarketParticipant avec d'autres classes.

Tableau 6 – Extrémités d'association de MarketCommon::MarketParticipant avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MarketPerson	0..*	MarketPerson	
0..*	MarketDocument	0..*	MarketDocument	
0..1	SchedulingCoordinator	0..*	SchedulingCoordinator	
0..1	RegisteredResource	0..*	RegisteredResource	
0..1	Bid	0..*	Bid	
0..*	TimeSeries	0..*	TimeSeries	
0..*	MarketRole	0..*	MarketRole	
0..*	ParentOrganisation	0..1	ParentOrganization	Hérité de: Organisation
0..1	Roles	0..*	OrganisationRole	Hérité de: Organisation
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.3.3 MarketRole

Comportement externe joué par une partie du marché de l'électricité.

Le Tableau 7 présente tous les attributs de MarketRole.

Tableau 7 – Attributs de MarketCommon::MarketRole

nom	mult	type	description
type	0..1	String	Type de rôle du marché que les parties peuvent jouer dans certains domaines du marché de l'électricité. Les types sont souples; ils utilisent le type de données String pour la libre entrée des types de rôles.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 8 présente toutes les extrémités d'association de MarketRole avec d'autres classes.

Tableau 8 – Extrémités d'association de MarketCommon::MarketRole avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MarketParticipant	0..*	MarketParticipant	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: OrganisationRole
0..*	Organisation	0..1	Organisation	Hérité de: OrganisationRole
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.3.4 RegisteredResource

Ressource enregistrée via le système d'enregistrement des participants du marché. Par exemple: unité de production, charge, générateur ou charge non physique.

Le Tableau 9 présente tous les attributs de RegisteredResource.

Tableau 9 – Attributs de MarketCommon::RegisteredResource

nom	mult	type	description
ACAFlag	0..1	YesNo	Indique que cette ressource est associée à une zone de réglage adjacente.
ASSPOptimizationFlag	0..1	YesNo	Indique que cette ressource participe au processus d'optimisation par défaut.
commercialOpDate	0..1	DateTime	Date d'exploitation commerciale de la ressource.
contingencyAvailFlag	0..1	YesNo	Disponibilité de la réserve d'exploitation contingente (Yes/No). La ressource est disponible pour participer avec la capacité dans la répartition de la contingence.
dispatchable	0..1	Boolean	Répartissable: indique si la ressource est répartissable. Ceci implique que la ressource est destinée à soumettre des offres d'achat/de vente d'énergie ou de services auxiliaires, ou des programmes autonomes.

nom	mult	type	description
ECAFlag	0..1	YesNo	Indique que cette ressource est associée à une zone de contrôle embarqué.
flexibleOfferFlag	0..1	YesNo	Indicateur d'offre flexible (Y/N).
hourlyPredispatch	0..1	YesNo	Indique une répartition nécessaire avant le début de l'heure d'exploitation. Uniquement pertinent sur le marché en temps réel. S'applique aux ressources de production, d'interconnexion et de charge participante. Valeur (Y/N).
isAggregatedRes	0..1	YesNo	Indicateur spécifiant si une ressource est une ressource agrégée.
lastModified	0..1	DateTime	Indique la date et l'heure à laquelle cet élément a été modifié/versionné pour la dernière fois.
LMPMFlag	0..1	YesNo	Indicateur LMPM: indique si la ressource est soumise à l'essai LMPM (Yes/No).
marketParticipationFlag	0..1	YesNo	Indicateur de participation au marché: indique si la ressource participe au marché.
maxBaseSelfSchedQty	0..1	Float	Quantité de base maximale à programmation automatique.
maxOnTime	0..1	Float	Temps d'exploitation maximal après démarrage.
minDispatchTime	0..1	Hours	Nombre minimal d'heures consécutives pendant lesquelles une ressource doit être répartie en cas d'acceptation de l'offre.
minOffTime	0..1	Float	Temps d'extinction minimal après arrêt.
minOnTime	0..1	Float	Temps d'exploitation minimal après démarrage.
mustOfferFlag	0..1	YesNo	Indicateur d'offre obligatoire: indique si l'unité est soumise aux dispositions d'offre obligatoire (Y/N).
nonMarket	0..1	YesNo	Indicateur spécifiant que la ressource ne participe pas aux opérations du marché.
pointOfDeliveryFlag	0..1	YesNo	Indique que la ressource enregistrée est une ressource Point de livraison (YES), ce qui implique qu'il existe un facteur de perte POD.
priceSetFlagDA	0..1	YesNo	Indicateur de définition du prix: indique si une ressource est capable de définir le prix d'équilibre sur le marché (Y) pour le marché DA et, si ce n'est pas le cas, indique si la ressource doit soumettre des offres pour l'énergie à 0 \$ (S) ou non (N). À l'origine, il était dans la classe RegisteredGenerator mais a été déplacé dans la classe RegisteredResource pour la répartition de la charge participante.
priceSetFlagRT	0..1	YesNo	Indicateur de définition du prix: indique si une ressource est capable de définir le prix d'équilibre sur le marché (Y) pour le marché RT et, si ce n'est pas le cas, indique si la ressource doit soumettre des offres pour l'énergie à 0 \$ (S) ou non (N). À l'origine, il était dans la classe RegisteredGenerator mais a été déplacé dans la classe RegisteredResource pour la répartition de la charge participante.

nom	mult	type	description
registrationStatus	0..1	ResourceRegistrationStatus	Statut d'enregistrement de la ressource: actif, suspendu, planifié ou hors service.
resourceAdequacyFlag	0..1	YesNo	Indique que cette ressource participe à la fonction d'adéquation de ressource.
SMPMFlag	0..1	YesNo	Indicateur SMPM: indique si la ressource est soumise à l'essai SMPM (Yes/No).
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
nom	0..1	String	Hérité de: IdentifiedObject

Le Tableau 10 présente toutes les extrémités d'association de RegisteredResource avec d'autres classes.

Tableau 10 – Extrémités d'association de MarketCommon::RegisteredResource avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MarketParticipant	0..1	MarketParticipant	
0..*	ForbiddenRegion	0..*	ForbiddenRegion	
0..*	AggregateNode	0..1	AggregateNode	Un AggregateNode peut être associé à plusieurs RegisteredResources.
1..1	DispatchInstReply	0..*	DispatchInstReply	
0..*	TimeSeries	0..*	TimeSeries	
0..*	RampRateCurve	0..*	RampRateCurve	
0..1	ContractDistributionFactor	0..*	ContractDistributionFactor	
1..1	OrgResOwnership	0..*	OrgResOwnership	
0..1	RMROperatorInput	0..*	RMROperatorInput	
0..1	ResourceDispatchResults	0..*	ResourceDispatchResults	
0..1	SubstitutionResourceList	0..*	SubstitutionResourceList	
0..*	AdjacentCaset	0..1	AdjacentCaset	
0..*	SubControlArea	0..*	SubControlArea	
1..1	IntermittentResourceEligibility	0..*	IntermittentResourceEligibility	
1..1	FormerReference	0..*	FormerReference	
1..1	Commitments	0..*	Commitments	
0..1	MPMResourceStatus	0..*	MPMResourceStatus	
0..1	RUCAwardInstruction	0..*	RUCAwardInstruction	
0..1	AllocationResultValues	0..*	AllocationResultValues	
1..1	LoadFollowingInst	0..*	LoadFollowingInst	
0..1	ResourceLoadFollowingInst	0..*	ResourceLoadFollowingInst	

mult à partir de	nom	mult vers	type	description
1..1	ResourceAncillaryServiceQualification	0..*	ResourceCertification	Les RegisteredResources sont qualifiées pour les types de services auxiliaires de ressource (qui incluent les types de produits du marché ainsi que d'autres types, tels que BlackStart) en étant associées à la classe ResourceAncillaryServiceQualification.
0..1	ExpectedEnergyValues	0..*	ExpectedEnergyValues	
0..*	Reason	0..*	Reason	
0..*	InterTie	0..*	SchedulingPoint	
0..*	MktConnectivityNode	0..1	MktConnectivityNode	
0..1	DopInstruction	0..*	DopInstruction	
0..*	ResourceCapacity	0..*	ResourceCapacity	
1..1	ResourceVerifiableCosts	0..1	ResourceVerifiableCosts	
1..1	DefaultBid	0..1	DefaultBid	
0..*	MarketObjectStatus	0..*	MarketObjectStatus	
0..*	ControlAreaDesignation	0..*	ControlAreaDesignation	
0..1	LoadFollowingOperatorInput	0..*	LoadFollowingOperatorInput	
0..*	MPMTestThreshold	0..*	MPMTestThreshold	
0..1	ResourceAwardInstruction	0..*	ResourceAwardInstruction	
0..1	ExPostResourceResults	0..*	ExPostResourceResults	
1..1	Instructions	0..*	Instructions	
0..*	Pnode	0..1	Pnode	Une ressource enregistrée injecte de la puissance au niveau d'un ou de plusieurs nœuds de connectivité lié à un pnode.
0..*	HostControlArea	0..1	HostControlArea	
0..*	Domain	0..*	Domain	
0..*	EnergyMarkets	0..*	EnergyMarket	
0..1	DotInstruction	0..*	DotInstruction	
0..*	PSRType	0..1	PSRType	Hérité de: PowerSystemResource
0..1	Controls	0..*	Control	Hérité de: PowerSystemResource
0..1	Measurements	0..*	Measurement	Hérité de: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	Hérité de: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	Hérité de: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.3.5 MktGeneratingUnit

Sous-classe de IEC61970:Production:GeneratingUnit

Le Tableau 11 présente tous les attributs de MktGeneratingUnit.

Tableau 11 – Attributs de MarketCommon::MktGeneratingUnit

nom	mult	type	description
allocSpinResP	0..1	ActivePower	Hérité de: GeneratingUnit
autoCtrlMarginP	0..1	ActivePower	Hérité de: GeneratingUnit
baseP	0..1	ActivePower	Hérité de: GeneratingUnit
controlDeadband	0..1	ActivePower	Hérité de: GeneratingUnit
controlPulseHigh	0..1	Seconds	Hérité de: GeneratingUnit
controlPulseLow	0..1	Seconds	Hérité de: GeneratingUnit
controlResponseRate	0..1	ActivePowerChangeRate	Hérité de: GeneratingUnit
efficiency	0..1	PerCent	Hérité de: GeneratingUnit
genControlMode	0..1	GeneratorControlMode	Hérité de: GeneratingUnit
genControlSource	0..1	GeneratorControlSource	Hérité de: GeneratingUnit
governorMPL	0..1	PU	Hérité de: GeneratingUnit
governorSCD	0..1	PerCent	Hérité de: GeneratingUnit
highControlLimit	0..1	ActivePower	Hérité de: GeneratingUnit
initialP	0..1	ActivePower	Hérité de: GeneratingUnit
longPF	0..1	Float	Hérité de: GeneratingUnit
lowControlLimit	0..1	ActivePower	Hérité de: GeneratingUnit
lowerRampRate	0..1	ActivePowerChangeRate	Hérité de: GeneratingUnit
maxEconomicP	0..1	ActivePower	Hérité de: GeneratingUnit
maximumAllowableSpinningReserve	0..1	ActivePower	Hérité de: GeneratingUnit
maxOperatingP	0..1	ActivePower	Hérité de: GeneratingUnit
minEconomicP	0..1	ActivePower	Hérité de: GeneratingUnit
minimumOffTime	0..1	Seconds	Hérité de: GeneratingUnit
minOperatingP	0..1	ActivePower	Hérité de: GeneratingUnit
modelDetail	0..1	Classification	Hérité de: GeneratingUnit
nominalP	0..1	ActivePower	Hérité de: GeneratingUnit
normalPF	0..1	Float	Hérité de: GeneratingUnit
penaltyFactor	0..1	Float	Hérité de: GeneratingUnit
raiseRampRate	0..1	ActivePowerChangeRate	Hérité de: GeneratingUnit
ratedGrossMaxP	0..1	ActivePower	Hérité de: GeneratingUnit
ratedGrossMinP	0..1	ActivePower	Hérité de: GeneratingUnit
ratedNetMaxP	0..1	ActivePower	Hérité de: GeneratingUnit
shortPF	0..1	Float	Hérité de: GeneratingUnit
startupCost	0..1	Money	Hérité de: GeneratingUnit
startupTime	0..1	Seconds	Hérité de: GeneratingUnit
tieLinePF	0..1	Float	Hérité de: GeneratingUnit
totalEfficiency	0..1	PerCent	Hérité de: GeneratingUnit
variableCost	0..1	Money	Hérité de: GeneratingUnit

nom	mult	type	description
aggregate	0..1	Boolean	Hérité de: Equipment
inService	0..1	Boolean	Hérité de: Equipment
networkAnalysisEnabled	0..1	Boolean	Hérité de: Equipment
normallyInService	0..1	Boolean	Hérité de: Equipment
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 12 présente toutes les extrémités d'association de MktGeneratingUnit avec d'autres classes.

**Tableau 12 – Extrémités d'association de MarketCommon::
MktGeneratingUnit avec d'autres classes**

mult à partir de	nom	mult vers	type	description
1..1	GeneratingUnitDynamicValues	0..*	GeneratingUnitDynamicValues	
0..1	RotatingMachine	0..*	RotatingMachine	Hérité de: GeneratingUnit
1..1	GenUnitOpCostCurves	0..*	GenUnitOpCostCurve	Hérité de: GeneratingUnit
1..1	GenUnitOpSchedule	0..1	GenUnitOpSchedule	Hérité de: GeneratingUnit
1..1	ControlAreaGeneratingUnit	0..*	ControlAreaGeneratingUnit	Hérité de: GeneratingUnit
1..1	GrossToNetActivePowerCurves	0..*	GrossToNetActivePowerCurve	Hérité de: GeneratingUnit
0..1	OperationalLimitSet	0..*	OperationalLimitSet	Hérité de: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	Hérité de: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	Hérité de: Equipment
0..1	Faults	0..*	Fault	Hérité de: Equipment
0..*	AdditionalEquipmentContainer	0..1	EquipmentContainer	Hérité de: Equipment
0..*	PSRType	0..1	PSRType	Hérité de: PowerSystemResource
0..1	Controls	0..*	Control	Hérité de: PowerSystemResource
0..1	Measurements	0..*	Measurement	Hérité de: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	Hérité de: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	Hérité de: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.3.6 EnvironmentalMonitoringStation

Station de surveillance environnementale; par exemple, une station météorologique ou une station de surveillance sismique.

Le Tableau 13 présente tous les attributs de EnvironmentalMonitoringStation.

Tableau 13 – Attributs de MarketCommon::EnvironmentalMonitoringStation

nom	mult	type	description
dstObserved	0..1	Boolean	Indique si cette station produit actuellement un rapport en utilisant l'heure d'été. Destiné à venir en aide à un service météorologique d'une entreprise d'électricité lors de l'interprétation des informations provenant d'une station. N'a aucune relation directe avec la manière dont le temps est exprimé dans EnvironmentalValueSet.
isNetworked	0..1	Boolean	Indique que cette station fait partie d'un réseau de stations utilisé pour surveiller un phénomène météorologique couvrant une zone géographique importante.
timeZoneOffset	0..1	Minutes	Décalage temporel par rapport à UTC (aussi appelé GMT) configuré dans la station "clock", pas (nécessairement) la zone temporelle dans laquelle la station est physiquement située. Cet attribut existe afin de prendre en charge la gestion des stations de surveillance d'une entreprise d'électricité et n'a aucune relation directe avec la manière dont le temps est exprimé dans EnvironmentalValueSet.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 14 présente toutes les extrémités d'association de EnvironmentalMonitoringStation avec d'autres classes.

Tableau 14 – Extrémités d'association de MarketCommon::EnvironmentalMonitoringStation avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Location	0..1	Location	Emplacement de cette station de surveillance.
0..1	UsagePoint	0..*	UsagePoint	
0..1	EnvironmentalAnalog	0..*	EnvironmentalAnalog	Mesure environnementale analogique fournie par cette station de surveillance.
0..*	TimeSeries	0..*	TimeSeries	
1..1	ReportingCapability	0..*	ReportingCapability	L'une des capacités de production de rapports de cette station de surveillance.
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.3.7 Classe racine ResourceCapacity

Cette classe modélise les différentes capacités d'une ressource. Une ressource peut avoir un certain nombre de capacités liées à l'exploitation, aux services auxiliaires, au commerce d'énergie, etc. Les capacités peuvent être définies pour la puissance active ou la puissance réactive.

Le Tableau 15 présente tous les attributs de ResourceCapacity.

Tableau 15 – Attributs de MarketCommon::ResourceCapacity

nom	mult	type	description
capacityType	0..1	ResourceCapacityType	Type de capacité Exemples de types: Régulation à la hausse Régulation à la baisse Réserve tournante Réserve non tournante Capacité FOO Capacité MOO
defaultCapacity	0..1	Decimal	Capacité par défaut
maximumCapacity	0..1	Decimal	Capacité maximale
minimumCapacity	0..1	Decimal	Capacité minimale
unitSymbol	0..1	UnitSymbol	Sélection d'unité pour les valeurs de capacité.

Le Tableau 16 présente toutes les extrémités d'association de ResourceCapacity avec d'autres classes.

Tableau 16 – Extrémités d'association de MarketCommon::ResourceCapacity avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..*	RegisteredResource	

6.4 Paquetage MarketManagement

6.4.1 Généralités

Ce paquetage contient toutes les principales extensions de marché du CIM exigées pour les systèmes de gestion de marché.

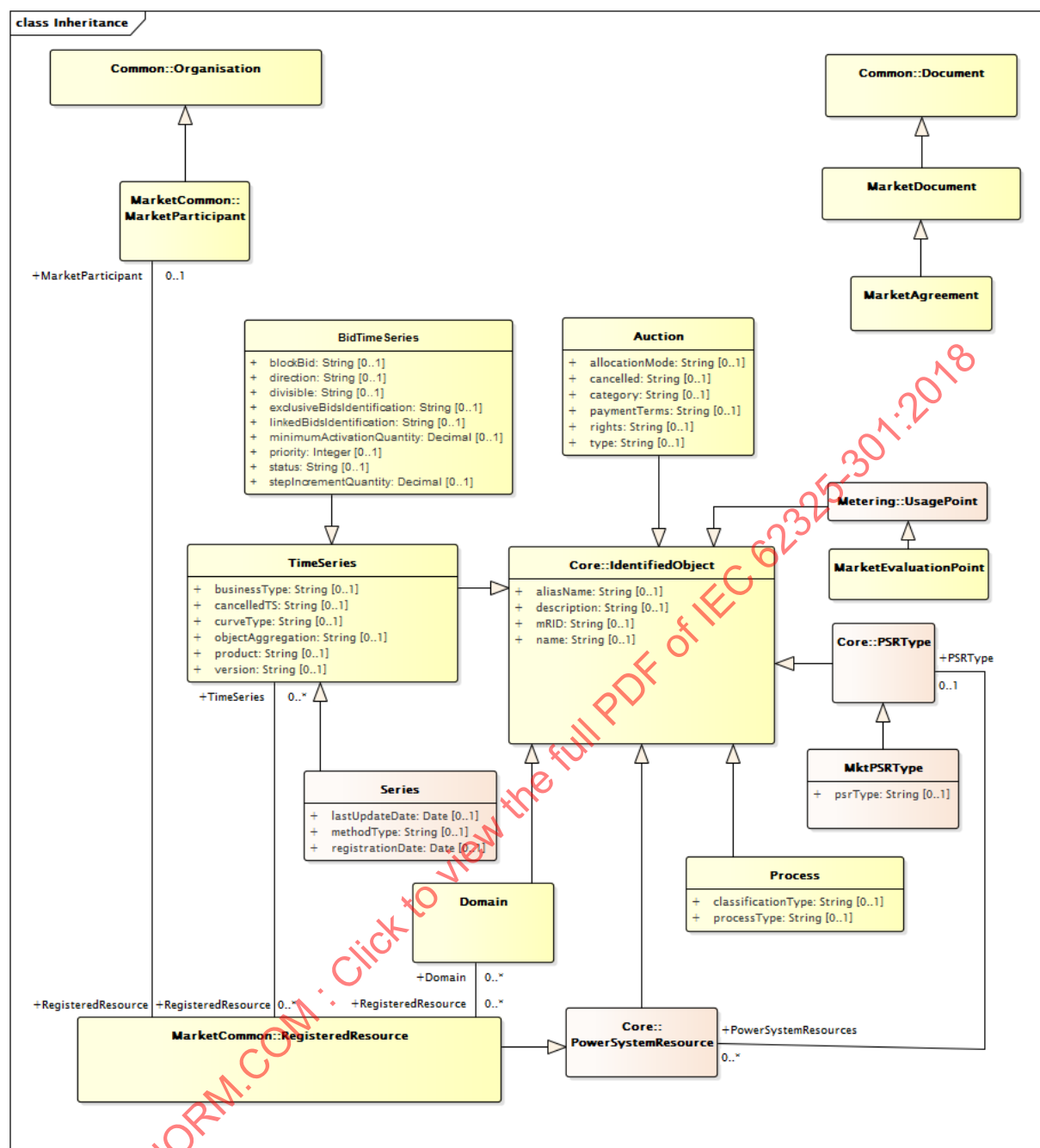
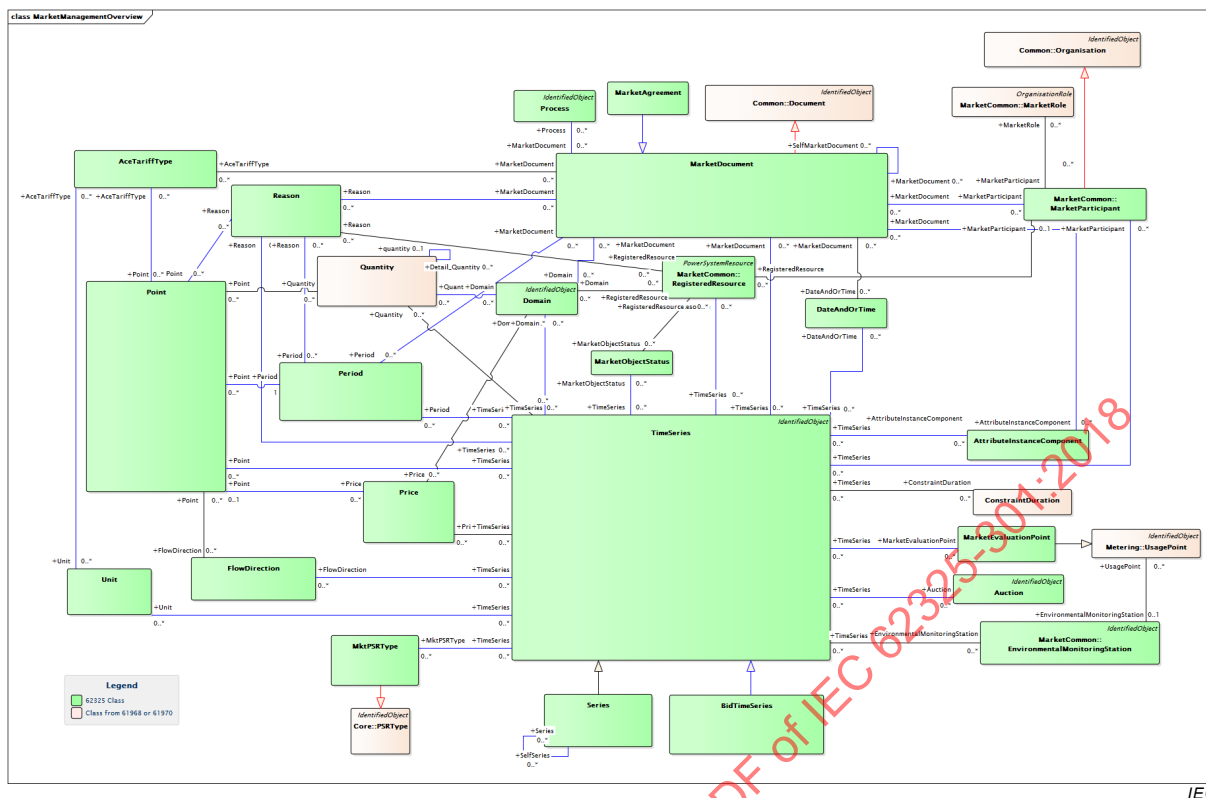


Figure 29 – Diagramme de classe MarketManagement::Inheritance

Figure 29: Fournit la structure des héritages de la gestion de marché.

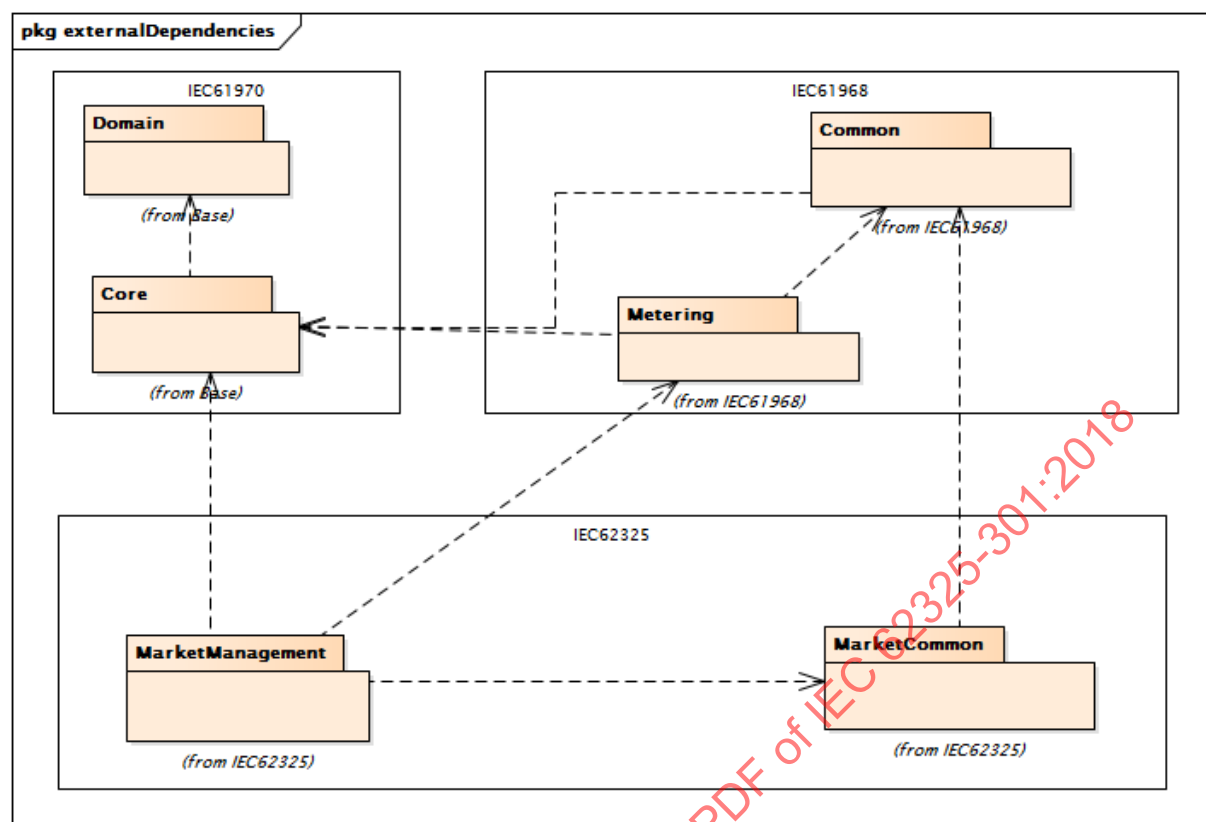


Anglais	Français
Legend	Légende
62325 class	Classe 62325
Class from 61968 or 61970	Classe issue de 61968 ou 61970

Figure 30 – Diagramme de classe MarketManagement::MarketManagementOverview

Figure 30: Décrit toutes les classes utilisées pour la définition des profils de gestion de marché.

Il est possible de voir toutes les dépendances avec d'autres concepts communs du CIM dans les systèmes de gestion d'énergie et les systèmes de gestion de la distribution.



Anglais	Français
from Base	provenant de Base
from IEC61968	issu de IEC61968
from IEC62325	issu de IEC62325

Figure 31 – Diagramme de paquetages MarketManagement::externalDependencies

Figure 31: Fournit les dépendances externes de la gestion du marché.

6.4.2 Classe racine AceTariffType

Type de tarif des erreurs de Zone de réglage (ACE – Area Control Error) qui est appliqué ou utilisé.

Le Tableau 17 présente tous les attributs de AceTariffType.

Tableau 17 – Attributs de MarketManagement::AceTariffType

nom	mult	type	description
type	0..1	String	Type codé d'un tarif ACE.

Le Tableau 18 présente toutes les extrémités d'association de AceTariffType avec d'autres classes.

Tableau 18 – Extrémités d'association de MarketManagement::AceTariffType avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Unit	0..*	Unit	
0..*	MarketDocument	0..*	MarketDocument	
0..*	Point	0..*	Point	

6.4.3 Classe racine AttributeInstanceComponent

Classe utilisée pour fournir des informations sur un attribut.

Le Tableau 19 présente tous les attributs de AttributeInstanceComponent.

Tableau 19 – Attributs de MarketManagement::AttributeInstanceComponent

nom	mult	type	description
attribute	0..1	String	Identification du nom formel de l'attribut.
attributeValue	0..1	String	Valeur d'instance de l'attribut.
position	0..1	Integer	Valeur séquentielle représentant un numéro de séquence relatif.

Le Tableau 20 présente toutes les extrémités d'association de AttributeInstanceComponent avec d'autres classes.

Tableau 20 – Extrémités d'association de MarketManagement::AttributeInstanceComponent avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	TimeSeries	0..*	TimeSeries	
0..*	MarketDocument	0..*	MarketDocument	

6.4.4 Auction

Classe fournissant l'identification et le type d'une vente aux enchères.

Le Tableau 21 présente tous les attributs de Auction.

Tableau 21 – Attributs de MarketManagement::Auction

nom	mult	type	description
allocationMode	0..1	String	Identification de la méthode d'attribution dans une vente aux enchères.
cancelled	0..1	String	Indicateur spécifiant que la vente aux enchères a été annulée.
category	0..1	String	Catégorie de produit d'une vente aux enchères.
paymentTerms	0..1	String	Conditions régissant la détermination du prix d'offre.
rights	0..1	String	Droits d'utilisation de la capacité de transport acquise lors d'une vente aux enchères.

nom	mult	type	description
type	0..1	String	Type de vente aux enchères (par exemple: implicite, explicite...).
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 22 présente toutes les extrémités d'association de Auction avec d'autres classes.

Tableau 22 – Extrémités d'association de MarketManagement:: Auction avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	TimeSeries	0..*	TimeSeries	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.4.5 BidTimeSeries

Spécification formelle de caractéristiques spécifiques relatives à une offre.

Le Tableau 23 présente tous les attributs de BidTimeSeries.

Tableau 23 – Attributs de MarketManagement::BidTimeSeries

nom	mult	type	description
blockBid	0..1	String	Indique que les valeurs de la période sont considérées comme un ensemble. Elles ne peuvent être ni modifiées ni subdivisées.
direction	0..1	String	Identification codée du flux de l'énergie.
divisible	0..1	String	Indique si chaque élément de l'offre peut être accepté en partie ou non.
status	0..1	String	Information concernant le statut de l'offre, tel que "shared" (partagé), "restricted" (restreint), ...
linkedBidsIdentification	0..1	String	Identification unique associée à toutes les offres liées.
exclusiveBidsIdentification	0..1	String	Identification unique associée à toutes les offres liées. Identification d'un ensemble d'offres qui sont reliées ensemble signifiant que seule une offre peut être acceptée. L'identification est définie par le soumissionnaire et doit être unique pour une vente aux enchères donnée.
minimumActivationQuantity	0..1	Decimal	Quantité minimale d'énergie qui peut être activée à un intervalle de temps donné.

nom	mult	type	description
stepIncrementQuantity	0..1	Decimal	Incrément minimal qui peut s'appliquer à une augmentation lors une demande d'activation.
priority	0..1	Integer	Priorité numérique locale accordée à une offre. Les valeurs numériques inférieures ont une priorité supérieure.
businessType	0..1	String	Hérité de: TimeSeries
cancelledTS	0..1	String	Hérité de: TimeSeries
curveType	0..1	String	Hérité de: TimeSeries
objectAggregation	0..1	String	Hérité de: TimeSeries
product	0..1	String	Hérité de: TimeSeries
version	0..1	String	Hérité de: TimeSeries
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 24 présente toutes les extrémités d'association de BidTimeSeries avec d'autres classes.

**Tableau 24 – Extrémités d'association de MarketManagement::
BidTimeSeries avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	MarketParticipant	0..*	MarketParticipant	Hérité de: TimeSeries
0..*	EnvironmentalMonitoringStation	0..*	EnvironmentalMonitoringStation	Hérité de: TimeSeries
0..*	DateAndOrTime	0..*	DateAndOrTime	Hérité de: TimeSeries
0..*	Domain	0..*	Domain	Hérité de: TimeSeries
0..*	FlowDirection	0..*	FlowDirection	Hérité de: TimeSeries
0..*	MarketDocument	0..*	MarketDocument	Hérité de: TimeSeries
0..*	MarketEvaluationPoint	0..*	MarketEvaluationPoint	Hérité de: TimeSeries
0..*	Period	0..*	Period	Hérité de: TimeSeries
0..*	Reason	0..*	Reason	Hérité de: TimeSeries
0..*	RegisteredResource	0..*	RegisteredResource	Hérité de: TimeSeries
0..*	AttributeInstanceComponent	0..*	AttributeInstanceComponent	Hérité de: TimeSeries
0..*	Auction	0..*	Auction	Hérité de: TimeSeries
0..*	ConstraintDuration	0..*	ConstraintDuration	Hérité de: TimeSeries
0..*	MarketObjectStatus	0..*	MarketObjectStatus	Hérité de: TimeSeries
0..*	MktPSRType	0..*	MktPSRType	Hérité de: TimeSeries
0..*	Point	0..*	Point	Hérité de: TimeSeries
0..*	Price	0..*	Price	Hérité de: TimeSeries
0..*	Quantity	0..*	Quantity	Hérité de: TimeSeries
0..*	Unit	0..*	Unit	Hérité de: TimeSeries
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject

mult à partir de	nom	mult vers	type	description
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.4.6 Classe racine ConstraintDuration

Durée de contrainte à activer, à mettre en exploitation, à désactiver, ... dans un événement donné.

Le Tableau 25 présente tous les attributs de ConstraintDuration.

Tableau 25 – Attributs de MarketManagement::ConstraintDuration

nom	mult	type	description
duration	0..1	Duration	Durée de la contrainte.
type	0..1	String	Type de contrainte.

Le Tableau 26 présente toutes les extrémités d'association de ConstraintDuration avec d'autres classes.

Tableau 26 – Extrémités d'association de MarketManagement::ConstraintDuration avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	TimeSeries	0..*	TimeSeries	

6.4.7 Classe racine DateAndOrTime

La date et/ou l'heure.

Le Tableau 27 présente tous les attributs de DateAndOrTime.

Tableau 27 – Attributs de MarketManagement::DateAndOrTime

nom	mult	type	description
date	0..1	Date	Date sous la forme "aaaa-mm-jj", qui est conforme à l'ISO 8601.
time	0..1	Time	Heure sous la forme "hh:mm:ss.sssZ", qui est conforme à l'ISO 8601.

Le Tableau 28 présente toutes les extrémités d'association de DateAndOrTime avec d'autres classes.

Tableau 28 – Extrémités d'association de MarketManagement::DateAndOrTime avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MarketDocument	0..*	MarketDocument	
0..*	TimeSeries	0..*	TimeSeries	

6.4.8 Domain

Domaine d'activité défini dans le marché de l'énergie.

Le Tableau 29 présente tous les attributs de Domain.

Tableau 29 – Attributs de MarketManagement::Domain

nom	mult	type	description
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 30 présente toutes les extrémités d'association de Domain avec d'autres classes.

Tableau 30 – Extrémités d'association de MarketManagement::Domain avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..*	RegisteredResource	
0..*	MarketDocument	0..*	MarketDocument	
0..*	Price	0..*	Price	
0..*	TimeSeries	0..*	TimeSeries	
0..*	Quantity	0..*	Quantity	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.4.9 Classe racine FlowDirection

Identification codée du sens du flux de l'énergie.

Le Tableau 31 présente tous les attributs de FlowDirection.

Tableau 31 – Attributs de MarketManagement::FlowDirection

nom	type	description
direction	String	Identification codée du sens du flux de l'énergie.

Le Tableau 32 présente toutes les extrémités d'association de FlowDirection avec d'autres classes.

Tableau 32 – Extrémités d'association de MarketManagement::FlowDirection avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Point	0..*	Point	
0..*	TimeSeries	0..*	TimeSeries	

6.4.10 MarketAgreement

Identification ou éventuellement le contenu d'un accord entre au moins deux entités.

Le Tableau 33 présente tous les attributs de MarketAgreement.

Tableau 33 – Attributs de MarketManagement::MarketAgreement

nom	mult	type	description
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 34 présente toutes les extrémités d'association de MarketAgreement avec d'autres classes.

Tableau 34 – Extrémités d'association de MarketManagement::MarketAgreement avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	AttributeInstanceComponent	0..*	AttributeInstanceComponent	Hérité de: MarketDocument
0..*	Domain	0..*	Domain	Hérité de: MarketDocument
0..*	Period	0..*	Period	Hérité de: MarketDocument
0..*	SelfMarketDocument	0..*	MarketDocument	Hérité de: MarketDocument
0..*	MarketParticipant	0..*	MarketParticipant	Hérité de: MarketDocument
0..*	AceTariffType	0..*	AceTariffType	Hérité de: MarketDocument
0..*	DateAndOrTime	0..*	DateAndOrTime	Hérité de: MarketDocument
0..*	Reason	0..*	Reason	Hérité de: MarketDocument
0..*	TimeSeries	0..*	TimeSeries	Hérité de: MarketDocument
0..*	Process	0..*	Process	Hérité de: MarketDocument
0..*	MarketDocument	0..*	MarketDocument	Hérité de: MarketDocument
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.4.11 MarketDocument

Document électronique contenant les informations nécessaires pour satisfaire à un ensemble donné d'exigences de processus métier.

Le Tableau 35 présente tous les attributs de MarketDocument.

Tableau 35 – Attributs de MarketManagement::MarketDocument

nom	mult	type	description
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document

nom	mult	type	description
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 36 présente toutes les extrémités d'association de MarketDocument avec d'autres classes.

**Tableau 36 – Extrémités d'association de MarketManagement::
MarketDocument avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	AttributeInstanceComponent	0..*	AttributeInstanceComponent	
0..*	Domain	0..*	Domain	
0..*	Period	0..*	Period	
0..*	SelfMarketDocument	0..*	MarketDocument	
0..*	MarketParticipant	0..*	MarketParticipant	
0..*	AceTariffType	0..*	AceTariffType	
0..*	DateAndOrTime	0..*	DateAndOrTime	
0..*	Reason	0..*	Reason	
0..*	TimeSeries	0..*	TimeSeries	
0..*	Process	0..*	Process	
0..*	MarketDocument	0..*	MarketDocument	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.4.12 MarketEvaluationPoint

Identification d'une entité dans laquelle les produits énergétiques sont mesurés ou calculés.

Le Tableau 37 présente tous les attributs de MarketEvaluationPoint.

Tableau 37 – Attributs de MarketManagement::MarketEvaluationPoint

nom	mult	type	description
isSdp	0..1	Boolean	Hérité de: UsagePoint
isVirtual	0..1	Boolean	Hérité de: UsagePoint
phaseCode	0..1	PhaseCode	Hérité de: UsagePoint
grounded	0..1	Boolean	Hérité de: UsagePoint
servicePriority	0..1	String	Hérité de: UsagePoint
serviceDeliveryRemark	0..1	String	Hérité de: UsagePoint
estimatedLoad	0..1	CurrentFlow	Hérité de: UsagePoint
checkBilling	0..1	Boolean	Hérité de: UsagePoint
ratedCurrent	0..1	CurrentFlow	Hérité de: UsagePoint
nominalServiceVoltage	0..1	Voltage	Hérité de: UsagePoint
ratedPower	0..1	ActivePower	Hérité de: UsagePoint
outageRegion	0..1	String	Hérité de: UsagePoint
readCycle	0..1	String	Hérité de: UsagePoint
readRoute	0..1	String	Hérité de: UsagePoint
amiBillingReady	0..1	AmiBillingReadyKind	Hérité de: UsagePoint
connectionState	0..1	UsagePointConnectedKind	Hérité de: UsagePoint
minimalUsageExpected	0..1	Boolean	Hérité de: UsagePoint
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 38 présente toutes les extrémités d'association de MarketEvaluationPoint avec d'autres classes.

Tableau 38 – Extrémités d'association de MarketManagement::MarketEvaluationPoint avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	TimeSeries	0..*	TimeSeries	
0..*	Equipments	0..*	Equipment	Hérité de: UsagePoint
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: UsagePoint
0..*	ServiceCategory	0..1	ServiceCategory	Hérité de: UsagePoint
0..1	EndDevices	0..*	EndDevice	Hérité de: UsagePoint
0..1	ServiceMultipliers	0..*	ServiceMultiplier	Hérité de: UsagePoint
0..*	Outage	0..*	Outage	Hérité de: UsagePoint
0..*	Outage	0..*	Outage	Hérité de: UsagePoint
0..*	CustomerAgreement	0..1	CustomerAgreement	Hérité de: UsagePoint
0..*	PricingStructures	0..*	PricingStructure	Hérité de: UsagePoint
0..*	ServiceLocation	0..1	ServiceLocation	Hérité de: UsagePoint
0..*	EndDeviceControls	0..*	EndDeviceControl	Hérité de: UsagePoint
0..1	EndDeviceEvents	0..*	EndDeviceEvent	Hérité de: UsagePoint

mult à partir de	nom	mult vers	type	description
0..1	MeterReadings	0..*	MeterReading	Hérité de: UsagePoint
0..1	MeterServiceWorkTasks	0..*	MeterWorkTask	Hérité de: UsagePoint
0..*	MetrologyRequirements	0..*	MetrologyRequirement	Hérité de: UsagePoint
0..*	ServiceSupplier	0..1	ServiceSupplier	Hérité de: UsagePoint
0..*	UsagePointGroups	0..*	UsagePointGroup	Hérité de: UsagePoint
0..*	UsagePointLocation	0..1	UsagePointLocation	Hérité de: UsagePoint
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.4.13 Classe racine MarketObjectStatus

Condition ou position d'un objet par rapport à son statut.

Le Tableau 39 présente tous les attributs de MarketObjectStatus.

Tableau 39 – Attributs de MarketManagement::MarketObjectStatus

nom	mult	type	description
status	0..1	String	Condition ou position codée d'un objet par rapport à son statut.

Le Tableau 40 présente toutes les extrémités d'association de MarketObjectStatus avec d'autres classes.

Tableau 40 – Extrémités d'association de MarketManagement::MarketObjectStatus avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..*	RegisteredResource	
0..*	TimeSeries	0..*	TimeSeries	

6.4.14 MktPSRType

Type de ressource du système électrique.

Le Tableau 41 présente tous les attributs de MktPSRType.

Tableau 41 – Attributs de MarketManagement::MktPSRType

nom	mult	type	description
psrType	0..1	String	Type codé de ressource de système électrique.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 42 présente toutes les extrémités d'association de MktPSRType avec d'autres classes.

Tableau 42 – Extrémités d'association de MarketManagement::MktPSRType avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	TimeSeries	0..*	TimeSeries	
0..1	PowerSystemResources	0..*	PowerSystemResource	Hérité de: PSRType
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.4.15 Classe racine Period

Identification d'un intervalle de temps qui peut avoir une résolution donnée.

Le Tableau 43 présente tous les attributs de Period.

Tableau 43 – Attributs de MarketManagement::Period

nom	mult	type	description
resolution	0..1	Duration	Nombre d'unités de temps qui composent une étape individuelle dans une période.
timeInterval	0..1	DateTimeInterval	Date et heure de début et de fin d'un intervalle donné.

Le Tableau 44 présente toutes les extrémités d'association de Period avec d'autres classes.

Tableau 44 – Extrémités d'association de MarketManagement::Period avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Reason	0..*	Reason	
0..*	MarketDocument	0..*	MarketDocument	
1..1	Point	0..*	Point	
0..*	TimeSeries	0..*	TimeSeries	

6.4.16 Classe racine Point

Identification d'un ensemble de valeurs traitées dans un intervalle de temps spécifique.

Le Tableau 45 présente tous les attributs de Point.

Tableau 45 – Attributs de MarketManagement::Point

nom	mult	type	description
position	0..1	Integer	Valeur séquentielle représentant la position relative dans un intervalle de temps donné.
quality	0..1	String	Qualité de l'information fournie. Cette qualité peut être estimée, non disponible, telle que fournie, etc.
quantity	0..1	Decimal	Quantité principale identifiée à un point.
secondaryQuantity	0..1	Decimal	Quantité secondaire identifiée à un point.

Le Tableau 46 présente toutes les extrémités d'association de Point avec d'autres classes.

Tableau 46 – Extrémités d'association de MarketManagement::Point avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	AceTariffType	0..*	AceTariffType	
0..*	Period	1..1	Period	
0..*	TimeSeries	0..*	TimeSeries	
0..*	FlowDirection	0..*	FlowDirection	
0..1	Price	0..*	Price	
0..*	Reason	0..*	Reason	
0..*	Quantity	0..*	Quantity	

6.4.17 Classe racine Price

Coût correspondant à une mesure spécifique et exprimé dans une devise.

Le Tableau 47 présente tous les attributs de Price.

Tableau 47 – Attributs de MarketManagement::Price

nom	mult	type	description
amount	0..1	Decimal	Nombre d'unités monétaires spécifié dans une unité monétaire.
category	0..1	String	Catégorie de prix à utiliser pour calculer un prix. La catégorie de prix est définie par accord mutuel entre les opérateurs du système.
direction	0..1	String	Le sens indique si un opérateur du système paie les entités du marché ou inversement.

Le Tableau 48 présente toutes les extrémités d'association de Price avec d'autres classes.

**Tableau 48 – Extrémités d'association de MarketManagement::
Price avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	Domain	0..*	Domain	
0..*	Point	0..1	Point	
0..*	TimeSeries	0..*	TimeSeries	

6.4.18 Process

Spécification formelle d'un ensemble de transactions commerciales ayant le même objectif.

Le Tableau 49 présente tous les attributs de Process.

Tableau 49 – Attributs de MarketManagement::Process

nom	mult	type	description
classificationType	0..1	String	Mécanisme de classification utilisé pour regrouper un ensemble d'objets dans un processus métier. Le regroupement peut être détaillé ou résumé.
processType	0..1	String	Type de processus métier.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 50 présente toutes les extrémités d'association de Process avec d'autres classes.

**Tableau 50 – Extrémités d'association de MarketManagement::
Process avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	MarketDocument	0..*	MarketDocument	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.4.19 Classe racine Quantity

Description des quantités nécessaires à l'échange de données.

Le type de quantité est décrit soit par le rôle de l'association, soit par l'attribut Type.

L'attribut Quality fournit les informations relatives à la qualité de la quantité (mesurée, estimée, etc.).

Le Tableau 51 présente tous les attributs de Quantity.

Tableau 51 – Attributs de MarketManagement::Quantity

nom	mult	type	description
quantity	0..1	Decimal	Valeur de quantité. Le rôle de l'association fournit les informations relatives à ce qui est exprimé.
type	0..1	String	Description du type de quantité.
quality	0..1	String	Qualité des informations fournies. Cette qualité peut être estimée, non disponible, telle que fournie, etc.

Le Tableau 52 présente toutes les extrémités d'association de Quantity avec d'autres classes.

Tableau 52 – Extrémités d'association de MarketManagement::Quantity avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Domain	0..*	Domain	
0..*	Point	0..*	Point	
0..*	TimeSeries	0..*	TimeSeries	
0..*	Quantity	0..1	Quantity	
0..1	Detail_Quantity	0..*	Quantity	Informations supplémentaires relatives à la quantité associée.

6.4.20 Classe racine Reason

Motivation d'un acte.

Le Tableau 53 présente tous les attributs de Reason.

Tableau 53 – Attributs de MarketManagement::Reason

nom	mult	type	description
code	0..1	String	Motivation d'un acte sous forme codée.
text	0..1	String	Explication textuelle correspondant au code de cause.

Le Tableau 54 présente toutes les extrémités d'association de Reason avec d'autres classes.

Tableau 54 – Extrémités d'association de MarketManagement::Reason avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MarketDocument	0..*	MarketDocument	
0..*	Point	0..*	Point	
0..*	RegisteredResource	0..*	RegisteredResource	
0..*	Period	0..*	Period	
0..*	TimeSeries	0..*	TimeSeries	

6.4.21 Series

Ensemble d'objets physiques ou conceptuels définis pour la même période ou le même instant.

Le Tableau 55 présente tous les attributs de Series.

Tableau 55 – Attributs de MarketManagement::Series

nom	mult	type	description
lastUpdateDate	0..1	Date	Date de la dernière mise à jour relative à cet objet du marché.
methodType	0..1	String	Type de méthode employée dans le processus de métier lié à cette Series; par exemple: méthode de comptage.
registrationDate	0..1	Date	Pour un objet de marché, date d'enregistrement d'un contrat; par exemple, date de changement de fournisseur pour un client.
businessType	0..1	String	Hérité de: TimeSeries
cancelledTS	0..1	String	Hérité de: TimeSeries
curveType	0..1	String	Hérité de: TimeSeries
objectAggregation	0..1	String	Hérité de: TimeSeries
product	0..1	String	Hérité de: TimeSeries
version	0..1	String	Hérité de: TimeSeries
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 56 présente toutes les extrémités d'association de Series avec d'autres classes.

Tableau 56 – Extrémités d'association de MarketManagement::Series avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	SelfSeries	0..*	Series	
0..*	Series	0..*	Series	
0..*	MarketParticipant	0..*	MarketParticipant	Hérité de: TimeSeries
0..*	EnvironmentalMonitoringStation	0..*	EnvironmentalMonitoringStation	Hérité de: TimeSeries
0..*	DateAndOrTime	0..*	DateAndOrTime	Hérité de: TimeSeries
0..*	Domain	0..*	Domain	Hérité de: TimeSeries
0..*	FlowDirection	0..*	FlowDirection	Hérité de: TimeSeries
0..*	MarketDocument	0..*	MarketDocument	Hérité de: TimeSeries
0..*	MarketEvaluationPoint	0..*	MarketEvaluationPoint	Hérité de: TimeSeries
0..*	Period	0..*	Period	Hérité de: TimeSeries
0..*	Reason	0..*	Reason	Hérité de: TimeSeries
0..*	RegisteredResource	0..*	RegisteredResource	Hérité de: TimeSeries

mult à partir de	nom	mult vers	type	description
0..*	AttributeInstanceComponent	0..*	AttributeInstanceComponent	Hérité de: TimeSeries
0..*	Auction	0..*	Auction	Hérité de: TimeSeries
0..*	ConstraintDuration	0..*	ConstraintDuration	Hérité de: TimeSeries
0..*	MarketObjectStatus	0..*	MarketObjectStatus	Hérité de: TimeSeries
0..*	MktPSRType	0..*	MktPSRType	Hérité de: TimeSeries
0..*	Point	0..*	Point	Hérité de: TimeSeries
0..*	Price	0..*	Price	Hérité de: TimeSeries
0..*	Quantity	0..*	Quantity	Hérité de: TimeSeries
0..*	Unit	0..*	Unit	Hérité de: TimeSeries
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.4.22 TimeSeries

Série Chronologique, ensemble de mesures chronologiques ordinaires ou de valeurs quantitatives d'un phénomène individuel ou collectif pris à des périodes/instants successifs, et souvent, équidistants.

Le Tableau 57 présente tous les attributs de TimeSeries.

Tableau 57 – Attributs de MarketManagement::TimeSeries

nom	mult	type	description
businessType	0..1	String	Identification de la nature de la série chronologique.
cancelledTS	0..1	String	Indicateur selon lequel la TimeSeries, identifiée par le mRID, ainsi que toutes les valeurs envoyées dans une version précédente de la TimeSeries dans un document précédent, sont annulées.
curveType	0..1	String	Représentation codée du type de courbe décrit.
objectAggregation	0..1	String	Identification de l'objet qui est le dénominateur commun utilisé pour agréger une série chronologique.
product	0..1	String	Type de produit, tel que la puissance, l'énergie, la puissance réactive, la capacité de transport, qui fait l'objet de la série chronologique.
version	0..1	String	Version de la série chronologique.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 58 présente toutes les extrémités d'association de TimeSeries avec d'autres classes.

Tableau 58 – Extrémités d'association de MarketManagement::TimeSeries avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MarketParticipant	0..*	MarketParticipant	
0..*	EnvironmentalMonitoringStation	0..*	EnvironmentalMonitoringStation	
0..*	DateAndOrTime	0..*	DateAndOrTime	
0..*	Domain	0..*	Domain	
0..*	FlowDirection	0..*	FlowDirection	
0..*	MarketDocument	0..*	MarketDocument	
0..*	MarketEvaluationPoint	0..*	MarketEvaluationPoint	
0..*	Period	0..*	Period	
0..*	Reason	0..*	Reason	
0..*	RegisteredResource	0..*	RegisteredResource	
0..*	AttributeInstanceComponent	0..*	AttributeInstanceComponent	
0..*	Auction	0..*	Auction	
0..*	ConstraintDuration	0..*	ConstraintDuration	
0..*	MarketObjectStatus	0..*	MarketObjectStatus	
0..*	MktPSRType	0..*	MktPSRType	
0..*	Point	0..*	Point	
0..*	Price	0..*	Price	
0..*	Quantity	0..*	Quantity	
0..*	Unit	0..*	Unit	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.4.23 Classe racine Unit

Identification du nom de l'unité pour les grandeurs de série chronologique.

Le Tableau 59 présente tous les attributs de Unit.

Tableau 59 – Attributs de MarketManagement::Unit

nom	mult	type	description
name	0..1	String	Représentation codée de l'unité.

Le Tableau 60 présente toutes les extrémités d'association de Unit avec d'autres classes.

**Tableau 60 – Extrémités d'association de MarketManagement::
Unit avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	TimeSeries	0..*	TimeSeries	
0..*	AceTariffType	0..*	AceTariffType	

6.5 Paquetage MarketOperations

6.5.1 Généralités

Ce paquetage contient toutes les principales extensions de marché du CIM exigées pour les systèmes des opérations du marché.

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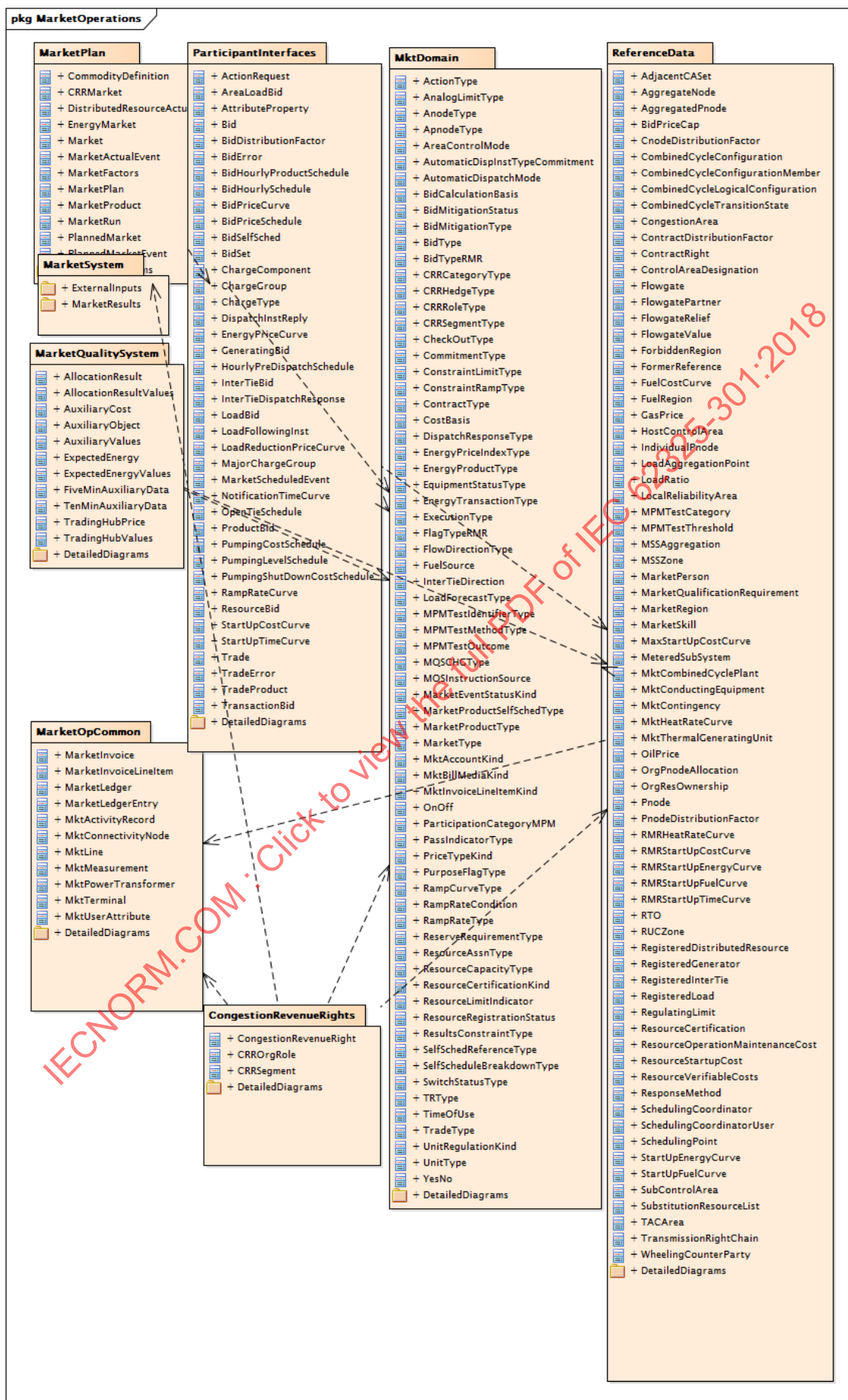
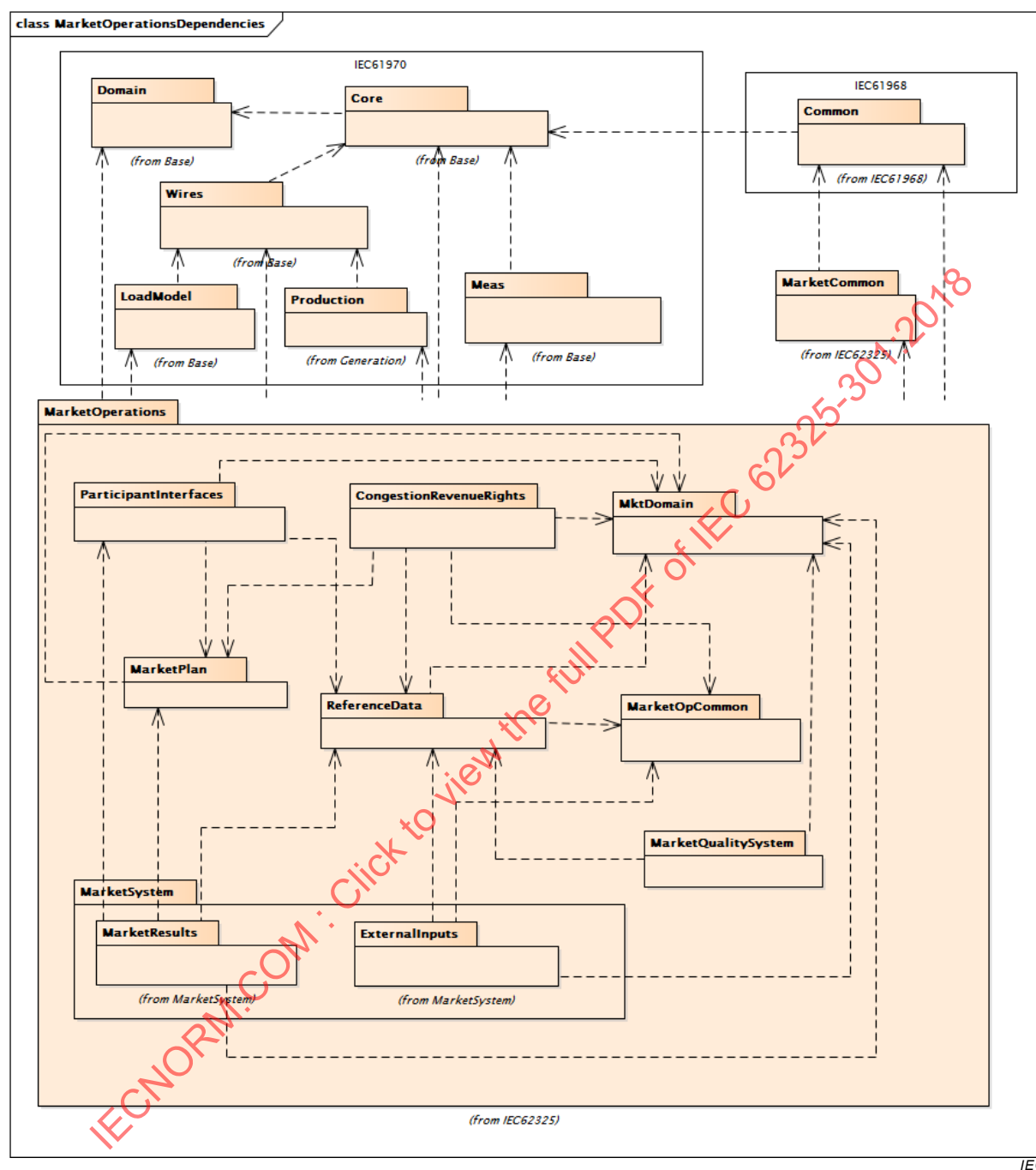


Figure 32 – Diagramme de paquetage MarketOperations::MarketOperations

Figure 32: représente le paquetage contenant toutes les principales extensions de marché du CIM exigées pour les systèmes des opérations du marché.



Anglais	Français
from	provenant de

Figure 33 – Diagramme de classe MarketOperations::MarketOperationsDependencies

Figure 33: représente les dépendances des opérations du marché internes au paquetage et dépendances externes.

6.5.2 Paquetage CongestionRevenueRights

6.5.2.1 Généralités

Les frais de congestion sont une charge importante et très volatile qui concerne aujourd'hui de nombreux participants dans les marchés de l'énergie électrique basés sur les prix marginaux locaux (LMP). Pour cette raison, les ISO offrent des droits à revenu de congestion (CRR), également appelées droits de transport financiers ou contrats de congestion de transport. Ce sont des instruments financiers qui permettent aux participants du marché de se couvrir des frais de congestion lors de la programmation des transactions de production, de charge et d'énergie bilatérales.

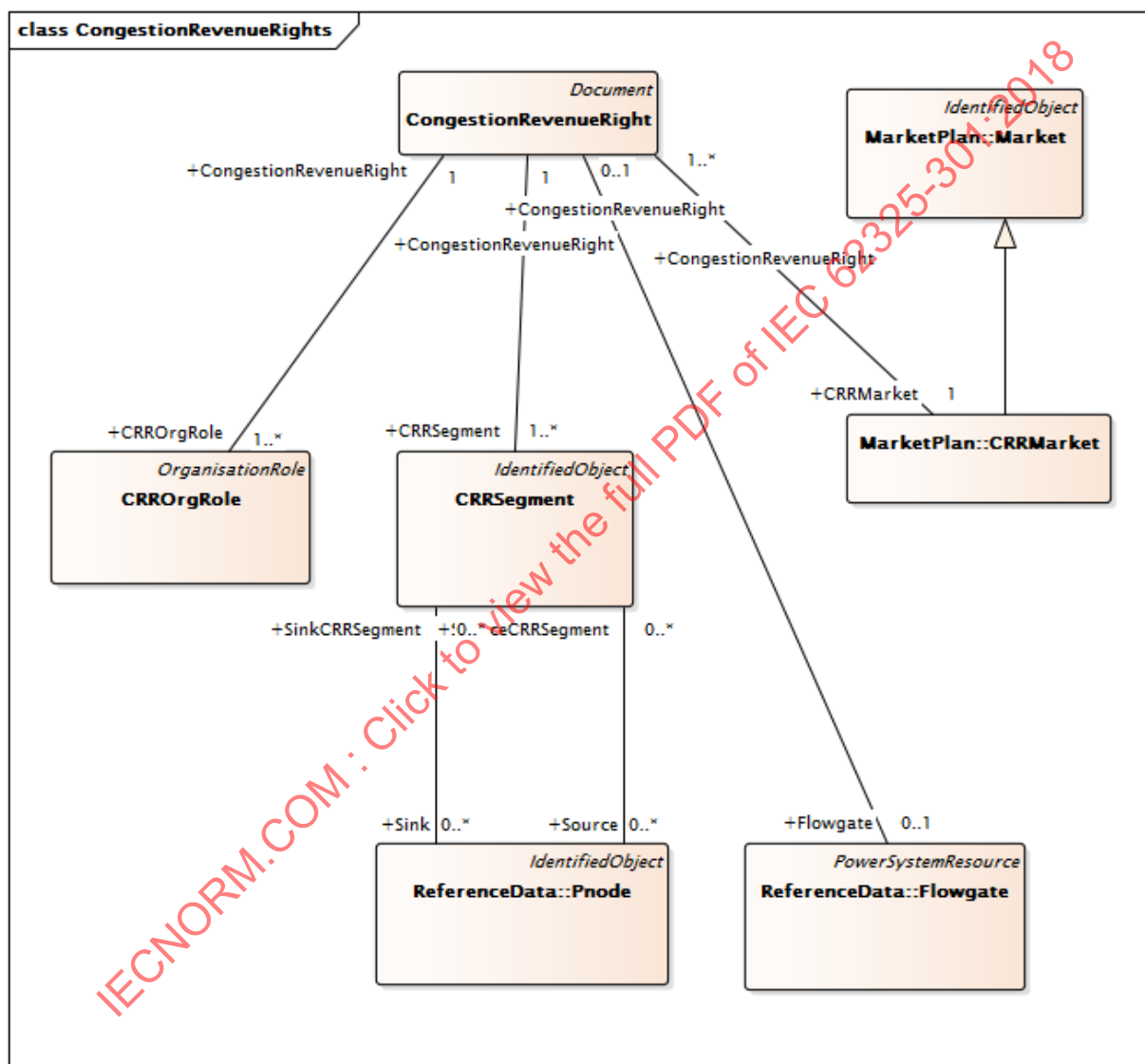


**Figure 34 – Diagramme de classe
CongestionRevenueRights::CongestionRevenueRights**

Figure 34: représente un droit à revenu de congestion (CRR) qui est un instrument financier qui permet à son détenteur de recevoir un versement de CRR lorsque la congestion s'effectue de la source vers la source de CRR vers le puits de CRR. Les classes représentées sont utilisées pour modéliser les données de CRR. La classe CRRSegment contient des informations sur les segments de CRR. La classe MktOrganization contient des informations sur l'entité qui détient la CRR. Les associations de CRRSegment vers ReferenceData mettent en évidence la source et le puits Pnodes.

6.5.2.2 CongestionRevenueRight

Classe de droit à revenu de congestion (CRR) héritée de la classe Document.

Une CRR est un concept financier qui est utilisé pour se couvrir des frais de congestion.

La CRR est généralement réglée selon les prix marginaux locaux (LMP) qui sont calculés dans le marché à J-1. Ces LMP sont définis par les programmes/offres des ressources à J-1. Les CRR ne couvriront pas les pertes marginales. Si le composant de congestion du LMP au puits est supérieur à celui à la source, le propriétaire de la CRR est en droit de recevoir une partie des revenus de congestion. Si le composant de congestion au puits est inférieur à celui à la source, alors le propriétaire de CRR sous forme d'obligations sera facturé, tandis que le propriétaire de CRR sous forme d'options ne le sera pas.

Le Tableau 61 présente tous les attributs de CongestionRevenueRight.

Tableau 61 – Attributs de CongestionRevenueRights:: CongestionRevenueRight

nom	mult	type	description
cRRcategory	0..1	CRRCategoryType	Catégorie de CRR définie sur "PTP" (<i>point-to-point</i>) pour une CRR point à point ou sur "NSR" (<i>Network Service Right</i>) pour un droit de service réseau. Si la catégorie de CRR est "PTP", les champs ID source et ID puits sont exigés. Si la catégorie de CRR est "NSR", un champ (ID source ou ID puits) doit être défini sur zéro et l'autre ne doit pas être défini sur zéro. Cependant, la catégorie "NSR" comprendra au moins trois enregistrements.
cRRtype	0..1	CRRSegmentType	Type de CRR, dans les définitions types possibles du système de CRR (par exemple, "LSE", "ETC").
hedgeType	0..1	CRRHedgeType	Type de couverture. Obligation ou Option. La couverture Obligation exige que le détenteur reçoive ou paie des frais de congestion. La couverture Option donne au détenteur le choix de recevoir ou de payer les frais de congestion.
timeOfUse	0..1	TimeOfUse	Indicateur des heures d'utilisation de la CRR – heures de pointe (ON), heures creuses (OFF) ou 24 h/24 (24HR).
tradeSliceID	0..1	String	Segment de la CRR décrit dans l'enregistrement actuel.
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 62 présente toutes les extrémités d'association de CongestionRevenueRight avec d'autres classes.

Tableau 62 – Extrémités d'association de CongestionRevenueRights:: CongestionRevenueRight avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	Flowgate	0..1	Flowgate	
1..*	CRRMarket	1..1	CRRMarket	
1..1	CRRSegment	1..*	CRRSegment	
1..1	CRROrgRole	1..*	CRROrgRole	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.2.3 CRROrgRole

Identifie comment une organisation peut participer avec un droit à revenu de congestion défini (CRR).

Le Tableau 63 présente tous les attributs de CRROrgRole.

Tableau 63 – Attributs de CongestionRevenueRights::CRROrgRole

nom	mult	type	description
kind	0..1	CRRRoleType	Type de rôle de l'organisation quant aux droits à revenu de congestion.
status	0..1	Status	Statut du rôle de l'organisation quant aux droits à revenu de congestion.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 64 présente toutes les extrémités d'association de CRROrgRole avec d'autres classes.

Tableau 64 – Extrémités d'association de CongestionRevenueRights::CRROrgRole avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	CongestionRevenueRight	1..1	CongestionRevenueRight	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: OrganisationRole
0..*	Organisation	0..1	Organisation	Hérité de: OrganisationRole
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.2.4 CRRSegment

CRRSegment représente un segment de la CRR dans un cadre temporel particulier.

La classe de segment contient le montant, le prix d'équilibre, la date et l'heure de début et la date et l'heure de fin.

Le Tableau 65 présente tous les attributs de CRRSegment.

Tableau 65 – Attributs de CongestionRevenueRights::CRRSegment

nom	mult	type	description
amount	0..1	Money	Montant en dollars = quantité x clearingPrice
clearingPrice	0..1	Money	Prix d'équilibre d'une CRR
endDateTime	0..1	DateTime	Date et heure de fin de segment
quantity	0..1	Float	Quantité de MW associée à la CRR
startDateTime	0..1	DateTime	Date et heure de début de segment
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 66 présente toutes les extrémités d'association de CRRSegment avec d'autres classes.

Tableau 66 – Extrémités d'association de CongestionRevenueRights::CRRSegment avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	CongestionRevenueRight	1..1	CongestionRevenueRight	
0..*	Source	0..*	Pnode	
0..*	Sink	0..*	Pnode	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.3 Packaging MarketOpCommon

6.5.3.1 Généralités

Ce packaging contient les objets communs partagés par les packagings MarketOperations.

6.5.3.2 Classe racine MarketInvoice

Ensemble des éléments de ligne d'une facture. Toutes les factures comportent une échéance, un montant à régler et des informations (client, banques, etc.) obtenues grâce à des associations. L'ensemble de la facture est fondé sur des éléments de ligne individuels, qui contiennent chacun des montants et des descriptions pour des services ou produits spécifiques.

Le Tableau 67 présente tous les attributs de MarketInvoice.

Tableau 67 – Attributs de MarketOpCommon::MarketInvoice

nom	mult	type	description
amount	0..1	Money	Montant total à régler sur cette facture basé sur les éléments de ligne et les ajustements applicables.
billMediaKind	0..1	MktBillMediaKind	Type de support utilisé pour fournir les CustomerBillingInfo.
dueDate	0..1	Date	Date calculée à partir de laquelle le montant de la facture est dû.
kind	0..1	MktAccountKind	Type de facture ("vente" par défaut).
mailedDate	0..1	Date	Date à laquelle le relevé de facturation/la facture client a été imprimé/envoyé par courrier.
proForma	0..1	Boolean	True si le paiement doit être réglé par le client pour accepter un ErpQuote particulier (avec la conception associée) et lancer le travail, au moment où il convient de générer automatiquement un ErpInvoice associé. ErpPayment.subjectStatus satisfait aux conditions spécifiées dans ErpQuote.
referenceNumber	0..1	String	Numéro de facture référencé par cette facture.
transactionDateTime	0..1	DateTime	Date et heure d'émission de la facture.
transferType	0..1	String	Type de transfert de facture.

Le Tableau 68 présente toutes les extrémités d'association de MarketInvoice avec d'autres classes.

Tableau 68 – Extrémités d'association de MarketOpCommon::MarketInvoice avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MajorChargeGroup	1..*	MajorChargeGroup	
1..1	MarketInvoiceLineItems	0..*	MarketInvoiceLineItem	

6.5.3.3 Classe racine MarketInvoiceLineItem

Élément de ligne individuel sur une facture.

Le Tableau 69 présente tous les attributs de MarketInvoiceLineItem.

Tableau 69 – Attributs de MarketOpCommon::MarketInvoiceLineItem

nom	mult	type	description
billPeriod	0..1	DateTimeInterval	Période de facturation de l'élément de ligne.
glAccount	0..1	String	Le code de facturation du grand livre général doit être une combinaison valide.
glDateTime	0..1	DateTime	Les éléments de ligne de date et d'heure seront publiés dans le grand livre général.
kind	0..1	MktInvoiceLineItemKind	Type d'élément de ligne.
lineAmount	0..1	Float	Montant dû pour cet élément de ligne.
lineNumber	0..1	String	Numéro d'élément de ligne sur le relevé de facturation.
lineVersion	0..1	String	Numéro de version de la facture.
netAmount	0..1	Float	Montant net des charges de l'élément de ligne.
previousAmount	0..1	Float	Montant précédent des charges de l'élément de ligne.

Le Tableau 70 présente toutes les extrémités d'association de MarketInvoiceLineItem avec d'autres classes.

Tableau 70 – Extrémités d'association de MarketOpCommon::MarketInvoiceLineItem avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MarketInvoice	1..1	MarketInvoice	
0..*	Settlement	0..*	Settlement	
0..*	ContainerMarketInvoiceLineItem	0..1	MarketInvoiceLineItem	
0..1	ComponentMarketInvoiceLineItems	0..*	MarketInvoiceLineItem	

6.5.3.4 Classe racine MarketLedger

Dans les transactions de comptabilité, un grand livre est un registre contenant les comptes sur lesquels des débits et des crédits sont publiés depuis des journaux, dans lesquels des

transactions sont enregistrées au préalable. Les entrées du journal sont régulièrement publiées sur le grand livre. Le grand livre réel contient les montants réels des comptes d'une société ou d'un secteur de marché. Les montants réels peuvent être générés dans une application source, puis chargés dans un grand livre spécifique appartenant au grand livre général ou à l'application budgétaire d'une entreprise.

Le Tableau 71 présente toutes les extrémités d'association de MarketLedger avec d'autres classes.

Tableau 71 – Extrémités d'association de MarketOpCommon::MarketLedger avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	MarketLedgerEntries	0..*	MarketLedgerEntry	

6.5.3.5 Classe racine MarketLedgerEntry

Détails d'une entrée individuelle dans un grand livre provenant d'un journal à la date attribuée.

Le Tableau 72 présente tous les attributs de MarketLedgerEntry.

Tableau 72 – Attributs de MarketOpCommon::MarketLedgerEntry

nom	mult	type	description
accountID	0..1	String	Identifiant de compte de cette entrée.
accountKind	0..1	MktAccountKind	Type de compte de cette entrée.
amount	0..1	Money	Montant du débit/crédit de ce compte.
postedDateTime	0..1	DateTime	Date et heure auxquelles cette entrée a été publiée sur le grand livre.
status	0..1	Status	Statut de l'entrée du grand livre.
transactionDateTime	0..1	DateTime	Date et heure de l'enregistrement de l'entrée du journal.

Le Tableau 73 présente toutes les extrémités d'association de MarketLedgerEntry avec d'autres classes.

Tableau 73 – Extrémités d'association de MarketOpCommon::MarketLedgerEntry avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Settlement	0..*	Settlement	
0..*	MarketLedger	1..1	MarketLedger	

6.5.3.6 MktActivityRecord

Sous-classe de IEC61968:Common:ActivityRecord

Le Tableau 74 présente tous les attributs de MktActivityRecord.

Tableau 74 – Attributs de MarketOpCommon::MktActivityRecord

nom	mult	type	description
createdDateTime	0..1	DateTime	Hérité de: ActivityRecord
type	0..1	String	Hérité de: ActivityRecord
severity	0..1	String	Hérité de: ActivityRecord
reason	0..1	String	Hérité de: ActivityRecord
status	0..1	Status	Hérité de: ActivityRecord
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 75 présente toutes les extrémités d'association de MktActivityRecord avec d'autres classes.

Tableau 75 – Extrémités d'association de MarketOpCommon::MktActivityRecord avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MarketFactors	0..*	MarketFactors	
0..*	Assets	0..*	Asset	Hérité de: ActivityRecord
0..*	Author	0..1	Author	Hérité de: ActivityRecord
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.3.7 MktConnectivityNode

Sous-classe de IEC61970:Topology:ConnectivityNode

Le Tableau 76 présente tous les attributs de MktConnectivityNode.

Tableau 76 – Attributs de MarketOpCommon::MktConnectivityNode

nom	mult	type	description
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 77 présente toutes les extrémités d'association de MktConnectivityNode avec d'autres classes.

Tableau 77 – Extrémités d'association de MarketOpCommon::MktConnectivityNode avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	RegisteredResource	0..*	RegisteredResource	
1..1	NodeConstraintTerm	0..*	NodeConstraintTerm	
0..*	RTO	1..1	RTO	
1..1	SysLoadDistribuFactor	0..1	SysLoadDistributionFactor	
1..1	LossPenaltyFactor	0..*	LossSensitivity	
1..1	CnodeDistributionFactor	0..*	CnodeDistributionFactor	
1..1	IndividualPnode	0..1	IndividualPnode	
0..*	TopologicalNode	0..1	TopologicalNode	Hérité de: ConnectivityNode
0..*	ConnectivityNodeContainer	1..1	ConnectivityNodeContainer	Hérité de: ConnectivityNode
0..1	Terminals	0..*	Terminal	Hérité de: ConnectivityNode
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.3.8 MktLine

Sous-classe de IEC61970:Wires:Line

Le Tableau 78 présente tous les attributs de MktLine.

Tableau 78 – Attributs de MarketOpCommon::MktLine

nom	mult	type	description
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 79 présente toutes les extrémités d'association de MktLine avec d'autres classes.

Tableau 79 – Extrémités d'association de MarketOpCommon::MktLine avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Flowgate	0..*	Flowgate	
0..*	Region	0..1	SubGeographicalRegion	Hérité de: Line
0..1	Equipments	0..*	Equipment	Hérité de: EquipmentContainer
0..*	AdditionalGroupedEquipment	0..*	Equipment	Hérité de: EquipmentContainer
1..1	ConnectivityNodes	0..*	ConnectivityNode	Hérité de: ConnectivityNodeContainer
0..1	TopologicalNode	0..*	TopologicalNode	Hérité de: ConnectivityNodeContainer
0..*	PSRType	0..1	PSRType	Hérité de: PowerSystemResource
0..1	Controls	0..*	Control	Hérité de: PowerSystemResource
0..1	Measurements	0..*	Measurement	Hérité de: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	Hérité de: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	Hérité de: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.3.9 MktMeasurement

Sous-classe de IEC61970:Meas:Measurement

Le Tableau 80 présente tous les attributs de MktMeasurement.

Tableau 80 – Attributs de MarketOpCommon::MktMeasurement

nom	mult	type	description
measurementType	0..1	String	Hérité de: Measurement
phases	0..1	PhaseCode	Hérité de: Measurement
uncefactUnitCode	1..1	UncefactUnitCode	Hérité de: Measurement
unitMultiplier	0..1	UnitMultiplier	Hérité de: Measurement
unitSymbol	0..1	UnitSymbol	Hérité de: Measurement
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 81 présente toutes les extrémités d'association de MktMeasurement avec d'autres classes.

Tableau 81 – Extrémités d'association de MarketOpCommon::MktMeasurement avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Pnode	0..1	Pnode	Permet à Pnode de s'associer aux mesures d'interconnexions à courant continu externes des ressources agrégées ou de pseudo-interconnexions.
0..*	Terminal	0..1	ACDCTerminal	Hérité de: Measurement
0..*	PowerSystemResource	0..1	PowerSystemResource	Hérité de: Measurement
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.3.10 MktPowerTransformer

Sous-classe de IEC61970:Wires:PowerTransformer

Le Tableau 82 présente tous les attributs de MktPowerTransformer.

Tableau 82 – Attributs de MarketOpCommon::MktPowerTransformer

nom	mult	type	description
beforeShCircuitHighestOperatingCurrent	0..1	CurrentFlow	Hérité de: PowerTransformer
beforeShCircuitHighestOperatingVoltage	0..1	Voltage	Hérité de: PowerTransformer
beforeShortCircuitAnglePf	0..1	AngleDegrees	Hérité de: PowerTransformer
highSideMinOperatingU	0..1	Voltage	Hérité de: PowerTransformer
isPartOfGeneratorUnit	0..1	Boolean	Hérité de: PowerTransformer
operationalValuesConsidered	0..1	Boolean	Hérité de: PowerTransformer
vectorGroup	0..1	String	Hérité de: PowerTransformer
aggregate	0..1	Boolean	Hérité de: Equipment
inService	0..1	Boolean	Hérité de: Equipment
networkAnalysisEnabled	0..1	Boolean	Hérité de: Equipment
normallyInService	0..1	Boolean	Hérité de: Equipment
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 83 présente toutes les extrémités d'association de MktPowerTransformer avec d'autres classes.

**Tableau 83 – Extrémités d'association de MarketOpCommon::
MktPowerTransformer avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	Flowgate	0..*	Flowgate	
0..*	EndBFlow	0..1	BranchEndFlow	
0..*	EndAFlow	0..1	BranchEndFlow	
0..1	PowerTransformerEnd	0..*	PowerTransformerEnd	Hérité de: PowerTransformer
0..1	TransformerTanks	0..*	TransformerTank	Hérité de: PowerTransformer
0..*	BaseVoltage	0..1	BaseVoltage	Hérité de: ConductingEquipment
1..1	SvStatus	0..*	SvStatus	Hérité de: ConductingEquipment
0..*	ProtectionEquipments	0..*	ProtectionEquipment	Hérité de: ConductingEquipment
1..1	Terminals	0..*	Terminal	Hérité de: ConductingEquipment
0..1	OperationalLimitSet	0..*	OperationalLimitSet	Hérité de: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	Hérité de: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	Hérité de: Equipment
0..1	Faults	0..*	Fault	Hérité de: Equipment
0..*	AdditionalEquipmentContained	0..*	EquipmentContainer	Hérité de: Equipment
0..*	PSRType	0..1	PSRType	Hérité de: PowerSystemResource
0..1	Controls	0..*	Control	Hérité de: PowerSystemResource
0..1	Measurements	0..*	Measurement	Hérité de: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	Hérité de: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	Hérité de: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.3.11 MktTerminal

Sous-classe de IEC61970:Core:Terminal

Le Tableau 84 présente tous les attributs de MktTerminal.

Tableau 84 – Attributs de MarketOpCommon::MktTerminal

nom	mult	type	description
phases	0..1	PhaseCode	Hérité de: Terminal
connected	0..1	Boolean	Hérité de: ACDCTerminal
sequenceNumber	0..1	Integer	Hérité de: ACDCTerminal
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 85 présente toutes les extrémités d'association de MktTerminal avec d'autres classes.

Tableau 85 – Extrémités d'association de MarketOpCommon::MktTerminal avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Flowgate	0..1	Flowgate	
1..1	TerminalConstraintTerm	0..*	TerminalConstraintTerm	
0..*	ConductingEquipment	1..1	ConductingEquipment	Hérité de: Terminal
0..*	ConnectivityNode	0..1	ConnectivityNode	Hérité de: Terminal
0..*	TopologicalNode	0..1	TopologicalNode	Hérité de: Terminal
0..1	RegulatingControl	0..*	RegulatingControl	Hérité de: Terminal
1..*	NormaHeadFeeder	0..1	Feeder	Hérité de: Terminal
1..1	HasFirstMutualCoupling	0..*	MutualCoupling	Hérité de: Terminal
0..1	TransformerEnd	0..*	TransformerEnd	Hérité de: Terminal
1..1	BranchGroupTerminal	0..*	BranchGroupTerminal	Hérité de: Terminal
1..1	SvPowerFlow	0..*	SvPowerFlow	Hérité de: Terminal
1..1	AuxiliaryEquipment	0..*	AuxiliaryEquipment	Hérité de: Terminal
1..1	HasSecondMutualCoupling	0..*	MutualCoupling	Hérité de: Terminal
1..1	TieFlow	0..2	TieFlow	Hérité de: Terminal
0..1	EquipmentFaults	0..*	EquipmentFault	Hérité de: Terminal
0..1	ConverterDCSides	0..*	ACDCConverter	Hérité de: Terminal
1..1	RemoteInputSignal	0..*	RemoteInputSignal	Hérité de: Terminal
1..*	BusNameMarker	0..1	BusNameMarker	Hérité de: ACDCTerminal
0..1	OperationalLimitSet	0..*	OperationalLimitSet	Hérité de: ACDCTerminal
0..1	Measurements	0..*	Measurement	Hérité de: ACDCTerminal
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.3.12 MktUserAttribute

Sous-classe de IEC61968:Domain2:UserAttribute

Le Tableau 86 présente tous les attributs de MktUserAttribute.

Tableau 86 – Attributs de MarketOpCommon::MktUserAttribute

nom	mult	type	description
sequenceNumber	0..1	Integer	Hérité de: UserAttribute
name	0..1	String	Hérité de: UserAttribute
value	0..1	StringQuantity	Hérité de: UserAttribute

Le Tableau 87 présente toutes les extrémités d'association de MktUserAttribute avec d'autres classes.

Tableau 87 – Extrémités d'association de MarketOpCommon::MktUserAttribute avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	ChargeType	0..*	ChargeType	
0..*	MarketStatementLineItem	0..*	MarketStatementLineItem	
0..*	PassThroughBill	0..*	PassThroughBill	
0..*	ChargeGroup	0..*	ChargeGroup	
1..1	AttributeProperty	0..*	AttributeProperty	
0..*	BillDeterminant	0..*	BillDeterminant	
0..*	Transaction	0..1	Transaction	Hérité de: UserAttribute

6.5.4 Paquetage MarketPlan

6.5.4.1 Généralités

Définitions du plan du marché pour les marchés planifiés, les événements de marché planifié, les processus de marché réels et les événements de marché réels.

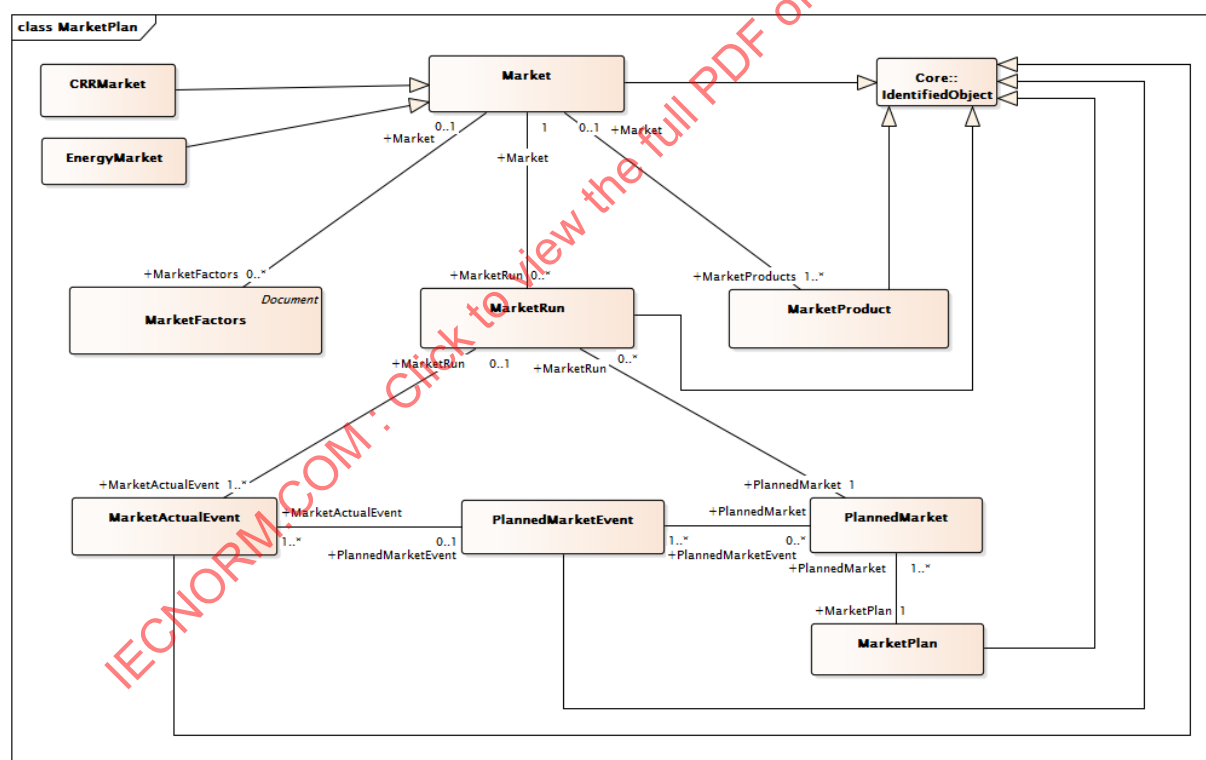


Figure 35 – Diagramme de classe MarketPlan::MarketPlan

Figure 35: représente les classes principales utilisées pour identifier une instance d'une solution d'équilibre du marché. La classe Market permet d'identifier si l'instance est un marché à J-1 (DAM), heure d'avant (intrajournalier) ou temps réel (RTM). La classe MarketFactors décrit un intervalle de marché comme la date/heure de début et de fin du marché. La classe MarketProduct indique le produit du marché, tel que le service énergétique ou auxiliaire. La classe PlannedMarket décrit les heures de début et de fin du marché. Les relations entre les classes sont également représentées.

6.5.4.2 CommodityDefinition

Dans le cadre de l'IEC 62325, les marchandises (Commodities) sont les produits du marché (MarketProducts) (énergie, régulation, réserve, etc.) échangés à un emplacement spécifique. Dans le cas présent, il s'agit d'un Pnode (un nœud de tarification spécifique ou une zone de tarification ou une zone définie comme étant une collection de nœuds de tarification). La CommodityDefinition contient deux paramètres, plus l'unité de mesure et la devise dans laquelle la marchandise est échangée. Il convient que chaque CommodityDefinition soit relativement statique, définie une seule fois et rarement modifiée.

Le Tableau 88 présente tous les attributs de CommodityDefinition.

Tableau 88 – Attributs de MarketPlan::CommodityDefinition

nom	mult	type	description
commodityCurrency	0..1	Currency	Devise dans laquelle la marchandise est échangée, conformément aux conventions normatives ainsi qu'à l'énumération Currency.
commodityUnit	0..1	UnitSymbol	Unité de mesure dans laquelle la marchandise est échangée, conformément aux conventions normatives ainsi qu'à l'énumération UnitSymbol.
commodityUnitMultiplier	0..1	UnitMultiplier	Multiplicateur de l'unité, par exemple "k" pour convertir l'unité "W-h" en "kW-h", conformément aux conventions normatives ainsi qu'à l'énumération UnitMultiplier.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 89 présente toutes les extrémités d'association de CommodityDefinition avec d'autres classes.

Tableau 89 – Extrémités d'association de MarketPlan::CommodityDefinition avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Pnode	1..1	Pnode	
0..*	MarketProduct	1..1	MarketProduct	
1..1	CommodityPrice	1..*	CommodityPrice	
0..*	RTO	1..1	RTO	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.4.3 CRRMarket

Modèle décrivant le marché de vente aux enchères des droits à revenu de congestion

Le Tableau 90 présente tous les attributs de CRRMarket.

Tableau 90 – Attributs de MarketPlan::CRRMarket

nom	mult	type	description
labelID	0..1	String	labelID – Identifiant pour un ensemble d'apnodes/pnodes utilisé dans un marché de CRR
actualEnd	0..1	DateTime	Hérité de: Market
actualStart	0..1	DateTime	Hérité de: Market
dst	0..1	Boolean	Hérité de: Market
end	0..1	DateTime	Hérité de: Market
localTimeZone	0..1	String	Hérité de: Market
start	0..1	DateTime	Hérité de: Market
status	0..1	String	Hérité de: Market
timeIntervalLength	0..1	Float	Hérité de: Market
tradingDay	0..1	DateTime	Hérité de: Market
tradingPeriod	0..1	String	Hérité de: Market
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 91 présente toutes les extrémités d'association de CRRMarket avec d'autres classes.

Tableau 91 – Extrémités d'association de MarketPlan::CRRMarket avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	CongestionRevenueRight	1..*	CongestionRevenueRight	
0..1	MarketFactors	0..*	MarketFactors	Hérité de: Market
0..1	MarketProducts	1..*	MarketProduct	Hérité de: Market
1..1	MarketRun	0..*	MarketRun	Hérité de: Market
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.4.4 DistributedResourceActualEvent

Un événement de réponse à une demande est créé en cas de besoin de ressources répondant à des requêtes d'ajustement de la demande. Ces événements sont créés par les opérations du système ISO/RTO et gérés par un système de gestion des réponses à la demande (DRMS – demand response management system). Ces événements peuvent être ou ne pas être coordonnés avec les événements du marché (Market Events) et un marché d'énergie (Energy Market) défini. L'événement sollicite le déploiement d'un certain nombre de ressources enregistrées, ou le déploiement de ressources au sein d'une zone (une zone organisationnelle dans le système d'alimentation qui contient un certain nombre de ressources).

Le Tableau 92 présente tous les attributs de DistributedResourceActualEvent.

Tableau 92 – Attributs de MarketPlan::DistributedResourceActualEvent

nom	mult	type	description
totalPowerAdjustment	0..1	ActivePower	Ajustement complet de la puissance active (par exemple, réduction de charge) demandé pour cet événement de réponse à la demande.
eventComments	1..1	String	Hérité de: MarketActualEvent
eventEndTime	0..1	DateTime	Hérité de: MarketActualEvent
eventStartTime	0..1	DateTime	Hérité de: MarketActualEvent
eventStatus	1..1	MarketEventStatusKind	Hérité de: MarketActualEvent
eventType	1..1	String	Hérité de: MarketActualEvent
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 93 présente toutes les extrémités d'association de DistributedResourceActualEvent avec d'autres classes.

Tableau 93 – Extrémités d'association de MarketPlan::DistributedResourceActualEvent avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	InstructionClearing	0..*	InstructionClearing	ActualDemandResponseEvents pouvant exister sans faire partie d'un MarketActualEvent coordonné associé à un marché. Ces ActualDemandResponseEvents peuvent avoir plusieurs instructions InstructionClearing pour les RegisteredResources ou AggregateNodes DemandResponse spécifiés.
1..1	ResourcePerformanceEvaluations	0..*	ResourcePerformanceEvaluation	
0..1	InstructionClearingDOT	0..*	InstructionClearingDOT	
1..*	MarketRun	0..1	MarketRun	Hérité de: MarketActualEvent
1..*	PlannedMarketEvent	0..1	PlannedMarketEvent	Hérité de: MarketActualEvent
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.4.5 EnergyMarket

Marché énergétique et auxiliaire (par exemple, énergie, réserve tournante, réserve non tournante) avec une description des paramètres de réglage des opérations du marché.

Le Tableau 94 présente tous les attributs de EnergyMarket.

Tableau 94 – Attributs de MarketPlan::EnergyMarket

nom	mult	type	description
actualEnd	0..1	DateTime	Hérité de: Market
actualStart	0..1	DateTime	Hérité de: Market
dst	0..1	Boolean	Hérité de: Market
end	0..1	DateTime	Hérité de: Market
localTimeZone	0..1	String	Hérité de: Market
start	0..1	DateTime	Hérité de: Market
status	0..1	String	Hérité de: Market
timeIntervalLength	0..1	Float	Hérité de: Market
tradingDay	0..1	DateTime	Hérité de: Market
tradingPeriod	0..1	String	Hérité de: Market
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 95 présente toutes les extrémités d'association de EnergyMarket avec d'autres classes.

Tableau 95 – Extrémités d'association de MarketPlan::EnergyMarket avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResources	0..*	RegisteredResource	
0..*	RTO	0..1	RTO	
0..1	Settlements	0..*	Settlement	
1..1	MarketResults	0..1	MarketResults	
1..1	Bids	0..*	Bid	
0..1	MarketFactors	0..*	MarketFactors	Hérité de: Market
0..1	MarketProducts	1..*	MarketProduct	Hérité de: Market
1..1	MarketRun	0..*	MarketRun	Hérité de: Market
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.4.6 Market

Marché (à J-1 ou à temps réel, par exemple) avec une description des paramètres de réglage des opérations du marché.

Le Tableau 96 présente tous les attributs de Market.

Tableau 96 – Attributs de MarketPlan::Market

nom	mult	type	description
actualEnd	0..1	DateTime	Heure de fin du marché – fin réelle du marché
actualStart	0..1	DateTime	Heure de début du marché – début réel du marché
dst	0..1	Boolean	True si l'heure d'été (DST – Daylight Saving Time) est appliquée.
end	0..1	DateTime	Heure de fin du marché.
localTimeZone	0..1	String	Fuseau horaire local.
start	0..1	DateTime	Heure de début du marché.
status	0..1	String	Statut du marché "OPEN" (OUVERT), "CLOSED" (FERMÉ), "CLEARED" (ÉQUILIBRÉ), "BLOCKED" (BLOQUÉ)
timeIntervalLength	0..1	Float	Longueur de l'intervalle de temps entre les transactions.
tradingDay	0..1	DateTime	Date de transaction sur le marché
tradingPeriod	0..1	String	Période d'échange décrivant le marché. Pour un marché de l'énergie: Jour Heure Pour un marché de CRR: Année Mois Saison
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 97 présente toutes les extrémités d'association de Market avec d'autres classes.

Tableau 97 – Extrémités d'association de MarketPlan::Market avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	MarketFactors	0..*	MarketFactors	
0..1	MarketProducts	1..*	MarketProduct	
1..1	MarketRun	0..*	MarketRun	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.4.7 MarketActualEvent

Cette classe représente l'instance réelle d'un événement.

Le Tableau 98 présente tous les attributs de MarketActualEvent.

Tableau 98 – Attributs de MarketPlan::MarketActualEvent

nom	mult	type	description
eventComments	1..1	String	Commentaires à structure non imposée concernant l'événement, pour tout besoin quelconque.
eventEndTime	0..1	DateTime	Heure de fin de l'événement.
eventStartTime	0..1	DateTime	Heure de début de l'événement.
eventStatus	1..1	MarketEventStatusKind	Statut de l'événement, par exemple, actif, annulé, expiré, etc.
eventType	1..1	String	Type réel d'événement.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 99 présente toutes les extrémités d'association de MarketActualEvent avec d'autres classes.

Tableau 99 – Extrémités d'association de MarketPlan::MarketActualEvent avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	MarketRun	0..1	MarketRun	Processus de marché déclenché par cet événement réel. Par exemple, le processus de marché DA est déclenché par l'événement de l'ouverture d'un appel d'offres réel et se termine par l'exécution et la fin réelles du processus de marché DA saisi par le runState du RunMarket
1..*	PlannedMarketEvent	0..1	PlannedMarketEvent	Événement planifié exécuté par cet événement réel.
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.4.8 MarketFactors

Agrégation des informations du marché relatives à un intervalle de temps spécifique.

Le Tableau 100 présente tous les attributs de MarketFactors.

Tableau 100 – Attributs de MarketPlan::MarketFactors

nom	mult	type	description
intervalEndTime	0..1	DateTime	Fin de l'intervalle de temps pour lequel une exigence est définie.
intervalStartTime	0..1	DateTime	Début de l'intervalle de temps pour lequel une exigence est définie.
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 101 présente toutes les extrémités d'association de MarketFactors avec d'autres classes.

Tableau 101 – Extrémités d'association de MarketPlan::MarketFactors avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktActivityRecord	0..*	MktActivityRecord	
0..*	Market	0..1	Market	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.4.9 MarketPlan

Cette classe identifie un ensemble de marchés planifiés.

Le Tableau 102 présente tous les attributs de MarketPlan.

Tableau 102 – Attributs de MarketPlan::MarketPlan

nom	mult	type	description
tradingDay	0..1	DateTime	Jour d'échange du marché planifié.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 103 présente toutes les extrémités d'association de MarketPlan avec d'autres classes.

Tableau 103 – Extrémités d'association de MarketPlan::MarketPlan avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	PlannedMarket	1..*	PlannedMarket	Un plan de marché comprend plusieurs marchés (DA, HA, RT).
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.4.10 MarketProduct

Produit commercialisé par un RTO (par exemple, énergie, réserve tournante de 10 min). La régulation à la hausse, la régulation à la baisse, la réserve tournante, la réserve non tournante, etc., sont des exemples de produits de services auxiliaires.

Le Tableau 104 présente tous les attributs de MarketProduct.

Tableau 104 – Attributs de MarketPlan::MarketProduct

nom	mult	type	description
marketProductType	0..1	MarketProductType	Exemples de type de produit du marché: EN (Energy, Énergie) RU (Regulation Up – Régulation à la hausse) RD (Regulation Dn – Régulation à la baisse) SR (Spinning Reserve – Réserve tournante) NR (Non-Spinning Reserve – Réserve non tournante) RC (RUC, Residual Unit Commitment – Gestion de la production résiduelle)
rampInterval	0..1	Float	Intervalle de temps de rampe pour le type de produit du marché spécifié par l'attribut marketProductType. Par exemple, si marketProductType = EN (énumération MarketProductType), alors rampInterval est l'intervalle de temps de rampe de Energy.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 105 présente toutes les extrémités d'association de MarketProduct avec d'autres classes.

Tableau 105 – Extrémités d'association de MarketPlan::MarketProduct avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	Market	0..1	Market	
1..1	ProductBids	0..*	ProductBid	
1..1	ResourceAwardInstruction	0..*	ResourceAwardInstruction	
0..1	BidError	0..*	BidError	
0..1	BidPriceCap	0..*	BidPriceCap	
0..1	MarketRegionResults	0..1	MarketRegionResults	
1..1	CommodityDefinition	0..*	CommodityDefinition	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.4.11 MarketRun

Cette classe représente une instance réelle d'un marché planifié. Par exemple, un marché à J-1 s'ouvre avec l'ouverture d'un appel d'offres (Bid Submission) et se termine par la clôture de cet appel d'offres. Le processus de marché représente l'ensemble du processus. MarketRuns peut être défini pour les marchés tels que Day Ahead Market (marché à J-1), Real Time Market (marché en temps réel), Hour Ahead Market (marché à H-1) et Week Ahead Market (marché de la semaine d'avant).

Le Tableau 106 présente tous les attributs de MarketRun.

Tableau 106 – Attributs de MarketPlan::MarketRun

nom	mult	type	description
executionType	0..1	ExecutionType	Type d'exécution: J-1, intrajournalier, prépartition en temps réel, répartition en temps réel
marketApprovalTime	0..1	DateTime	Heure approuvée de la répartition. Identifie l'heure à laquelle le répartiteur approuve un cas de répartition d'unités en temps réel spécifique.
marketApprovedStatus	0..1	Boolean	Défini sur True lorsque le plan est approuvé par une autorité. Celui-ci devient le plan officiel du marché à J-1. Identifie le cas approuvé du marché pour l'intervalle de temps spécifié.
marketEndTime	0..1	DateTime	Heure de fin définie comme la fin du marché: heure de fin du marché.
marketStartTime	0..1	DateTime	Heure de début définie comme le début du marché: heure de début du marché.
marketType	0..1	MarketType	Type de marché: marché à J-1 ou marché en temps réel.
reportedState	0..1	String	État des activités de processus de marché telles que rapportées par les systèmes de marché aux services de définition du marché.

nom	mult	type	description
runState	0..1	String	État contrôlé par le service de définition du marché. Exemples de valeurs possibles: Open (Ouvert), Close (Fermé).
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 107 présente toutes les extrémités d'association de MarketRun avec d'autres classes.

Tableau 107 – Extrémités d'association de MarketPlan::MarketRun avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Market	1..1	Market	
0..1	MarketActualEvent	1..*	MarketActualEvent	Tous les événements réels qui déclenchent ce processus de marché.
0..*	PlannedMarket	1..1	PlannedMarket	Un marché planifié peut avoir plusieurs processus de marché, car il peut présenter un nouveau processus.
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.4.12 Classe racine PlannedMarket

Modélise un marché planifié. Par exemple, un marché DA/HA/RT planifié.

Le Tableau 108 présente tous les attributs de PlannedMarket.

Tableau 108 – Attributs de MarketPlan::PlannedMarket

nom	mult	type	description
marketEndTime	0..1	DateTime	Heure de fin du marché.
marketStartTime	0..1	DateTime	Heure de début du marché.
marketType	0..1	MarketType	Type de marché.

Le Tableau 109 présente toutes les extrémités d'association de PlannedMarket avec d'autres classes.

Tableau 109 – Extrémités d'association de MarketPlan::PlannedMarket avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	MarketRun	0..*	MarketRun	Un marché planifié peut avoir plusieurs processus de marché, car il peut présenter un nouveau processus.
0..*	PlannedMarketEvent	1..*	PlannedMarketEvent	Un marché planifié doit avoir un ensemble d'événements planifiés.
1..*	MarketPlan	1..1	MarketPlan	Un plan de marché comprend plusieurs marchés (DA, HA, RT).

6.5.4.13 PlannedMarketEvent

Cette classe représente des événements planifiés. Elle est utilisée pour modéliser les différents événements planifiés dans un marché (heure de fermeture, temps de mise en équilibre, etc.).

Le Tableau 110 présente tous les attributs de PlannedMarketEvent.

Tableau 110 – Attributs de MarketPlan::PlannedMarketEvent

nom	mult	type	description
eventType	0..1	String	Type d'événement planifié.
plannedTime	0..1	Integer	Il s'agit d'un temps relatif pour que cet attribut puisse être utilisé par plusieurs marchés planifiés. Par exemple, les appels d'offres s'effectuent tous les jours à 10h.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 111 présente toutes les extrémités d'association de PlannedMarketEvent avec d'autres classes.

Tableau 111 – Extrémités d'association de MarketPlan::PlannedMarketEvent avec d'autres classes

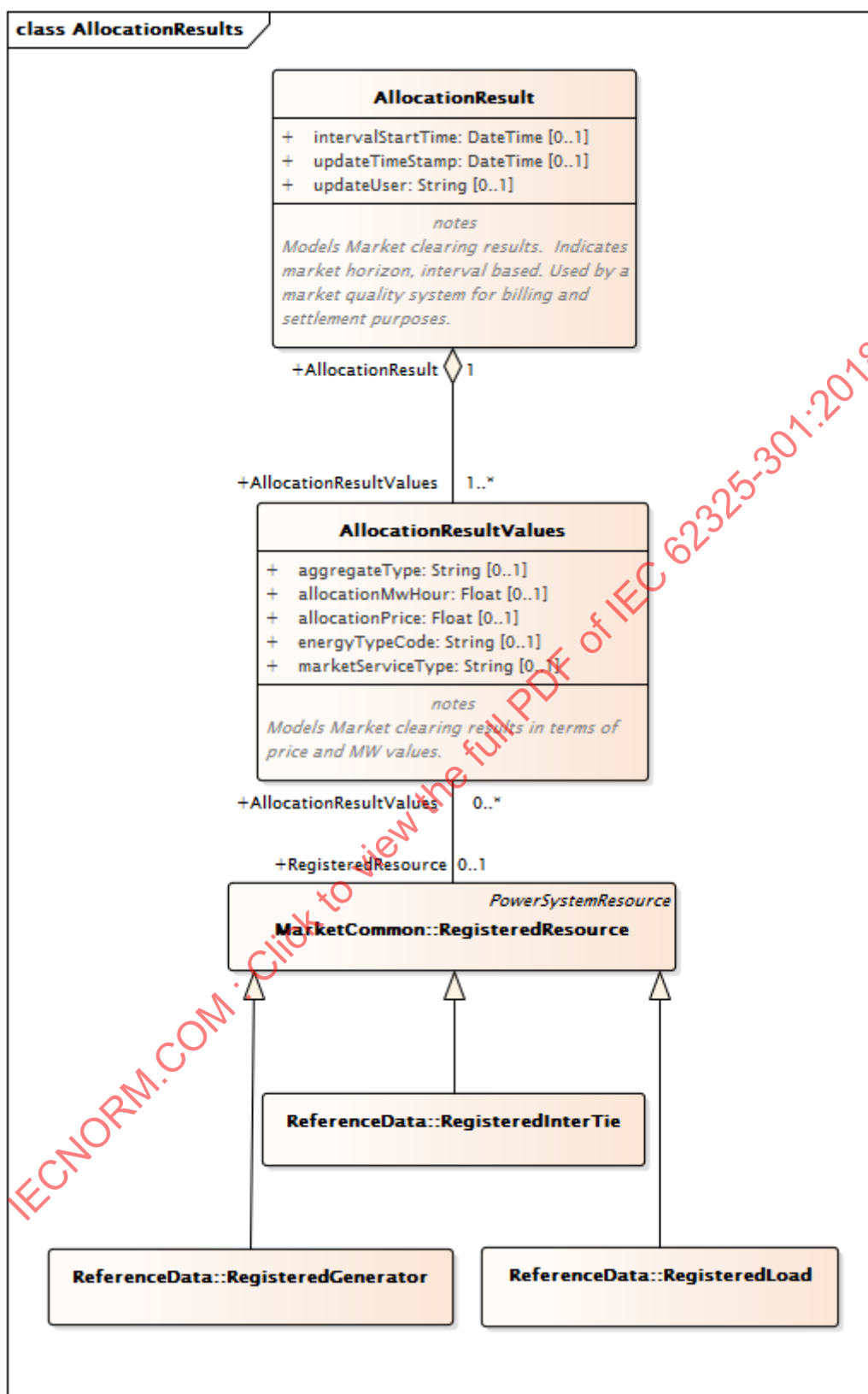
mult à partir de	nom	mult vers	type	description
0..1	MarketActualEvent	1..*	MarketActualEvent	Tous les événements réels qui exécutent cet événement planifié.
1..*	PlannedMarket	0..*	PlannedMarket	Un marché planifié doit avoir un ensemble d'événements planifiés.
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.5 Paquetage MarketQualitySystem

6.5.5.1 Généralités

Comptabilité, calcul et corrections des données de compteur post-commercialisation pour réduire les erreurs et les litiges relatifs à la facturation. Réduit la validation, la vérification et la correction manuelles des données de transaction qui pourraient influencer sur les règlements du marché. Nouvelle publication des résultats du marché après correction des données concernées.

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Anglais	Français
Class AllocationResults	Classe AllocationResults
notes Models Market clearing results. Indicates market horizon, interval based. Used by a market quality system for billing and settlement purposes	notes Modélise les résultats d'équilibre du marché. Indique l'horizon du marché sur la base d'intervalles. Utilisée par un système de qualité du marché à des fins de facturation et de règlement
notes Models Market clearing results in terms of price and MW values	notes Modélise les résultats d'équilibre du marché en termes de prix et de MW

Figure 36 – Diagramme de classe MarketQualitySystem::AllocationResults

Figure 36: représente les principales classes associées au système de qualité du marché (MQS – Market Quality System) qui est généralement utilisé pour effectuer des analyses avant la facturation et le règlement. Elle décrit les résultats envoyés au MQS. Les principales classes incluent AllocationResult, qui définit l'horizon du marché. Les résultats attribués sont décrits dans les classes AllocationResultsValues et RegisteredResource, ainsi que dans les sous-classes pour les générateurs, les interconnexions et les charges.

6.5.5.2 Classe racine AllocationResult

Modélise les résultats d'équilibre du marché. Indique l'horizon du marché sur la base d'intervalles. Utilisée par un système de qualité du marché à des fins de facturation et de règlement.

Le Tableau 112 présente tous les attributs de AllocationResult.

Tableau 112 – Attributs de MarketQualitySystem::AllocationResult

nom	mult	type	description
intervalStartTime	0..1	DateTime	
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	

Le Tableau 113 présente toutes les extrémités d'association de AllocationResult avec d'autres classes.

Tableau 113 – Extrémités d'association de MarketQualitySystem::AllocationResult avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	AllocationResultsValues	1..*	AllocationResultsValues	

6.5.5.3 Classe racine AllocationResultsValues

Modélise les résultats d'équilibre du marché en termes de prix et de MW.

Le Tableau 114 présente tous les attributs de AllocationResultsValues.

Tableau 114 – Attributs de MarketQualitySystem::AllocationResultValues

nom	mult	type	description
aggregateType	0..1	String	"1" – "Detail", "2" – "Aggregate by Market service type", auquel cas le champ "AllocationEnergyType" ne sera pas renseigné; "3" – "Aggregate by "AllocationEnergyType", auquel cas "MarketServiceType" ne sera pas renseigné.
allocationMwHour	0..1	Float	
allocationPrice	0..1	Float	
energyTypeCode	0..1	String	
marketServiceType	0..1	String	Les différentes possibilités sont: ME – Market Energy (capacité d'énergie du marché); SR – Spinning Reserve (capacité de réserve tournante); NR – Non-Spinning Reserve (capacité de réserve non tournante); DAC – Day Ahead Capacity (capacité à J-1); DEC – Derate Capacity (capacité de réduction).

Le Tableau 115 présente toutes les extrémités d'association de AllocationResultValues avec d'autres classes.

Tableau 115 – Extrémités d'association de MarketQualitySystem::AllocationResultValues avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	AllocationResult	1..1	AllocationResult	

6.5.5.4 Classe racine AuxiliaryCost

Modélise les résultats d'équilibre du marché pour les coûts auxiliaires.

Le Tableau 116 présente tous les attributs de AuxiliaryCost.

Tableau 116 – Attributs de MarketQualitySystem::AuxiliaryCost

nom	mult	type	description
intervalStartTime	0..1	DateTime	
marketType	0..1	MarketType	
updateTimeStamp	0..1	DateTime	
updateUser	0..1	String	

Le Tableau 117 présente toutes les extrémités d'association de AuxiliaryCost avec d'autres classes.

Tableau 117 – Extrémités d'association de MarketQualitySystem::AuxiliaryCost avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	AuxiliaryValues	1..*	AuxiliaryValues	

6.5.5.5 Classe racine AuxiliaryObject

Modélise les valeurs auxiliaires.

Le Tableau 118 présente toutes les extrémités d'association de AuxiliaryObject avec d'autres classes.

Tableau 118 – Extrémités d'association de MarketQualitySystem::AuxiliaryObject avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredLoad	0..1	RegisteredLoad	
0..*	RegisteredGenerator	0..1	RegisteredGenerator	

6.5.5.6 AuxiliaryValues

Modélise les valeurs auxiliaires.

Le Tableau 119 présente tous les attributs de AuxiliaryValues.

Tableau 119 – Attributs de MarketQualitySystem::AuxiliaryValues

nom	mult	type	description
minExpostCapacity	0..1	Float	
maxExpostCapacity	0..1	Float	
availUndispatchedQ	0..1	Float	
incrementalORAvail	0..1	Float	
startUpCost	0..1	Float	
startUpCostEligibilityFlag	0..1	YesNo	
noLoadCost	0..1	Float	
noLoadCostEligibilityFlag	0..1	YesNo	

Le Tableau 120 présente toutes les extrémités d'association de AuxiliaryValues avec d'autres classes.

Tableau 120 – Extrémités d'association de MarketQualitySystem::AuxiliaryValues avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	AuxiliaryCost	1..1	AuxiliaryCost	
1..*	TenMinAuxiliaryData	1..1	TenMinAuxiliaryData	
1..*	FiveMinAuxiliaryData	1..1	FiveMinAuxiliaryData	
0..*	RegisteredLoad	0..1	RegisteredLoad	Hérité de: AuxiliaryObject
0..*	RegisteredGenerator	0..1	RegisteredGenerator	Hérité de: AuxiliaryObject

6.5.5.7 Classe racine ExpectedEnergy

Modélise l'énergie prévue à partir de l'équilibre du marché sur la base d'intervalles.

Le Tableau 121 présente tous les attributs de ExpectedEnergy.

Tableau 121 – Attributs de MarketQualitySystem::ExpectedEnergy

nom	mult	type	description
intervalStartTime	0..1	DateTime	
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	

Le Tableau 122 présente toutes les extrémités d'association de ExpectedEnergy avec d'autres classes.

Tableau 122 – Extrémités d'association de MarketQualitySystem::ExpectedEnergy avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	ExpectedEnergyValues	1..*	ExpectedEnergyValues	

6.5.5.8 Classe racine ExpectedEnergyValues

Modélise l'énergie prévue à partir de l'équilibre du marché.

Le Tableau 123 présente tous les attributs de ExpectedEnergyValues.

Tableau 123 – Attributs de MarketQualitySystem::ExpectedEnergyValues

nom	mult	type	description
energyTypeCode	0..1	String	
expectedMwh	0..1	Float	

Le Tableau 124 présente toutes les extrémités d'association de ExpectedEnergyValues avec d'autres classes.

**Tableau 124 – Extrémités d'association de
MarketQualitySystem::ExpectedEnergyValues avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	ExpectedEnergy	1..1	ExpectedEnergy	

6.5.5.9 Classe racine FiveMinAuxiliaryData

Modélise des données auxiliaires de 5 min.

Le Tableau 125 présente tous les attributs de FiveMinAuxiliaryData.

Tableau 125 – Attributs de MarketQualitySystem::FiveMinAuxiliaryData

nom	mult	type	description
intervalStartTime	0..1	DateTime	
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	

Le Tableau 126 présente toutes les extrémités d'association de FiveMinAuxiliaryData avec d'autres classes.

**Tableau 126 – Extrémités d'association de MarketQualitySystem::
FiveMinAuxiliaryData avec d'autres classes**

mult à partir de	nom	mult vers	type	description
1..1	AuxiliaryValues	1..*	AuxiliaryValues	

6.5.5.10 Classe racine TenMinAuxiliaryData

Modélise des données auxiliaires de 10 min.

Le Tableau 127 présente tous les attributs de TenMinAuxiliaryData.

Tableau 127 – Attributs de MarketQualitySystem::TenMinAuxiliaryData

nom	mult	type	description
intervalStartTime	0..1	DateTime	
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	

Le Tableau 128 présente toutes les extrémités d'association de TenMinAuxiliaryData avec d'autres classes.

Tableau 128 – Extrémités d'association de MarketQualitySystem::TenMinAuxiliaryData avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	AuxillaryData	1..*	AuxiliaryValues	

6.5.5.11 Classe racine TradingHubPrice

Modélise les prix sur les plates-formes de négociation sur la base d'intervalles.

Le Tableau 129 présente tous les attributs de TradingHubPrice.

Tableau 129 – Attributs de MarketQualitySystem::TradingHubPrice

nom	mult	type	description
intervalStartTime	0..1	DateTime	
marketType	0..1	MarketType	
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	

Le Tableau 130 présente toutes les extrémités d'association de TradingHubPrice avec d'autres classes.

Tableau 130 – Extrémités d'association de MarketQualitySystem::TradingHubPrice avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	TradingHubValues	1..*	TradingHubValues	

6.5.5.12 Classe racine TradingHubValues

Modélise les prix sur les plates-formes de négociation.

Le Tableau 131 présente tous les attributs de TradingHubValues.

Tableau 131 – Attributs de MarketQualitySystem::TradingHubValues

nom	mult	type	description
price	0..1	Float	Utilise le type de marché. Pour DA, le prix est calculé sur une base horaire. Pour RTM, le prix est défini pour 5 min.

Le Tableau 132 présente toutes les extrémités d'association de TradingHubValues avec d'autres classes.

Tableau 132 – Extrémités d'association de MarketQualitySystem::TradingHubValues avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	AggregatedPnode	1..1	AggregatedPnode	
1..*	TradingHubPrice	1..1	TradingHubPrice	

6.5.6 Paquetage MarketSystem

6.5.6.1 Généralités

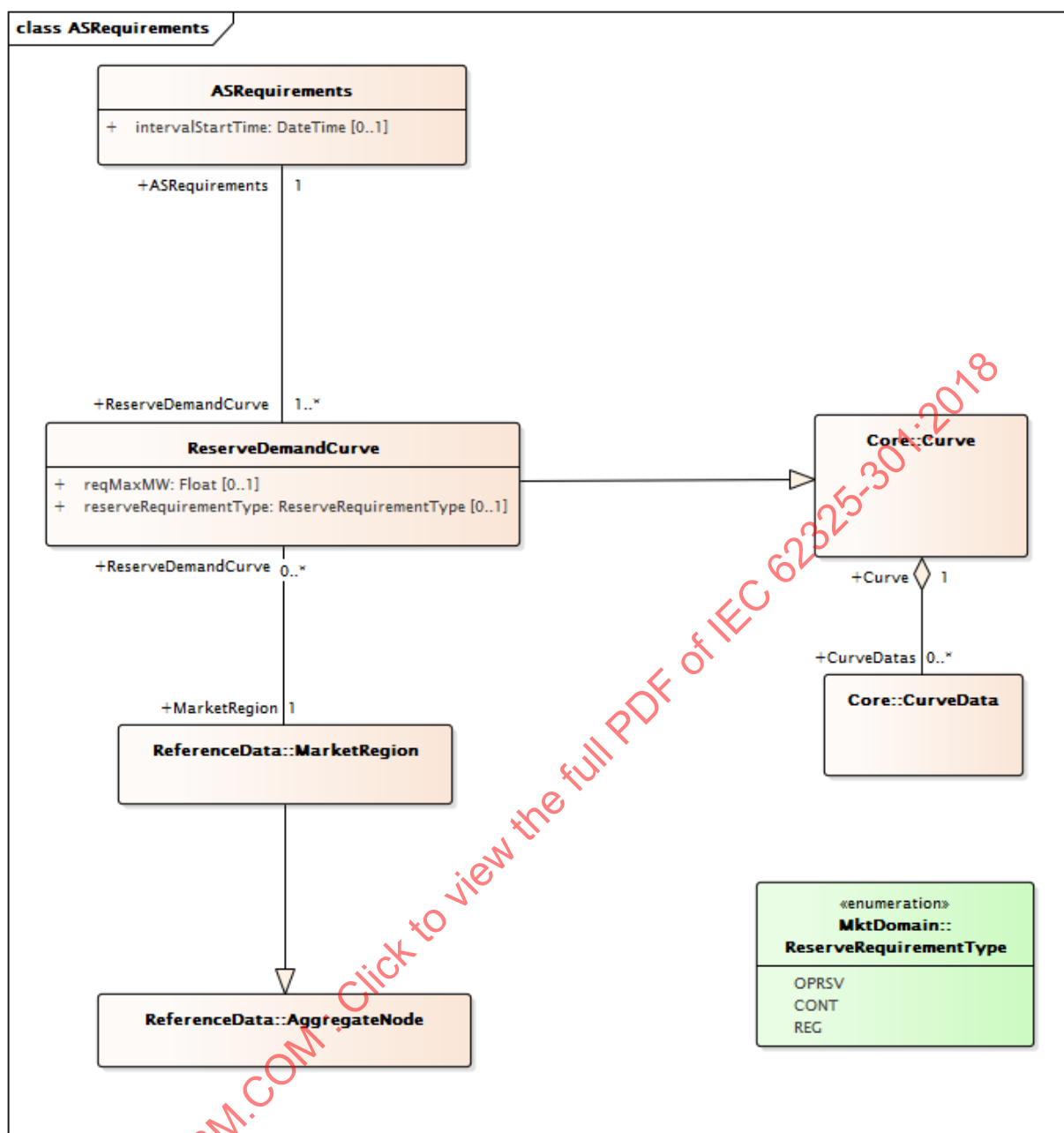
Résultats du marché et entrées externes consommées par les marchés.

6.5.6.2 Paquetage ExternalInputs

6.5.6.2.1 Généralités

Entrées du système de marché depuis les sources externes.

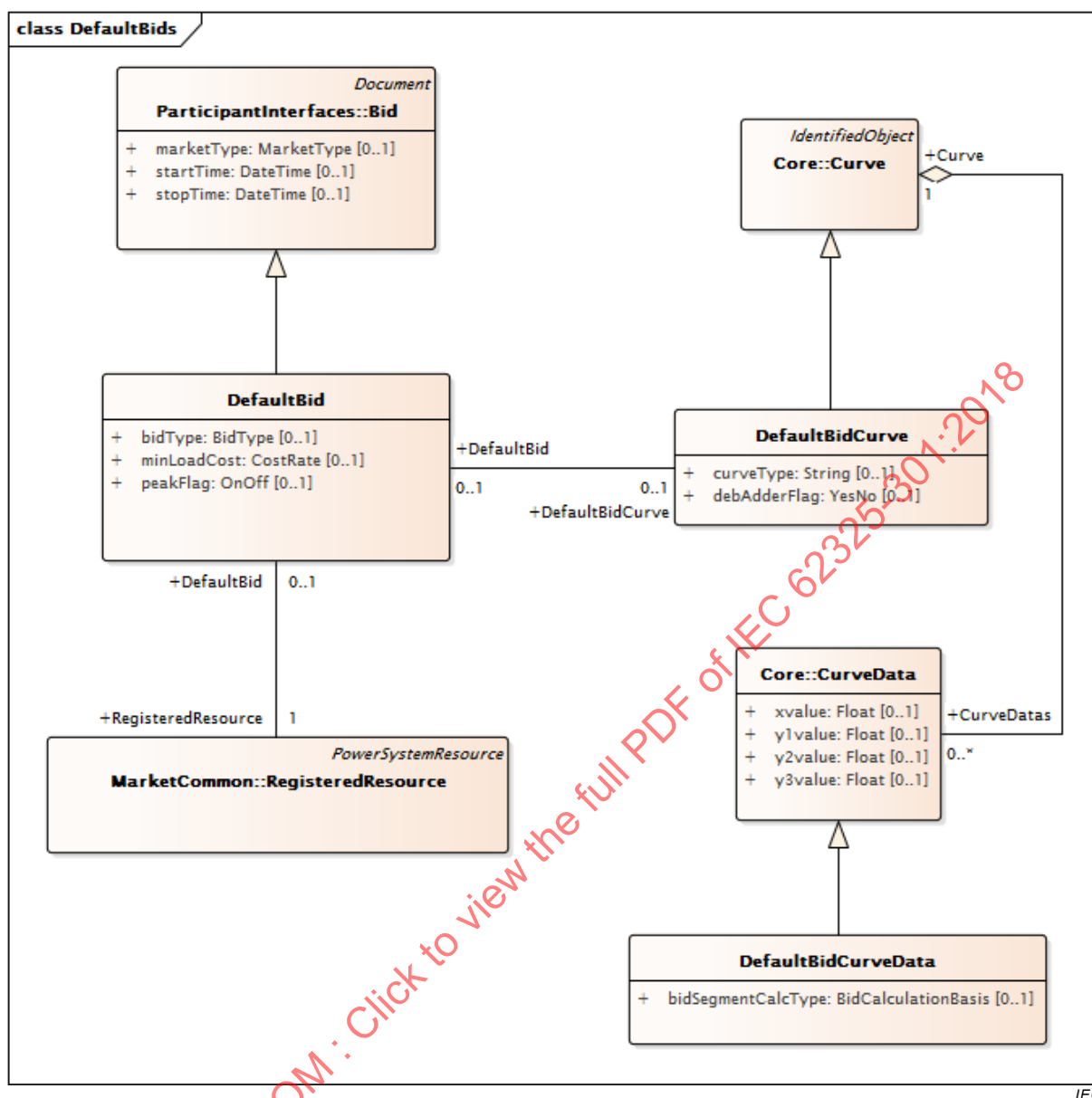
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Figure 37 – Diagramme de classe ExternalInputs::ASRequirements

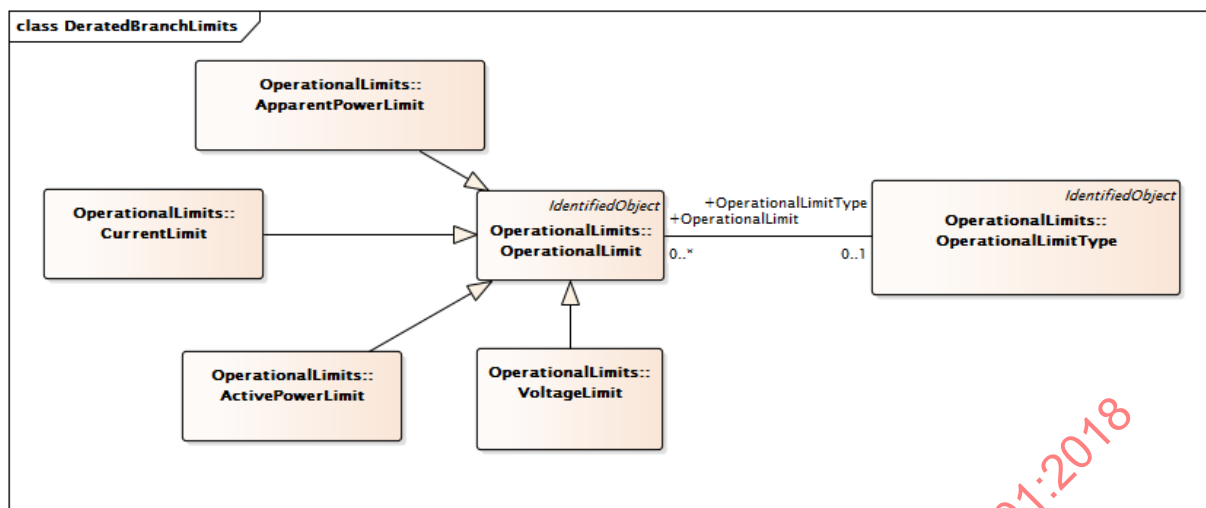
Figure 37: modélise les exigences des services auxiliaires. La classe **ASRequirements** est utilisée pour décrire l'intervalle pour lequel l'AncillaryService (service auxiliaire) est exigé et pour indiquer les quantités de services auxiliaires exigées. L'association à **MarketRegion** modélise les exigences régionales des services auxiliaires. La classe **MarketProduct** est utilisée pour décrire la classe particulière de services auxiliaires.



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Figure 38 – Diagramme de classe ExternalInputs::DefaultBids

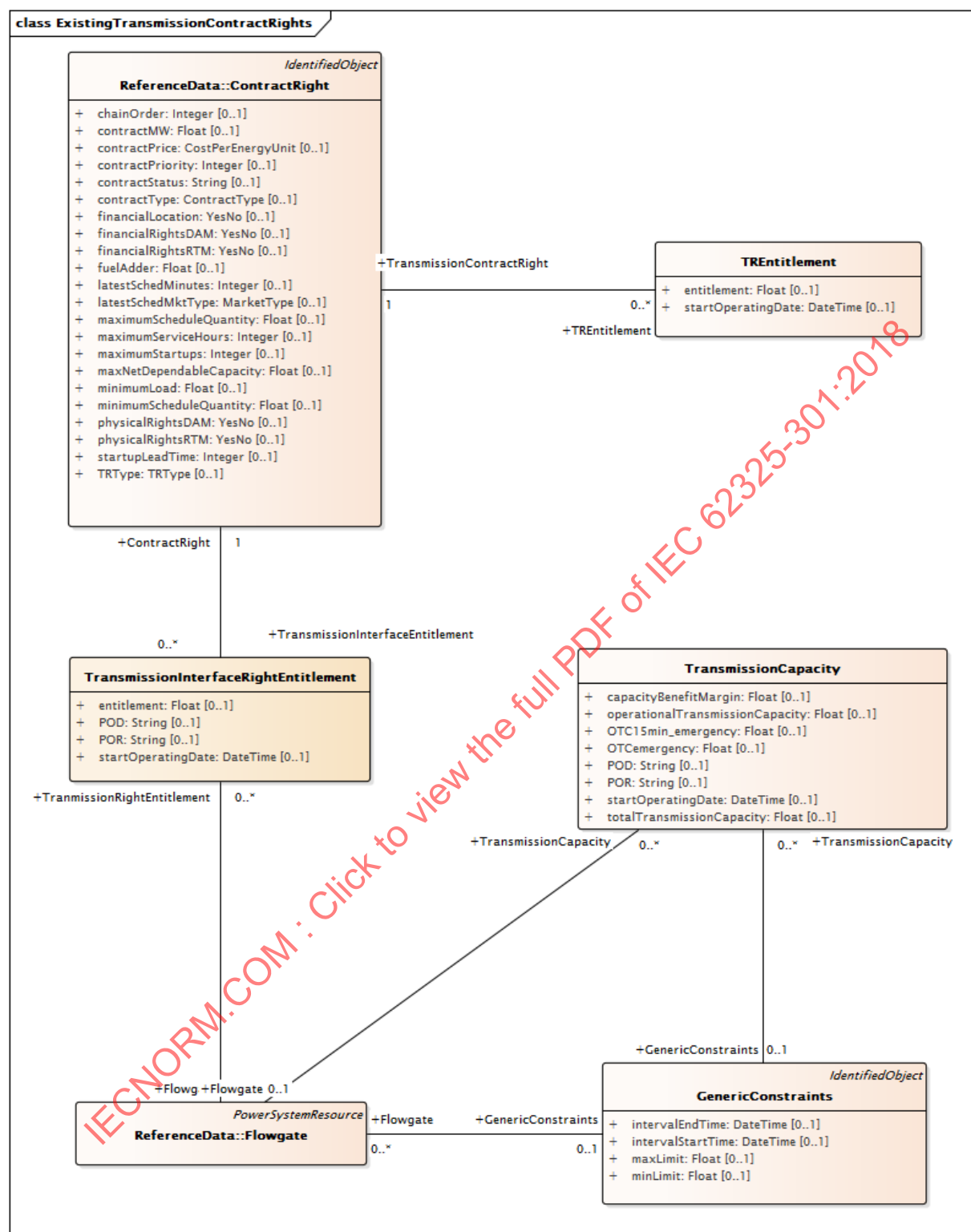
Figure 38: représente les classes utilisées pour modéliser une offre par défaut. L'atténuation de l'emprise sur le marché (Market Power Mitigation) est un processus qui permet de détecter la tentative d'un participant d'exercer un pouvoir de marché. La détection est suivie de mesures correctives. Il s'agit par exemple de remplacer l'offre d'origine par une offre par défaut. Les classes comprennent Curve et Curve Data (du paquetage principal IEC 61970), ainsi que la classe générique DefaultBid qui peut être utilisée pour décrire davantage les méthodes de mesures correctives spécifiques du marché. Trois méthodes types sont utilisées: LMP, coût basé sur l'indice du gaz ou négociation hors marché.



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Figure 39 – Diagramme de classe ExternalInputs::DeratedBranchLimits

Figure 39: représente les principales classes utilisées pour modéliser les limites opérationnelles. Les classes sont réutilisées à partir du paquetage IEC 61970 OperationalLimits et comprennent la ActivePower (puissance active), la Voltage (tension) et les CurrentLimits (limites de courant).



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Figure 40 – Diagramme de classe ExternalInputs::ExistingTransmissionContractRights

Figure 40: représente les principales classes utilisées pour modéliser ces droits existants. Lors du démarrage et de l'évolution des marchés LMP, il s'est avéré nécessaire de prendre en compte les droits de transport existants dans la solution du marché. La classe ContractRight inclut des informations sur les droits spécifiques qui sont contractés en termes de puissance active et d'autres informations contractuelles. La classe TransmissionInterfaceRightEntitlement décrit les aspects physiques du droit dans les points de livraison et de réception associés de la puissance active.

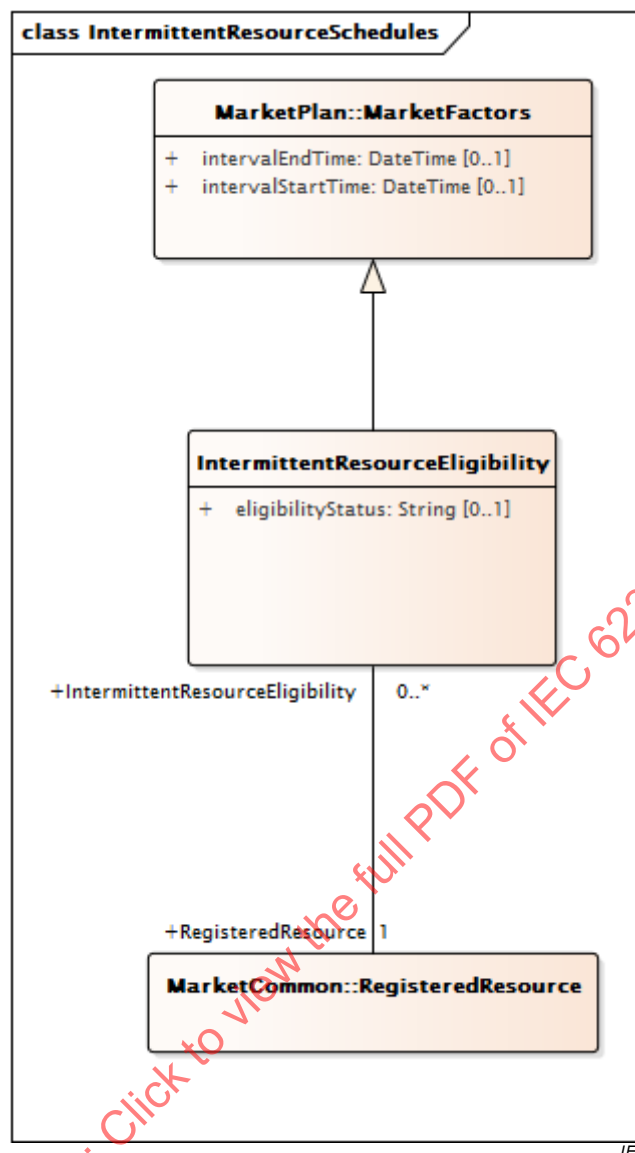


Figure 41 – Diagramme de classe ExternalInputs::IntermittentResourceSchedules

Figure 41: représente les classes principales utilisées pour modéliser les ressources (variables) intermittentes. Elle est habituellement utilisée pour modéliser les énergies renouvelables, telles que l'énergie éolienne. La classe **IntermittentResourceEligibility** permet d'indiquer si les ressources sont en mesure de participer en tant que ressources renouvelables régies par un régime générique de ressources renouvelables.

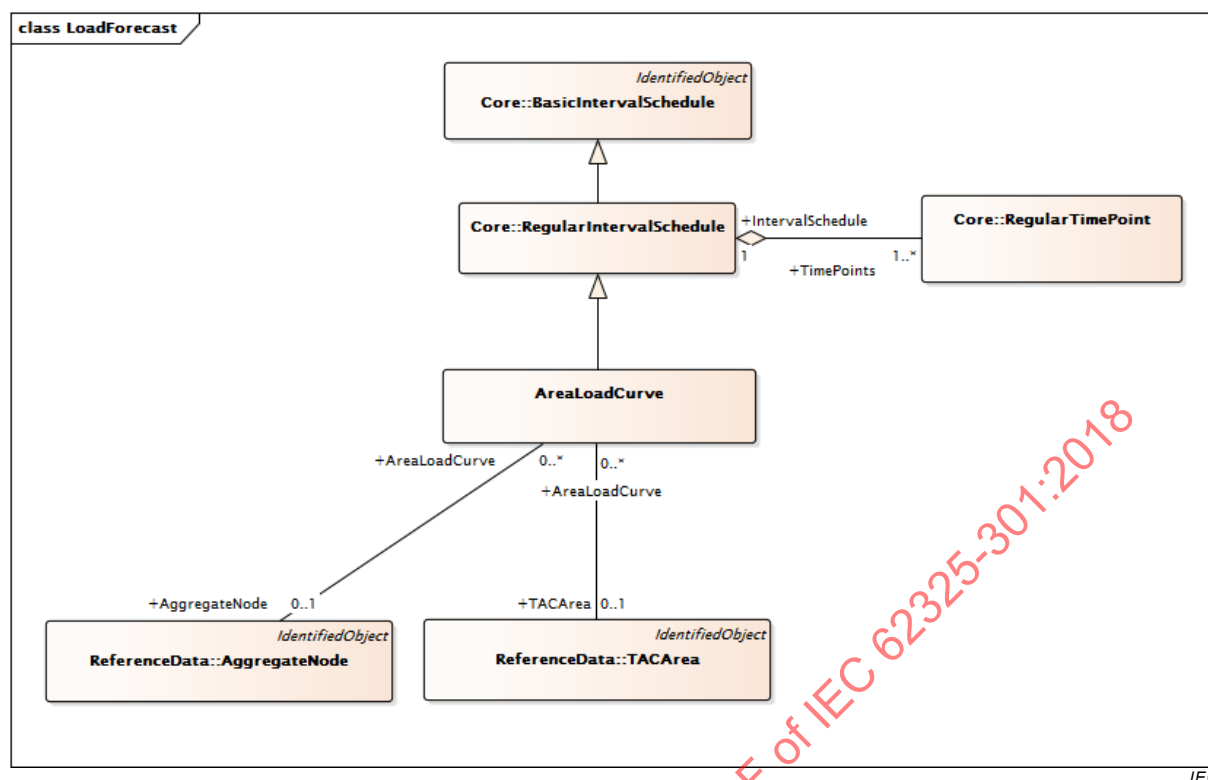


Figure 42 – Diagramme de classe ExternalInputs::LoadForecast

Figure 42: représente les classes utilisées pour modéliser la prévision de charge dans l'horizon temporel du marché. Le modèle réutilisé procède au classement dans le paquetage Core IEC 61970 et ajoute des modèles spécifiques aux marchés.

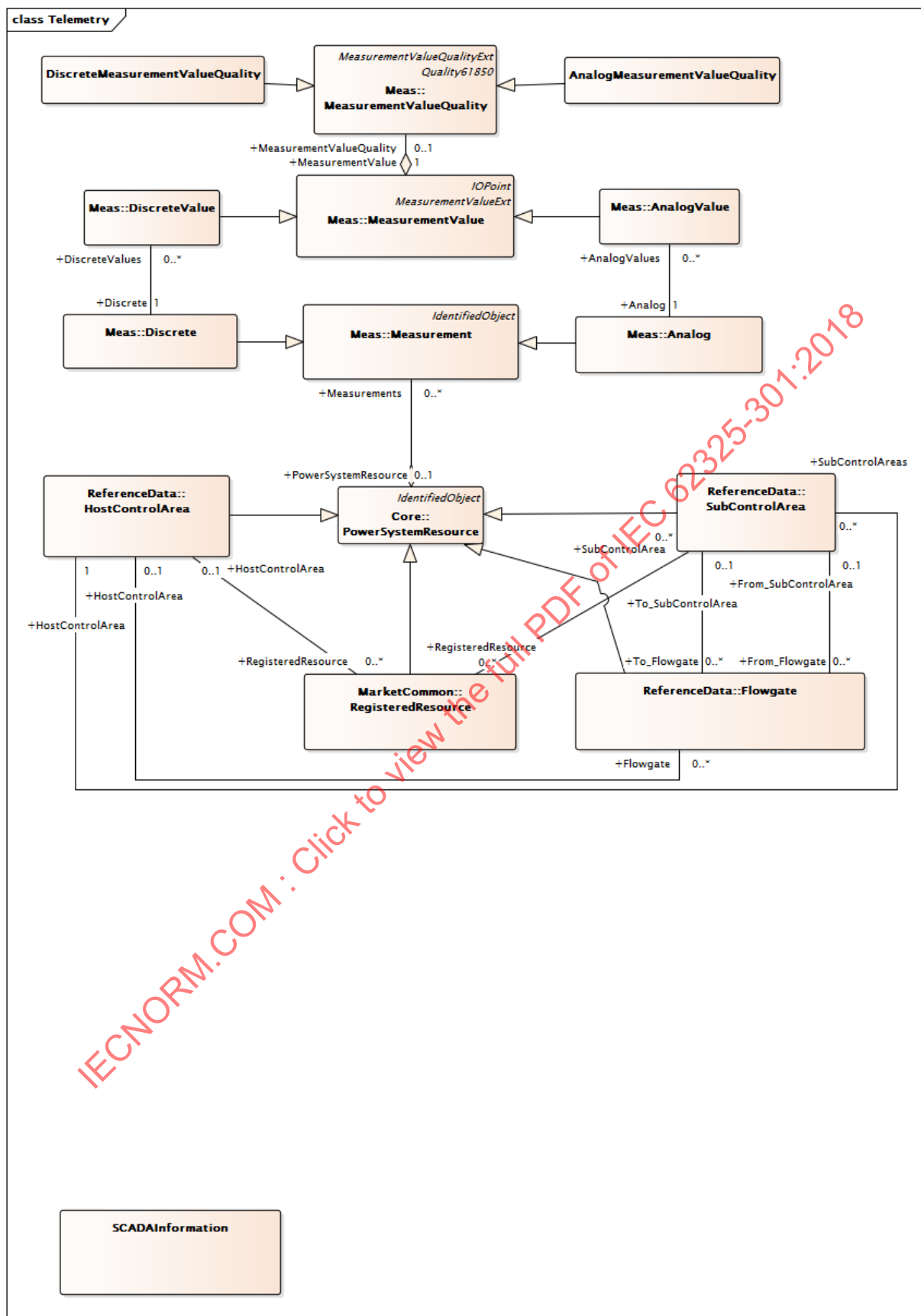


Figure 43 – Diagramme de classe ExternalInputs::Telemetry

Figure 43: représente les classes permettant de modéliser la télémétrie qui peut être utilisée (en cas de défaillance ou d'indisponibilité d'une solution d'estimateur d'état) pour lancer un

processus de marché en temps réel. La figure représente les classes du paquetage IEC 61970 et d'autres classes RegisteredResource et Flowgate spécifiques au marché, ainsi que leurs relations avec les classes des paquetages IEC 61970.

6.5.6.2.2 Classe racine ASRequirements

Modélise les exigences relatives aux services auxiliaires (Ancillary Service Requirements). Décrit l'intervalle pour lequel l'exigence est applicable.

Le Tableau 133 présente tous les attributs de ASRequirements.

Tableau 133 – Attributs de ExternalInputs::ASRequirements

nom	mult	type	description
intervalStartTime	0..1	DateTime	Début de l'intervalle de temps pour lequel l'exigence est définie.

Le Tableau 134 présente toutes les extrémités d'association de ASRequirements avec d'autres classes.

Tableau 134 – Extrémités d'association de ExternalInputs::ASRequirements avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	ReserveDemandCurve	1..*	ReserveDemandCurve	

6.5.6.2.3 AnalogMeasurementValueQuality

Indicateurs de qualité de mesure des valeurs Analog (analogiques).

Le Tableau 135 représente tous les attributs de AnalogMeasurementValueQuality.

Tableau 135 – Attributs de ExternalInputs::AnalogMeasurementValueQuality

nom	mult	type	description
scadaQualityCode	0..1	String	Code de qualité d'une grandeur analogique donnée.
badReference	0..1	Boolean	Hérité de: Quality61850
estimatorReplaced	0..1	Boolean	Hérité de: Quality61850
failure	0..1	Boolean	Hérité de: Quality61850
oldData	0..1	Boolean	Hérité de: Quality61850
operatorBlocked	0..1	Boolean	Hérité de: Quality61850
oscillatory	0..1	Boolean	Hérité de: Quality61850
outOfRange	0..1	Boolean	Hérité de: Quality61850
overflow	0..1	Boolean	Hérité de: Quality61850
source	0..1	Source	Hérité de: Quality61850
suspect	0..1	Boolean	Hérité de: Quality61850
test	0..1	Boolean	Hérité de: Quality61850
validity	0..1	Validity	Hérité de: Quality61850

Le Tableau 136 présente toutes les extrémités d'association de AnalogMeasurementValueQuality avec d'autres classes.

Tableau 136 – Extrémités d'association de ExternalInputs::AnalogMeasurementValueQuality avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	MeasurementValue	1..1	MeasurementValue	Hérité de: MeasurementValueQuality

6.5.6.2.4 AreaLoadCurve

Définition de courbe de charge de zone.

Le Tableau 137 présente tous les attributs de AreaLoadCurve.

Tableau 137 – Attributs de ExternalInputs::AreaLoadCurve

nom	mult	type	description
forecastType	0..1	LoadForecastType	Type de zone de prévision de charge.
endTime	0..1	DateTime	Hérité de: RegularIntervalSchedule
timeStep	0..1	Seconds	Hérité de: RegularIntervalSchedule
startTime	0..1	DateTime	Hérité de: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	Hérité de: BasicIntervalSchedule
Value1Unit	0..1	UnitSymbol	Hérité de: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	Hérité de: BasicIntervalSchedule
Value2Unit	0..1	UnitSymbol	Hérité de: BasicIntervalSchedule
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 138 présente toutes les extrémités d'association de AreaLoadCurve avec d'autres classes.

Tableau 138 – Extrémités d'association de ExternalInputs::AreaLoadCurve avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	AggregateNode	0..1	AggregateNode	
0..*	TACArea	0..1	TACArea	
1..1	TimePoints	1..*	RegularTimePoint	Hérité de: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.5 BaseCaseConstraintLimit

Valeur maximale en MW ou MVA pouvant varier dans le temps et limite minimale facultative en MW ou MVA (Y1 et Y2, respectivement) attribuée à un scénario de base d'analyse de contingence. Utiliser CurveSchedule XAxisUnits pour indiquer des MW ou des MVA. À utiliser uniquement si BaseCaseConstraintLimit diffère de DefaultConstraintLimit.

Le Tableau 139 présente tous les attributs de BaseCaseConstraintLimit.

Tableau 139 – Attributs de ExternalInputs::BaseCaseConstraintLimit

nom	mult	type	description
curveStyle	0..1	CurveStyle	Hérité de: Curve
xMultiplier	0..1	UnitMultiplier	Hérité de: Curve
xUnit	0..1	UnitSymbol	Hérité de: Curve
y1Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y1Unit	0..1	UnitSymbol	Hérité de: Curve
y2Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y2Unit	0..1	UnitSymbol	Hérité de: Curve
y3Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y3Unit	0..1	UnitSymbol	Hérité de: Curve
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 140 présente toutes les extrémités d'association de BaseCaseConstraintLimit avec d'autres classes.

Tableau 140 – Extrémités d'association de ExternalInputs::BaseCaseConstraintLimit avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	SecurityConstraintSum	1..1	SecurityConstraintSum	
1..1	CurveDatas	0..*	CurveData	Hérité de: Curve
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.6 Classe racine BranchEndFlow

Flux et caractéristiques assignées dynamiques associés à l'extrémité d'une branche.

Le Tableau 141 présente tous les attributs de BranchEndFlow.

Tableau 141 – Attributs de ExternalInputs::BranchEndFlow

nom	mult	type	description
mwFlow	0..1	Float	Flux de MW sur la branche Utilisation de l'attribut: Flux de puissance active au niveau de l'appareil, du transformateur, du déphaseur en série ou de l'extrémité ligne
mVARFlow	0..1	Float	Flux MVAR sur la branche Utilisation de l'attribut: Flux de puissance réactive au niveau de l'appareil, du transformateur, du déphaseur en série ou de l'extrémité ligne
normalRating	0..1	Float	Valeur assignée normale de la branche
longTermRating	0..1	Float	Valeur assignée à long terme de la branche
shortTermRating	0..1	Float	Valeur assignée à court terme de la branche
loadDumpRating	0..1	Float	Valeur assignée de perte de charge de la branche

Le Tableau 142 présente toutes les extrémités d'association de BranchEndFlow avec d'autres classes.

Tableau 142 – Extrémités d'association de ExternalInputs::BranchEndFlow avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	MktPowerTransformerEndBFlow	0..*	MktPowerTransformer	
0..1	MktPowerTransformerEndAFlow	0..*	MktPowerTransformer	
0..1	MktACLineSegmentEndAFlow	0..*	MktACLineSegment	
0..1	MktACLineSegmentEndBFlow	0..*	MktACLineSegment	
0..1	MktSeriesCompensatorEndBFlow	0..*	MktSeriesCompensator	
0..1	MktSeriesCompensatorEndAFlow	0..*	MktSeriesCompensator	

6.5.6.2.7 ConstraintTerm

Une condition de contrainte est un élément d'une contrainte linéaire.

Le Tableau 143 présente tous les attributs de ConstraintTerm.

Tableau 143 – Attributs de ExternalInputs::ConstraintTerm

nom	mult	type	description
factor	0..1	String	
function	0..1	String	La fonction est une valeur énumérée qui peut être "active", "reactive" (réactive) ou "VA" pour indiquer le type de flux.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 144 présente toutes les extrémités d'association de ConstraintTerm avec d'autres classes.

Tableau 144 – Extrémités d'association de ExternalInputs::ConstraintTerm avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	SecurityConstraintSum	1..1	SecurityConstraintSum	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.8 ContingencyConstraintLimit

Valeur maximale en MW ou MVA pouvant varier dans le temps et limite minimale facultative en MW ou MVA (Y1 et Y2, respectivement) attribuées à une contrainte pour une contingence spécifique. Utiliser CurveSchedule XAxisUnits pour indiquer des MW ou des MVA.

Le Tableau 145 présente tous les attributs de ContingencyConstraintLimit.

Tableau 145 – Attributs de ExternalInputs::ContingencyConstraintLimit

nom	mult	type	description
curveStyle	0..1	CurveStyle	Hérité de: Curve
xMultiplier	0..1	UnitMultiplier	Hérité de: Curve
xUnit	0..1	UnitSymbol	Hérité de: Curve
y1Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y1Unit	0..1	UnitSymbol	Hérité de: Curve
y2Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y2Unit	0..1	UnitSymbol	Hérité de: Curve
y3Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y3Unit	0..1	UnitSymbol	Hérité de: Curve
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 146 présente toutes les extrémités d'association de ContingencyConstraintLimit avec d'autres classes.

Tableau 146 – Extrémités d'association de ExternalInputs::ContingencyConstraintLimit avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktContingency	1..1	MktContingency	
1..1	MWLimitSchedules	1..1	MWLimitSchedule	
0..*	SecurityConstraintSum	1..1	SecurityConstraintSum	
1..1	CurveDatas	0..*	CurveData	Hérité de: Curve
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.9 Classe racine ControlAreaSolutionData

Échange et pertes du pool de solution d'estimateur d'état

Le Tableau 147 présente tous les attributs de ControlAreaSolutionData.

Tableau 147 – Attributs de ExternalInputs::ControlAreaSolutionData

nom	mult	type	description
solvedLosses	0..1	Float	MW de pertes de pool Utilisation de l'attribut: Pertes de puissance active du pool en MW
solvedInterchange	0..1	Float	Échange en MW du pool Utilisation de l'attribut: Échange de puissance active du pool

Le Tableau 148 présente toutes les extrémités d'association de ControlAreaSolutionData avec d'autres classes.

Tableau 148 – Extrémités d'association de ExternalInputs::ControlAreaSolutionData avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktControlArea	0..1	MktControlArea	

6.5.6.2.10 DefaultBid

DefaultBid (offre par défaut) est une classe générique regroupant Default Energy Bid, Default Startup Bid et Default Minimum Load Bid:

Default Energy Bid

Une DefaultEnergyBid (offre d'énergie par défaut) est une fonction en escalier croissante de façon monotone composée au maximum de 10 segments d'offre évaluée ou de 10 paires (\$/MW, MW). Il existe trois méthodes pour déterminer la DefaultEnergyBid:

- selon les coûts: dérivée de la consommation de chaleur ou du coût moyen multiplié par l'indice de prix du gaz plus 10 %.
- selon les LMP: une moyenne pondérée des LMP au cours des 90 derniers jours
- négocié: un montant négocié avec l'entité indépendante désignée.

Default Startup Bid

Une DSUB (Default Startup Bid – offre de démarrage par défaut) doit être calculée pour chaque unité RMR en fonction du StartUpCost (coût de démarrage) indiqué dans le Master File (fichier maître) et dans le GPI et l'EPI applicables.

Default Minimum Load Bid

Une DMLB (Default Minimum Load Bid – offre minimale de charge par défaut) doit être calculée pour chaque unité RMR en fonction du Minimum Load Cost (coût de charge minimal) indiqué dans le Master File (fichier maître) et dans le GPI applicable.

Le Tableau 149 présente tous les attributs de DefaultBid.

Tableau 149 – Attributs de ExternalInputs::DefaultBid

nom	mult	type	description
bidType	0..1	BidType	Type d'offre par défaut tel que Default Energy Bid, Default Minimum Load Bid et Default Startup Bid
minLoadCost	0..1	CostRate	Coût de charge minimal en \$/h
peakFlag	0..1	OnOff	heures de pointe, heures creuses ou toutes les heures
startTime	0..1	DateTime	Hérité de: Bid
stopTime	0..1	DateTime	Hérité de: Bid
marketType	0..1	MarketType	Hérité de: Bid
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 150 présente toutes les extrémités d'association de DefaultBid avec d'autres classes.

Tableau 150 – Extrémités d'association de ExternalInputs::DefaultBid avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	RegisteredResource	1..1	RegisteredResource	
0..1	DefaultBidCurve	0..1	DefaultBidCurve	
0..*	MarketParticipant	0..1	MarketParticipant	Hérité de: Bid
0..*	EnergyMarket	1..1	EnergyMarket	Hérité de: Bid
0..1	ChargeProfiles	0..*	ChargeProfile	Hérité de: Bid
1..1	MitigatedBidSegment	0..*	MitigatedBidSegment	Hérité de: Bid
0..1	MitigatedBid	0..*	MitigatedBid	Hérité de: Bid
0..1	RMRDetermination	0..*	RMRDetermination	Hérité de: Bid
0..*	ActionRequest	1..1	ActionRequest	Hérité de: Bid
1..1	BidHourlySchedule	0..*	BidHourlySchedule	Hérité de: Bid
1..1	ProductBids	1..*	ProductBid	Hérité de: Bid
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.11 DefaultBidCurve

Courbe d'offre par défaut pour la courbe d'offre d'énergie par défaut et pour les courbes de démarrage par défaut (coût et temps)

Le Tableau 151 présente tous les attributs de DefaultBidCurve.

Tableau 151 – Attributs de ExternalInputs::DefaultBidCurve

nom	mult	type	description
curveType	0..1	String	Pour indiquer un type utilisé pour une courbe d'offre d'énergie par défaut, tel qu'un type basé sur les LMP, les coûts ou la consultation.
debAdderFlag	0..1	YesNo	Indicateur d'additionneur d'offre d'énergie par défaut
curveStyle	0..1	CurveStyle	Hérité de: Curve
xMultiplier	0..1	UnitMultiplier	Hérité de: Curve
xUnit	0..1	UnitSymbol	Hérité de: Curve
y1Multiplier	0..1	UnitMultiplier	Hérité de: Curve

nom	mult	type	description
y1Unit	0..1	UnitSymbol	Hérité de: Curve
y2Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y2Unit	0..1	UnitSymbol	Hérité de: Curve
y3Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y3Unit	0..1	UnitSymbol	Hérité de: Curve
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 152 présente toutes les extrémités d'association de DefaultBidCurve avec d'autres classes.

Tableau 152 – Extrémités d'association de ExternalInputs::DefaultBidCurve avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	DefaultBid	0..1	DefaultBid	
1..1	CurveDatas	0..*	CurveData	Hérité de: Curve
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.12 DefaultBidCurveData

Données de courbe pour la courbe d'offre par défaut et pour la courbe de coût de démarrage.

Le Tableau 153 présente tous les attributs de DefaultBidCurveData.

Tableau 153 – Attributs de ExternalInputs::DefaultBidCurveData

nom	mult	type	description
bidSegmentCalcType	0..1	BidCalculationBasis	Type de base de calcul utilisé pour définir la courbe de segment d'offre par défaut.
xvalue	0..1	Float	Hérité de: CurveData
y1value	0..1	Float	Hérité de: CurveData
y2value	0..1	Float	Hérité de: CurveData
y3value	0..1	Float	Hérité de: CurveData

Le Tableau 154 présente toutes les extrémités d'association de DefaultBidCurveData avec d'autres classes.

Tableau 154 – Extrémités d'association de ExternalInputs::DefaultBidCurveData avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Curve	1..1	Curve	Hérité de: CurveData

6.5.6.2.13 DefaultConstraintLimit

Valeur maximale en MW ou MVA pouvant varier dans le temps et limite minimale facultative en MW ou MVA (Y1 et Y2, respectivement) attribuée à une valeur par défaut si aucune limite de contrainte spécifique n'est indiquée pour une analyse de contingence. Utiliser CurveSchedule XAxisUnits pour indiquer des MW ou des MVA.

Le Tableau 155 présente tous les attributs de DefaultConstraintLimit.

Tableau 155 – Attributs de ExternalInputs::DefaultConstraintLimit

nom	mult	type	description
curveStyle	0..1	CurveStyle	Hérité de: Curve
xMultiplier	0..1	UnitMultiplier	Hérité de: Curve
xUnit	0..1	UnitSymbol	Hérité de: Curve
y1Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y1Unit	0..1	UnitSymbol	Hérité de: Curve
y2Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y2Unit	0..1	UnitSymbol	Hérité de: Curve
y3Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y3Unit	0..1	UnitSymbol	Hérité de: Curve
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 156 présente toutes les extrémités d'association de DefaultConstraintLimit avec d'autres classes.

Tableau 156 – Extrémités d'association de ExternalInputs::DefaultConstraintLimit avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	SecurityConstraintSum	1..1	SecurityConstraintSum	
1..1	CurveDatas	0..*	CurveData	Hérité de: Curve
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.14 DiscreteMeasurementValueQuality

Indicateurs de qualité de mesure des valeurs Discrete (discrètes).

Le Tableau 157 présente tous les attributs de DiscreteMeasurementValueQuality.

Tableau 157 – Attributs de ExternalInputs::DiscreteMeasurementValueQuality

nom	mult	type	description
manualReplaceIndicator	0..1	Boolean	Indicateur de remplacement manuel du commutateur. Indicateur précisant que le commutateur est à remplacement manuel.
removeFromOperationIndicator	0..1	Boolean	Indicateur de mise hors service. Indicateur précisant que le commutateur a été mis hors service.
badReference	0..1	Boolean	Hérité de: Quality61850
estimatorReplaced	0..1	Boolean	Hérité de: Quality61850
failure	0..1	Boolean	Hérité de: Quality61850
oldData	0..1	Boolean	Hérité de: Quality61850
operatorBlocked	0..1	Boolean	Hérité de: Quality61850
oscillatory	0..1	Boolean	Hérité de: Quality61850
outOfRange	0..1	Boolean	Hérité de: Quality61850
overflow	0..1	Boolean	Hérité de: Quality61850
source	0..1	Source	Hérité de: Quality61850
suspect	0..1	Boolean	Hérité de: Quality61850
test	0..1	Boolean	Hérité de: Quality61850
validity	0..1	Validity	Hérité de: Quality61850

Le Tableau 158 présente toutes les extrémités d'association de DiscreteMeasurementValueQuality avec d'autres classes.

Tableau 158 – Extrémités d'association de ExternalInputs::DiscreteMeasurementValueQuality avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	MeasurementValue	1..1	MeasurementValue	Hérité de: MeasurementValueQuality

6.5.6.2.15 Classe racine DistributionFactorSet

Classe principale regroupant tous les facteurs de distribution d'un marché.

Elle est calculée tous les jours pour les facteurs DA et toutes les heures pour les facteurs RT.

Le Tableau 159 présente tous les attributs de DistributionFactorSet.

Tableau 159 – Attributs de ExternalInputs::DistributionFactorSet

nom	mult	type	description
intervalStartTime	0..1	DateTime	Début de l'intervalle de temps pour lequel une exigence est définie.
intervalEndTime	0..1	DateTime	Fin de l'intervalle de temps pour lequel une exigence est définie.
marketType	0..1	MarketType	Type de marché.

Le Tableau 160 présente toutes les extrémités d'association de DistributionFactorSet avec d'autres classes.

Tableau 160 – Extrémités d'association de ExternalInputs::DistributionFactorSet avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	GenDistributionFactor	0..*	GenDistributionFactor	
0..*	SysLoadDistribuFactor	0..*	SysLoadDistributionFactor	
0..*	LoadDistributionFactor	0..*	LoadDistributionFactor	

6.5.6.2.16 EnergyPriceIndex

Un EnergyPriceIndex (indice du prix de l'énergie) pour chaque ressource est valide pour une période (quotidiennement, par exemple) identifiée par une Valid Period Start Time (heure de démarrage de période valide) et par une Valid Period End Time (heure de fin de période valide). L'indice du prix de l'énergie est exprimé en \$/MWh.

Le Tableau 161 présente tous les attributs de EnergyPriceIndex.

Tableau 161 – Attributs de ExternalInputs::EnergyPriceIndex

nom	mult	type	description
energyPriceIndex	0..1	Float	Indice du prix de l'énergie
energyPriceIndexType	0..1	EnergyPriceIndexType	Type d'EPI (gros ou détail)
lastModified	0..1	DateTime	Mise à jour de l'heure
validPeriod	0..1	DateTimeInterval	Période de validité de l'indice du prix de l'énergie.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 162 présente toutes les extrémités d'association de EnergyPriceIndex avec d'autres classes.

Tableau 162 – Extrémités d'association de ExternalInputs::EnergyPriceIndex avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	RegisteredGenerator	1..1	RegisteredGenerator	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.17 EnergyProfile

Indique l'heure de début, l'heure d'arrêt et le niveau d'EnergyTransaction.

Le Tableau 163 présente tous les attributs de EnergyProfile.

Tableau 163 – Attributs de ExternalInputs::EnergyProfile

nom	mult	type	description
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 164 présente toutes les extrémités d'association de EnergyProfile avec d'autres classes.

Tableau 164 – Extrémités d'association de ExternalInputs::EnergyProfile avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	TransactionBid	1..1	TransactionBid	
1..*	EnergyTransaction	1..1	EnergyTransaction	Une EnergyTransaction doit avoir au moins un EnergyProfile.
0..*	ProfileDatas	0..*	ProfileData	Hérité de: Profile
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.18 EnergyTransaction

Indique le programme des transferts d'énergie entre les zones d'échange qui sont nécessaires pour réaliser la transaction d'échange associée.

Le Tableau 165 présente tous les attributs de EnergyTransaction.

Tableau 165 – Attributs de ExternalInputs::EnergyTransaction

nom	mult	type	description
capacityBacked	0..1	Boolean	Indicateur de capacité d'échange. Lorsque l'indicateur est défini sur True, cela signifie qu'une transaction est suivie par la fourniture de la capacité demandée.
congestChargeMax	0..1	Money	Frais de congestion maximum en unités monétaires.
deliveryPointP	0..1	ActivePower	Puissance active au point de livraison.
energyMin	0..1	ActivePower	Puissance active minimale d'une transaction si elle est répartissable.
firmInterchangeFlag	0..1	Boolean	L'indicateur d'échange ferme précise si cette transaction d'énergie peut être modifiée sans conséquences financières éventuelles.
payCongestion	0..1	Boolean	Indicateur de congestion Willing to Pay (Disposé à payer).
reason	0..1	String	Motif de la transaction d'énergie.
receiptPointP	0..1	ActivePower	Puissance active au point de réception.
state	0..1	EnergyTransactionType	{ Approbation Négation Étude }
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 166 présente toutes les extrémités d'association de EnergyTransaction avec d'autres classes.

**Tableau 166 – Extrémités d'association de ExternalInputs::
EnergyTransaction avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	EnergyPriceCurves	0..*	EnergyPriceCurve	
1..1	EnergyProfiles	1..*	EnergyProfile	Une EnergyTransaction doit avoir au moins un EnergyProfile.
0..*	Export_SubControlArea	1..1	SubControlArea	L'énergie est transférée entre les zones d'échange.
0..*	Import_SubControlArea	1..1	SubControlArea	L'énergie est transférée entre les zones d'échange.
0..1	TransmissionReservation	0..1	TransmissionReservation	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.19 Classe racine GenDistributionFactor

Cette classe modélise les facteurs de distribution de production. Elle nécessite d'être utilisée avec AggregatedPnode et IndividualPnode pour indiquer la distribution de chaque partie individuelle.

Le Tableau 167 présente tous les attributs de GenDistributionFactor.

Tableau 167 – Attributs de ExternalInputs::GenDistributionFactor

nom	mult	type	description
factor	0..1	Float	Utilisé pour calculer la "participation" de production d'un Pnode individuel dans un AggregatePnode.

Le Tableau 168 présente toutes les extrémités d'association de GenDistributionFactor avec d'autres classes.

Tableau 168 – Extrémités d'association de ExternalInputs::GenDistributionFactor avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	DistributionFactorSet	0..*	DistributionFactorSet	
1..*	AggregatedPnode	0..1	AggregatedPnode	
0..1	IndividualPnode	0..1	IndividualPnode	

6.5.6.2.20 Classe racine GeneratingUnitDynamicValues

Optimal Power Flow ou State Estimator Unit Data pour le simulateur de formation des exploitants (OTS – Operator Training Simulator). Utilisée pour les utilisateurs RealTime, Study et Maintenance.

Le Tableau 169 présente tous les attributs de GeneratingUnitDynamicValues.

Tableau 169 – Attributs de ExternalInputs::GeneratingUnitDynamicValues

nom	mult	type	description
lossFactor	0..1	Float	Facteur de perte
maximumMW	0..1	Float	Production de puissance active maximale de l'unité en MW
minimumMW	0..1	Float	Production de puissance active minimale de l'unité en MW
mVAR	0..1	Float	Production de puissance réactive de l'unité en MVAR
mw	0..1	Float	Production de puissance active de l'unité en MW
sensitivity	0..1	Float	Facteur de sensibilité de l'unité. Facteurs de distribution (DFAX) de l'unité

Le Tableau 170 présente toutes les extrémités d'association de GeneratingUnitDynamicValues avec d'autres classes.

Tableau 170 – Extrémités d'association de ExternalInputs::GeneratingUnitDynamicValues avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktGeneratingUnit	1..1	MktGeneratingUnit	
0..*	Flowgate	0..1	Flowgate	

6.5.6.2.21 GenericConstraints

Les contraintes génériques peuvent représenter des zones sécurisées, un profil de tension, une stabilité transitoire et des limites de chute de tension.

Les contraintes génériques peuvent avoir l'une des formes suivantes:

- Limites thermiques en MW
- Contrainte type de flux de ligne de groupe

Le Tableau 171 présente tous les attributs de GenericConstraints.

Tableau 171 – Attributs de ExternalInputs::GenericConstraints

nom	mult	type	description
intervalEndTime	0..1	DateTime	Heure de fin de l'intervalle
intervalStartTime	0..1	DateTime	Heure de début de l'intervalle
maxLimit	0..1	Float	Limite maximale (MW)
minLimit	0..1	Float	Limite minimale (MW)
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 172 présente toutes les extrémités d'association de GenericConstraints avec d'autres classes.

Tableau 172 – Extrémités d'association de ExternalInputs::GenericConstraints avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	Flowgate	0..*	Flowgate	
0..1	TransmissionCapacity	0..*	TransmissionCapacity	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.22 Classe racine InterchangeETCData

Données de contrat de transport existant pour un programme d'échange

Le Tableau 173 présente tous les attributs de InterchangeETCData.

Tableau 173 – Attributs de ExternalInputs::InterchangeETCData

nom	mult	type	description
contractNumber	0..1	String	Numéro de contrat de transport existant
usageMW	0..1	Float	Valeur en MW de l'utilisation du contrat de transport existant

Le Tableau 174 présente toutes les extrémités d'association de InterchangeETCData avec d'autres classes.

Tableau 174 – Extrémités d'association de ExternalInputs::InterchangeETCData avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	InterchangeSchedule	0..1	InterchangeSchedule	

6.5.6.2.23 InterchangeSchedule

Classe de programme d'échange pour stocker des informations sur les programmes d'échange de type import/export, énergie, etc.

Le Tableau 175 présente tous les attributs de InterchangeSchedule.

Tableau 175 – Attributs de ExternalInputs::InterchangeSchedule

nom	mult	type	description
checkOutType	0..1	CheckOutType	Pour indiquer un type de vérification tel que la capacité ajustée ou la capacité de répartition.
directionType	0..1	InterTieDirection	Import ou export.
energyType	0..1	MarketProductType	Type de produit énergétique.
intervalLength	0..1	Integer	Longueur de l'intervalle.
marketType	0..1	MarketType	Type de marché.
operatingDate	0..1	DateTime	Date/heure d'exploitation.
outOfMarketType	0..1	Boolean	Pour indiquer un programme hors marché (OOM – Out-Of-Market).
scheduleType	0..1	EnergyProductType	Type de programme.
wcrid	0..1	String	Identifiant compteur-ressource de transit (exigé lorsque Type de programme = Transit).
curveStyle	0..1	CurveStyle	Hérité de: Curve
xMultiplier	0..1	UnitMultiplier	Hérité de: Curve
xUnit	0..1	UnitSymbol	Hérité de: Curve
y1Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y1Unit	0..1	UnitSymbol	Hérité de: Curve
y2Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y2Unit	0..1	UnitSymbol	Hérité de: Curve
y3Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y3Unit	0..1	UnitSymbol	Hérité de: Curve
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 176 présente toutes les extrémités d'association de InterchangeSchedule avec d'autres classes.

Tableau 176 – Extrémités d'association de ExternalInputs::InterchangeSchedule avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	InterchangeETCData	0..*	InterchangeETCData	
0..*	InterTie	0..1	SchedulingPoint	
0..*	RegisteredInterTie	0..1	RegisteredInterTie	
1..1	CurveDatas	0..*	CurveData	Hérité de: Curve
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.24 IntermittentResourceEligibility

Indique si l'unité est susceptible d'être considérée comme une ressource renouvelable variable intermittente

Le Tableau 177 présente tous les attributs de IntermittentResourceEligibility.

Tableau 177 – Attributs de ExternalInputs::IntermittentResourceEligibility

nom	mult	type	description
eligibilityStatus	0..1	String	Indique si une ressource est susceptible d'être admise dans le programme PIRP à une heure donnée
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 178 présente toutes les extrémités d'association de IntermittentResourceEligibility avec d'autres classes.

**Tableau 178 – Extrémités d'association de
ExternallInputs::IntermittentResourceEligibility avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	1..1	RegisteredResource	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.25 Classe racine LoadDistributionFactor

Cette classe modélise les facteurs de distribution de charge. Il convient de l'utiliser de l'une des manières suivantes:

Utilisation avec AggregatedPnode et IndividualPnode pour indiquer la distribution de chaque partie individuelle

OU

Utilisation avec Mkt_EnergyConsumer pour représenter la distribution actuelle MW/Mvar dans son groupe de charge parent.

Le Tableau 179 présente tous les attributs de LoadDistributionFactor.

Tableau 179 – Attributs de ExternallInputs::LoadDistributionFactor

nom	mult	type	description
pDistFactor	0..1	Float	Facteur de distribution de charge de puissance réelle (MW)
qDistFactor	0..1	Float	Facteur de distribution de charge de puissance réactive (MVar)

Le Tableau 180 présente toutes les extrémités d'association de LoadDistributionFactor avec d'autres classes.

Tableau 180 – Extrémités d'association de ExternalInputs::LoadDistributionFactor avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	DistributionFactorSet	0..*	DistributionFactorSet	
0..1	IndividualPnode	0..1	IndividualPnode	
1..*	AggregatedPnode	0..1	AggregatedPnode	

6.5.6.2.26 LossSensitivity

Sensibilité de perte appliquée à ConnectivityNode pour un intervalle de temps donné.

Le Tableau 181 présente tous les attributs de LossSensitivity.

Tableau 181 – Attributs de ExternalInputs::LossSensitivity

nom	mult	type	description
lossFactor	0..1	Float	Facteur de pénalité de perte. Défini de la manière suivante: $1 / (1 - \text{perte de transport différentielle})$; la perte de transport différentielle est exprimée en valeur plus/moins. Les facteurs de pénalité types sont compris entre (0,9 et 1,1).
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 182 présente toutes les extrémités d'association de LossSensitivity avec d'autres classes.

Tableau 182 – Extrémités d'association de ExternalInputs::LossSensitivity avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktConnectivityNode	1..1	MktConnectivityNode	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.27 Classe racine MWLimitSchedule

Valeur maximale de MW et valeur facultative minimale de MW (Y1 et Y2, respectivement)

Le Tableau 183 présente toutes les extrémités d'association de MWLimitSchedule avec d'autres classes.

Tableau 183 – Extrémités d'association de ExternalInputs::MWLimitSchedule avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	SecurityConstraintLimit	1..1	ContingencyConstraintLimit	

6.5.6.2.28 MktACLineSegment

Sous-classe de IEC61970:Wires:ACLineSegment

Le Tableau 184 présente tous les attributs de MktACLineSegment.

Tableau 184 – Attributs de ExternalInputs::MktACLineSegment

nom	mult	type	description
b0ch	0..1	Susceptance	Hérité de: ACLineSegment
bch	0..1	Susceptance	Hérité de: ACLineSegment
g0ch	0..1	Conductance	Hérité de: ACLineSegment
gch	0..1	Conductance	Hérité de: ACLineSegment
r	0..1	Resistance	Hérité de: ACLineSegment
r0	0..1	Resistance	Hérité de: ACLineSegment
shortCircuitEndTemperature	0..1	Temperature	Hérité de: ACLineSegment
x	0..1	Reactance	Hérité de: ACLineSegment

nom	mult	type	description
x0	0..1	Reactance	Hérité de: ACLineSegment
length	0..1	Length	Hérité de: Conductor
aggregate	0..1	Boolean	Hérité de: Equipment
inService	0..1	Boolean	Hérité de: Equipment
networkAnalysisEnabled	0..1	Boolean	Hérité de: Equipment
normallyInService	0..1	Boolean	Hérité de: Equipment
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 185 présente toutes les extrémités d'association de MktACLineSegment avec d'autres classes.

**Tableau 185 – Extrémités d'association de ExternalInputs::
MktACLineSegment avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	EndAFlow	0..1	BranchEndFlow	
0..*	EndBFlow	0..1	BranchEndFlow	
1..1	Clamp	0..*	Clamp	Hérité de: ACLineSegment
0..*	PerLengthImpedance	0..1	PerLengthImpedance	Hérité de: ACLineSegment
1..1	Cut	0..*	Cut	Hérité de: ACLineSegment
0..1	LineFaults	0..*	LineFault	Hérité de: ACLineSegment
1..1	ACLineSegmentPhases	0..*	ACLineSegmentPhases	Hérité de: ACLineSegment
0..*	BaseVoltage	0..1	BaseVoltage	Hérité de: ConductingEquipment
1..1	SvStatus	0..*	SvStatus	Hérité de: ConductingEquipment
0..*	ProtectionEquipments	0..*	ProtectionEquipment	Hérité de: ConductingEquipment
1..1	Terminals	0..*	Terminal	Hérité de: ConductingEquipment
0..1	OperationalLimitSet	0..*	OperationalLimitSet	Hérité de: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	Hérité de: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	Hérité de: Equipment
0..1	Faults	0..*	Fault	Hérité de: Equipment
0..*	AdditionalEquipmentContained	0..*	EquipmentContained	Hérité de: Equipment
0..*	PSRType	0..1	PSRType	Hérité de: PowerSystemResource
0..1	Controls	0..*	Control	Hérité de: PowerSystemResource
0..1	Measurements	0..*	Measurement	Hérité de: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	Hérité de: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	Hérité de: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.29 MktAnalogLimit

Sous-classe de IEC 61970:Meas:AnalogLimit

Le Tableau 186 présente tous les attributs de MktAnalogLimit.

Tableau 186 – Attributs de ExternalInputs::MktAnalogLimit

nom	mult	type	description
exceededLimit	0..1	Boolean	True si les limites sont dépassées
limitType	0..1	AnalogLimitType	Le type de limite que la valeur représente Types de limites de branche: Court terme Moyen terme Long terme Limites de tension: Haute Basse
value	0..1	Float	Hérité de: AnalogLimit
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 187 présente toutes les extrémités d'association de MktAnalogLimit avec d'autres classes.

Tableau 187 – Extrémités d'association de ExternalInputs::MktAnalogLimit avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	LimitSet	1..1	AnalogLimitSet	Hérité de: AnalogLimit
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.30 MktAnalogLimitSet

Sous-classe de IEC 61970:Meas:AnalogLimitSet

Le Tableau 188 présente tous les attributs de MktAnalogLimitSet.

Tableau 188 – Attributs de ExternalInputs::MktAnalogLimitSet

nom	mult	type	description
ratingSet	0..1	Integer	Nombre de l'ensemble de valeurs assignées
isPercentageLimits	0..1	Boolean	Hérité de: LimitSet
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 189 présente toutes les extrémités d'association de MktAnalogLimitSet avec d'autres classes.

Tableau 189 – Extrémités d'association de ExternalInputs::MktAnalogLimitSet avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	Limits	0..*	AnalogLimit	Hérité de: AnalogLimitSet
0..*	Measurements	0..*	Analog	Hérité de: AnalogLimitSet
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.31 MktControlArea

Sous-classe de marché de IEC 61970:ControlArea

Le Tableau 190 présente tous les attributs de MktControlArea.

Tableau 190 – Attributs de ExternalInputs::MktControlArea

nom	mult	type	description
netInterchange	0..1	ActivePower	Hérité de: ControlArea
pTolerance	0..1	ActivePower	Hérité de: ControlArea
type	0..1	ControlAreaTypeKind	Hérité de: ControlArea
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 191 présente toutes les extrémités d'association de MktControlArea avec d'autres classes.

Tableau 191 – Extrémités d'association de ExternalInputs::MktControlArea avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	ControlAreaSolutionData	0..*	ControlAreaSolutionData	
0..1	EnergyArea	0..1	EnergyArea	Hérité de: ControlArea
1..1	ControlAreaGeneratingUnit	0..*	ControlAreaGeneratingUnit	Hérité de: ControlArea
1..1	TieFlow	0..*	TieFlow	Hérité de: ControlArea
0..*	PSRType	0..1	PSRType	Hérité de: PowerSystemResource
0..1	Controls	0..*	Control	Hérité de: PowerSystemResource
0..1	Measurements	0..*	Measurement	Hérité de: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	Hérité de: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	Hérité de: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.32 MktSeriesCompensator

Sous-classe de IEC 61970:Wires:SeriesCompensator

Le Tableau 192 présente tous les attributs de MktSeriesCompensator.

Tableau 192 – Attributs de ExternalInputs::MktSeriesCompensator

nom	mult	type	description
r	0..1	Resistance	Hérité de: SeriesCompensator
r0	0..1	Resistance	Hérité de: SeriesCompensator
x	0..1	Reactance	Hérité de: SeriesCompensator
x0	0..1	Reactance	Hérité de: SeriesCompensator
varistorPresent	0..1	Boolean	Hérité de: SeriesCompensator
varistorRatedCurrent	0..1	CurrentFlow	Hérité de: SeriesCompensator
varistorVoltageThreshold	0..1	Voltage	Hérité de: SeriesCompensator
aggregate	0..1	Boolean	Hérité de: Equipment
inService	0..1	Boolean	Hérité de: Equipment
networkAnalysisEnabled	0..1	Boolean	Hérité de: Equipment
normallyInService	0..1	Boolean	Hérité de: Equipment
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 193 présente toutes les extrémités d'association de MktSeriesCompensator avec d'autres classes.

**Tableau 193 – Extrémités d'association de ExternalInputs::
MktSeriesCompensator avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	EndBFlow	0..1	BranchEndFlow	
0..*	EndAFlow	0..1	BranchEndFlow	
0..*	BaseVoltage	0..1	BaseVoltage	Hérité de: ConductingEquipment
1..1	SvStatus	0..*	SvStatus	Hérité de: ConductingEquipment
0..*	ProtectionEquipments	0..*	ProtectionEquipment	Hérité de: ConductingEquipment
1..1	Terminals	0..*	Terminal	Hérité de: ConductingEquipment
0..1	OperationalLimitSet	0..*	OperationalLimitSet	Hérité de: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	Hérité de: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	Hérité de: Equipment
0..1	Faults	0..*	Fault	Hérité de: Equipment
0..*	AdditionalEquipmentContainer	0..*	EquipmentContainer	Hérité de: Equipment
0..*	PSRType	0..1	PSRType	Hérité de: PowerSystemResource
0..1	Controls	0..*	Control	Hérité de: PowerSystemResource
0..1	Measurements	0..*	Measurement	Hérité de: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	Hérité de: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	Hérité de: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.33 MktShuntCompensator

Sous-classe de IEC 61970:Wires:ShuntCompensator

Le Tableau 194 présente tous les attributs de MktShuntCompensator.

Tableau 194 – Attributs de ExternalInputs::MktShuntCompensator

nom	mult	type	description
aVRDelay	0..1	Seconds	Hérité de: ShuntCompensator
grounded	0..1	Boolean	Hérité de: ShuntCompensator
maximumSections	0..1	Integer	Hérité de: ShuntCompensator
nomU	0..1	Voltage	Hérité de: ShuntCompensator
normalSections	0..1	Integer	Hérité de: ShuntCompensator
phaseConnection	0..1	PhaseShuntConnectionKind	Hérité de: ShuntCompensator
switchOnCount	0..1	Integer	Hérité de: ShuntCompensator
switchOnDate	0..1	DateTime	Hérité de: ShuntCompensator
voltageSensitivity	0..1	VoltagePerReactivePower	Hérité de: ShuntCompensator
sections	0..1	Float	Hérité de: ShuntCompensator
controlEnabled	0..1	Boolean	Hérité de: RegulatingCondEq
aggregate	0..1	Boolean	Hérité de: Equipment
inService	0..1	Boolean	Hérité de: Equipment
networkAnalysisEnabled	0..1	Boolean	Hérité de: Equipment
normallyInService	0..1	Boolean	Hérité de: Equipment
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 195 présente toutes les extrémités d'association de MktShuntCompensator avec d'autres classes.

Tableau 195 – Extrémités d'association de ExternalInputs::MktShuntCompensator avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	ShuntCompensatorDynamicData	0..*	ShuntCompensatorDynamicData	
1..1	ShuntCompensatorPhase	0..*	ShuntCompensatorPhase	Hérité de: ShuntCompensator
1..1	SvShuntCompensatorSections	0..1	SvShuntCompensatorSections	Hérité de: ShuntCompensator
0..*	RegulatingControl	0..1	RegulatingControl	Hérité de: RegulatingCondEq
0..*	BaseVoltage	0..1	BaseVoltage	Hérité de: ConductingEquipment
1..1	SvStatus	0..*	SvStatus	Hérité de: ConductingEquipment
0..*	ProtectionEquipments	0..*	ProtectionEquipment	Hérité de: ConductingEquipment
1..1	Terminals	0..*	Terminal	Hérité de: ConductingEquipment
0..1	OperationalLimitSet	0..*	OperationalLimitSet	Hérité de: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	Hérité de: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	Hérité de: Equipment
0..1	Faults	0..*	Fault	Hérité de: Equipment

mult à partir de	nom	mult vers	type	description
0..*	AdditionalEquipmentContainer	0..*	EquipmentContainer	Hérité de: Equipment
0..*	PSRType	0..1	PSRType	Hérité de: PowerSystemResource
0..1	Controls	0..*	Control	Hérité de: PowerSystemResource
0..1	Measurements	0..*	Measurement	Hérité de: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	Hérité de: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	Hérité de: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.34 MktSwitch

Sous-classe de IEC 61970:Wires:Switch

Le Tableau 196 présente tous les attributs de MktSwitch.

Tableau 196 – Attributs de ExternalInputs::MktSwitch

nom	mult	type	description
normalOpen	0..1	Boolean	Hérité de: Switch
ratedCurrent	0..1	CurrentFlow	Hérité de: Switch
switchOnCount	0..1	Integer	Hérité de: Switch
switchOnDate	0..1	DateTime	Hérité de: Switch
retained	0..1	Boolean	Hérité de: Switch
open	0..1	Boolean	Hérité de: Switch
aggregate	0..1	Boolean	Hérité de: Equipment
inService	0..1	Boolean	Hérité de: Equipment
networkAnalysisEnabled	0..1	Boolean	Hérité de: Equipment
normallyInService	0..1	Boolean	Hérité de: Equipment
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 197 présente toutes les extrémités d'association de MktSwitch avec d'autres classes.

Tableau 197 – Extrémités d'association de ExternalInputs::MktSwitch avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	SwitchStatus	0..*	SwitchStatus	
1..1	SwitchSchedules	0..*	SwitchSchedule	Hérité de: Switch
1..1	SwitchPhase	0..*	SwitchPhase	Hérité de: Switch
0..*	CompositeSwitch	0..1	CompositeSwitch	Hérité de: Switch
0..*	BaseVoltage	0..1	BaseVoltage	Hérité de: ConductingEquipment
1..1	SvStatus	0..*	SvStatus	Hérité de: ConductingEquipment
0..*	ProtectionEquipments	0..*	ProtectionEquipment	Hérité de: ConductingEquipment
1..1	Terminals	0..*	Terminal	Hérité de: ConductingEquipment
0..1	OperationalLimitSet	0..*	OperationalLimitSet	Hérité de: Equipment
1..1	ContingencyEquipment	0..*	ContingencyEquipment	Hérité de: Equipment
0..*	EquipmentContainer	0..1	EquipmentContainer	Hérité de: Equipment
0..1	Faults	0..*	Fault	Hérité de: Equipment
0..*	AdditionalEquipmentContainer	0..*	EquipmentContainer	Hérité de: Equipment
0..*	PSRType	0..1	PSRType	Hérité de: PowerSystemResource
0..1	Controls	0..*	Control	Hérité de: PowerSystemResource
0..1	Measurements	0..*	Measurement	Hérité de: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	Hérité de: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	Hérité de: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.35 MktTapChanger

Sous-classe de IEC 61970:Wires:TapChanger

Le Tableau 198 présente tous les attributs de MktTapChanger.

Tableau 198 – Attributs de ExternalInputs::MktTapChanger

nom	mult	type	description
controlEnabled	0..1	Boolean	Hérité de: TapChanger
highStep	0..1	Integer	Hérité de: TapChanger
initialDelay	0..1	Seconds	Hérité de: TapChanger
lowStep	0..1	Integer	Hérité de: TapChanger
lrcFlag	0..1	Boolean	Hérité de: TapChanger
neutralStep	0..1	Integer	Hérité de: TapChanger
neutralU	0..1	Voltage	Hérité de: TapChanger
normalStep	0..1	Integer	Hérité de: TapChanger
subsequentDelay	0..1	Seconds	Hérité de: TapChanger

nom	mult	type	description
step	0..1	Float	Hérité de: TapChanger
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 199 présente toutes les extrémités d'association de MktTapChanger avec d'autres classes.

**Tableau 199 – Extrémités d'association de ExternalInputs::
MktTapChanger avec d'autres classes**

mult à partir de	nom	mult vers	type	description
1..1	TapChangerDynamicData	0..*	TapChangerDynamicData	
0..*	TapChangerControl	0..1	TapChangerControl	Hérité de: TapChanger
1..1	TapSchedules	0..*	TapSchedule	Hérité de: TapChanger
1..1	SvTapStep	0..1	SvTapStep	Hérité de: TapChanger
0..*	PSRType	0..1	PSRType	Hérité de: PowerSystemResource
0..1	Controls	0..*	Control	Hérité de: PowerSystemResource
0..1	Measurements	0..*	Measurement	Hérité de: PowerSystemResource
1..1	OperatingShare	0..*	OperatingShare	Hérité de: PowerSystemResource
0..*	ReportingGroup	0..*	ReportingGroup	Hérité de: PowerSystemResource
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.36 NodeConstraintTerm

À utiliser uniquement pour limiter une quantité qui ne peut pas être associée à une borne. Par exemple, une unité de production enregistrée qui n'est pas connectée électriquement au réseau.

Le Tableau 200 présente tous les attributs de NodeConstraintTerm.

Tableau 200 – Attributs de ExternalInputs::NodeConstraintTerm

nom	mult	type	description
factor	0..1	String	Hérité de: ConstraintTerm
function	0..1	String	Hérité de: ConstraintTerm
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 201 présente toutes les extrémités d'association de NodeConstraintTerm avec d'autres classes.

Tableau 201 – Extrémités d'association de ExternalInputs::NodeConstraintTerm avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktConnectivityNode	1..1	MktConnectivityNode	
0..*	SecurityConstraintSum	1..1	SecurityConstraintSum	Hérité de: ConstraintTerm
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.37 Profile

Un profil est un type de courbe plus simple.

Le Tableau 202 présente tous les attributs de Profile.

Tableau 202 – Attributs de ExternalInputs::Profile

nom	mult	type	description
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 203 présente toutes les extrémités d'association de Profile avec d'autres classes.

Tableau 203 – Extrémités d'association de ExternalInputs::Profile avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	ProfileDatas	0..*	ProfileData	Un profil a des données de profil qui lui sont associées.
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.38 Classe racine ProfileData

Données de profil.

Le Tableau 204 présente tous les attributs de ProfileData.

Tableau 204 – Attributs de ExternalInputs::ProfileData

nom	mult	type	description
bidPrice	0..1	Float	Prix d'offre associé au contrat
capacityLevel	0..1	ActivePower	Niveau de capacité du profil, en MW.
energyLevel	0..1	RealEnergy	Niveau d'énergie du profil, en MWh.
minimumLevel	0..1	Float	Valeur minimale du contrat en MW
sequenceNumber	0..1	Integer	Séquence pour numérotier les éléments du profil. { supérieur ou égal à 1 }
startDateTime	0..1	DateTime	Date/heure de début pour ce profil.
stopDateTime	0..1	DateTime	Date/heure d'arrêt pour ce profil.

Le Tableau 205 présente toutes les extrémités d'association de ProfileData avec d'autres classes.

Tableau 205 – Extrémités d'association de ExternalInputs::ProfileData avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Profile	0..*	Profile	Un profil a des données de profil qui lui sont associées.

6.5.6.2.39 ReserveDemandCurve

Courbe de demande de réserve. Modélise les quantités maximales de réserve exigées par Market Region (région de marché) et modélise une courbe de demande de réserve pour les quantités minimales de réserve. ReserveDemandCurve est une relation entre le prix de réserve d'exploitation de l'unité en \$/MWh (axe Y) et les réserves de l'unité en MW (axe X).

Le Tableau 206 présente tous les attributs de ReserveDemandCurve.

Tableau 206 – Attributs de ExternalInputs::ReserveDemandCurve

nom	mult	type	description
reqMaxMW	0..1	Float	Limite maximale de l'exigence régionale
reserveRequirementType	0..1	ReserveRequirementType	Type d'exigences de réserve auquel s'appliquent la limite max et la courbe. Par exemple, réserve d'exploitation, régulation et contingence.
curveStyle	0..1	CurveStyle	Hérité de: Curve
xMultiplier	0..1	UnitMultiplier	Hérité de: Curve
xUnit	0..1	UnitSymbol	Hérité de: Curve
y1Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y1Unit	0..1	UnitSymbol	Hérité de: Curve
y2Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y2Unit	0..1	UnitSymbol	Hérité de: Curve
y3Multiplier	0..1	UnitMultiplier	Hérité de: Curve
y3Unit	0..1	UnitSymbol	Hérité de: Curve

nom	mult	type	description
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 207 présente toutes les extrémités d'association de ReserveDemandCurve avec d'autres classes.

Tableau 207 – Extrémités d'association de ExternalInputs:: ReserveDemandCurve avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	ASRequirements	1..1	ASRequirements	
0..*	MarketRegion	1..1	MarketRegion	
1..1	CurveDatas	0..*	CurveData	Hérité de: Curve
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.40 Classe racine SCADAInformation

Contient des informations de mise à jour indiquées par SCADA

Le Tableau 208 présente tous les attributs de SCADAInformation.

Tableau 208 – Attributs de ExternalInputs::SCADAInformation

nom	mult	type	description
timeStamp	0..1	DateTime	Heure de mise à jour indiquée par SCADA

6.5.6.2.41 SecurityConstraintSum

Généralement fournies par les systèmes des RTO, les contraintes identifiées dans le scénario de base et dans les scénarios de contingence critique doivent être transférées.

Une contrainte a N (≥ 1) conditions de contraintes. Une condition est représentée par une instance de TerminalConstraintTerm.

L'expression de la contrainte est la suivante:

$$\text{minValue} \leq c1 \cdot x1 + c2 \cdot x2 + \dots cn \cdot xn + k \leq \text{maxValue}$$

où:

- cn est ConstraintTerm.factor
- xn est le flux de la borne

Le flux de l'équipement associé est positif pour NodeConstraintTerm de ConnectivityNode

k est SecurityConstraintsLinear.resourceMW

Les unités de k sont censées être les mêmes que les unités des flux, xn. Les constantes cn n'ont pas de dimension.

Avec ces conventions, cn et k sont positives pour une contrainte type telle que: "la somme pondérée de production doit être inférieure à la limite". En outre, les cn sont toutes égales à 1.0 pour un scénario tel que "le flux de l'interface doit être inférieur à la limite", en partant du principe que les bornes sont choisies sur le côté importation de l'interface.

Le Tableau 209 présente tous les attributs de SecurityConstraintSum.

Tableau 209 – Attributs de ExternalInputs::SecurityConstraintSum

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 210 présente toutes les extrémités d'association de SecurityConstraintSum avec d'autres classes.

Tableau 210 – Extrémités d'association de ExternalInputs::SecurityConstraintSum avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	ConstraintTerms	0..*	ConstraintTerm	
0..*	RTO	0..1	RTO	
1..1	BaseCaseConstraintLimit	0..1	BaseCaseConstraintLimit	
1..1	ContingencyConstraintLimits	0..*	ContingencyConstraintLimit	
1..1	DefaultConstraintLimit	0..1	DefaultConstraintLimit	

mult à partir de	nom	mult vers	type	description
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.42 SecurityConstraints

Ces contraintes sont typiques pour les gestionnaires des réseaux de transport régionaux (RTO). Elles incluent des contraintes de transport et de groupe de production identifiées dans le scénario de base et dans les scénarios de contingence critique.

Le Tableau 211 présente tous les attributs de SecurityConstraints.

Tableau 211 – Attributs de ExternalInputs::SecurityConstraints

nom	mult	type	description
minMW	0..1	ActivePower	Limite minimale en MW (uniquement pour les contraintes de transport).
maxMW	0..1	ActivePower	Limite maximale en MW
actualMW	0..1	ActivePower	Flux d'une branche réelle ou d'un groupe de branches en MW (uniquement pour les contraintes de transport)
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 212 présente toutes les extrémités d'association de SecurityConstraints avec d'autres classes.

Tableau 212 – Extrémités d'association de ExternalInputs::SecurityConstraints avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RTO	0..1	RTO	
0..*	GeneratingBid	0..1	GeneratingBid	
0..1	Flowgate	0..1	Flowgate	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.43 ServicePoint

Points terminaux définis d'un trajet de transmission. Les points de service sont définis du point de vue du service de transport. Chaque point de service est contenu dans (ou à la limite de) la zone d'échange. Un point de service est la source ou la destination d'une transaction.

Le Tableau 213 présente tous les attributs de ServicePoint.

Tableau 213 – Attributs de ExternalInputs::ServicePoint

nom	mult	type	description
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 214 présente toutes les extrémités d'association de ServicePoint avec d'autres classes.

Tableau 214 – Extrémités d'association de ExternalInputs::ServicePoint avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	PORTransmissionPath	0..*	TransmissionPath	Un trajet de transmission a un point de service appelé "point de réception"
1..1	PODTransmissionPath	0..*	TransmissionPath	Un trajet de transmission a un point de service "point de livraison"
0..1	SourceReservation	0..*	TransmissionReservation	
0..1	SinkReservation	0..*	TransmissionReservation	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.44 Classe racine ShuntCompensatorDynamicData

Optimal Power Flow (calcul de répartition optimal) ou State Estimator Filter Bank Data (données relatives au banc de filtres de l'estimateur d'état) pour le simulateur de formation des exploitants (OTS – Operator Training Simulator). Utilisée pour les utilisateurs RealTime, Study et Maintenance.

Le Tableau 215 présente tous les attributs de ShuntCompensatorDynamicData.

Tableau 215 – Attributs de ExternalInputs::ShuntCompensatorDynamicData

nom	mult	type	description
mVARInjection	0..1	Float	Injection de puissance réactive du banc de filtres dans la solution NA ou production de puissance réactive VCS
connectionStatus	0..1	Integer	Statut courant du condensateur de régulation de tension 1 = Connecté 0 = Déconnecté
desiredVoltage	0..1	Float	Tension souhaitée du condensateur de régulation de tension
voltageRegulationStatus	0..1	Boolean	Indicateur spécifiant si la régulation de tension agit en tant que régulateur; True = Oui, False = Non
stepPosition	0..1	Integer	Position d'un pas de condensateur de régulation de tension

Le Tableau 216 présente toutes les extrémités d'association de ShuntCompensatorDynamicData avec d'autres classes.

Tableau 216 – Extrémités d'association de ExternalInputs::ShuntCompensatorDynamicData avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktShuntCompensator	1..1	MktShuntCompensator	

6.5.6.2.45 Classe racine SwitchStatus

Optimal Power Flow (calcul de répartition optimal) ou State Estimator Circuit Breaker Status (statut du disjoncteur de l'estimateur d'état).

Le Tableau 217 présente tous les attributs de SwitchStatus.

Tableau 217 – Attributs de ExternalInputs::SwitchStatus

nom	mult	type	description
switchStatus	0..1	SwitchStatusType	Statut du disjoncteur (fermé ou ouvert) du flux de puissance (<i>power flow</i>).

Le Tableau 218 présente toutes les extrémités d'association de SwitchStatus avec d'autres classes.

Tableau 218 – Extrémités d'association de ExternalInputs::SwitchStatus avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktSwitch	1..1	MktSwitch	

6.5.6.2.46 Classe racine SysLoadDistributionFactor

Cette classe modélise les facteurs de distribution du système. Elle nécessite d'être utilisée avec HostControlArea et ConnectivityNode pour indiquer la distribution de chaque partie individuelle.

Le Tableau 219 présente tous les attributs de SysLoadDistributionFactor.

Tableau 219 – Attributs de ExternalInputs::SysLoadDistributionFactor

nom	mult	type	description
factor	0..1	Float	Utilisé pour calculer la "participation" de charge d'un nœud de connectivité dans une zone de régulation hôte

Le Tableau 220 présente toutes les extrémités d'association de SysLoadDistributionFactor avec d'autres classes.

Tableau 220 – Extrémités d'association de ExternalInputs::SysLoadDistributionFactor avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	MktConnectivityNode	1..1	MktConnectivityNode	
0..*	DistributionFactorSet	0..*	DistributionFactorSet	
0..*	HostControlArea	1..1	HostControlArea	

6.5.6.2.47 Classe racine TREntitlement

Un Transmission Right (TR) (droit de transport) peut être une chaîne de TR ou un TR individuel.

Lorsqu'un droit de transport n'est pas une chaîne, il est officiellement le droit ETC/TOR de chaque contrat ETC/TOR avec CVR (Converted Rights – droits convertis) comme ETC. Il s'agit de la somme de tous les droits sur toutes les interfaces de transport liées pour un même TR.

Lorsque TR est une chaîne, son droit est le minimum de tous les droits pour les TR individuels de la chaîne.

Le Tableau 221 présente tous les attributs de TREntitlement.

Tableau 221 – Attributs de ExternalInputs::TREntitlement

nom	mult	type	description
entitlement	0..1	Float	Le droit
startOperatingDate	0..1	DateTime	Date et heure d'exploitation lorsque le droit s'applique

Le Tableau 222 présente toutes les extrémités d'association de TREntitlement avec d'autres classes.

Tableau 222 – Extrémités d'association de ExternalInputs::TREntitlement avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	TransmissionContractRight	1..1	ContractRight	

6.5.6.2.48 Classe racine TapChangerDynamicData

Optimal Power Flow (calcul de répartition optimal) ou State Estimator Phase Shifter Data (données relatives au déphaseur de l'estimateur d'état). Utilisée pour les utilisateurs RealTime, Study et Maintenance. Mesures du déphaseur de solution SE du dernier processus de SE

Le Tableau 223 présente tous les attributs de TapChangerDynamicData.

Tableau 223 – Attributs de ExternalInputs::TapChangerDynamicData

nom	mult	type	description
tapPosition	0..1	Float	Position de la prise du déphaseur, position supérieure de la prise du transformateur ou position inférieure de la prise du transformateur
desiredVoltage	0..1	Float	Tension souhaitée du LTC (changeur de prise en charge)
voltageRegulationStatus	0..1	Boolean	Indicateur spécifiant si le transformateur LTC agit en tant que régulateur; True = Oui, False = Non
angleRegulationStatus	0..1	Boolean	True signifie que le déphaseur régule.
desiredMW	0..1	Float	Quantité de MW souhaitée pour le déphaseur. Point de consigne de régulation de la puissance active du déphaseur
solvedAngle	0..1	Float	Angle du déphaseur. Déphasage angulaire résolu du déphaseur
minimumAngle	0..1	Float	Déphasage angulaire minimal du déphaseur
maximumAngle	0..1	Float	Déphasage angulaire maximal du déphaseur

Le Tableau 224 présente toutes les extrémités d'association de TapChangerDynamicData avec d'autres classes.

Tableau 224 – Extrémités d'association de ExternalInputs::TapChangerDynamicData avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktTapChanger	1..1	MktTapChanger	

6.5.6.2.49 TerminalConstraintTerm

Une condition de contrainte associée à une borne spécifique sur un équipement physique.

Le Tableau 225 présente tous les attributs de TerminalConstraintTerm.

Tableau 225 – Attributs de ExternalInputs::TerminalConstraintTerm

nom	mult	type	description
factor	0..1	String	Hérité de: ConstraintTerm
function	0..1	String	Hérité de: ConstraintTerm
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 226 présente toutes les extrémités d'association de TerminalConstraintTerm avec d'autres classes.

Tableau 226 – Extrémités d'association de ExternalInputs::TerminalConstraintTerm avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktTerminal	1..1	MktTerminal	
0..*	SecurityConstraintSum	1..1	SecurityConstraintSum	Hérité de: ConstraintTerm
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.50 TransferInterface

Une interface de transfert est composée de branches telles que les lignes de transmission et les transformateurs.

Le Tableau 227 présente tous les attributs de TransferInterface.

Tableau 227 – Attributs de ExternalInputs::TransferInterface

nom	mult	type	description
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 228 présente toutes les extrémités d'association de TransferInterface avec d'autres classes.

Tableau 228 – Extrémités d'association de ExternalInputs::TransferInterface avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	TransferInterfaceSolution	1..1	TransferInterfaceSolution	
0..*	HostControlArea	0..1	HostControlArea	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.51 Classe racine TransferInterfaceSolution

Définitions d'interface TNA de OPF pour VSA

Le Tableau 229 présente tous les attributs de TransferInterfaceSolution.

Tableau 229 – Attributs de ExternalInputs::TransferInterfaceSolution

nom	mult	type	description
interfaceMargin	0..1	Float	Marge de l'interface
transferLimit	0..1	Float	Interface de transfert + Limite Utilisation de l'attribut: Valeur absolue du flux maximum sur l'interface de transfert. Il s'agit d'une valeur positive en MW.
postTransferMW	0..1	Float	MW post-transfert pour une étape

Le Tableau 230 présente toutes les extrémités d'association de TransferInterfaceSolution avec d'autres classes.

Tableau 230 – Extrémités d'association de ExternalInputs::TransferInterfaceSolution avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	TransferInterface	1..1	TransferInterface	
0..1	MktContingencyA	0..1	MktContingency	
0..1	MktContingencyB	0..1	MktContingency	

6.5.6.2.52 Classe racine TransmissionCapacity

Cette classe modélise la capacité de transport (une interface de transport ou une paire POR/POD) comprenant la capacité de transfert totale (TTC – Total Transfer Capacity), la capacité de transfert opérationnelle (OTC – Operating Transfer Capacity) et la marge bénéficiaire de capacité (CBM – Capacity Benefit Margin).

Le Tableau 231 présente tous les attributs de TransmissionCapacity.

Tableau 231 – Attributs de ExternalInputs::TransmissionCapacity

nom	mult	type	description
capacityBenefitMargin	0..1	Float	La marge bénéficiaire de capacité (CBM) est utilisée par les marchés (<i>Markets</i>) pour calculer les limites de l'interface de transport. Ce nombre peut être déterminé manuellement ou selon une procédure. La CBM est définie par interface de transport (groupe de branches).
operationalTransmissionCapacity	0..1	Float	La capacité de transport opérationnelle (OTC) est la capacité de transport dans les conditions opérationnelles pendant une période de temps déterminée, comprenant les effets de réduction et les paramètres actuels de contrôle des opérations. Les OTC des interfaces de transport (groupe de branches) sont toujours fournies quelles que soient les conditions d'indisponibilité ou de commutation.
OTC15min_emergency	0..1	Float	Le seuil d'urgence de 15 min de la capacité de transport opérationnelle (OTC)
OTCemergency	0..1	Float	Le seuil d'urgence de la capacité de transport opérationnelle (OTC).
POD	0..1	String	Point de livraison
POR	0..1	String	Point de réception
startOperatingDate	0..1	DateTime	Date et heure d'exploitation lorsque le droit s'applique
totalTransmissionCapacity	0..1	Float	Capacité de transport totale

Le Tableau 232 présente toutes les extrémités d'association de TransmissionCapacity avec d'autres classes.

Tableau 232 – Extrémités d'association de ExternalInputs::TransmissionCapacity avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	GenericConstraints	0..1	GenericConstraints	
0..*	Flowgate	0..1	Flowgate	

6.5.6.2.53 Classe racine TransmissionInterfaceRightEntitlement

Elle est officiellement appelée le droit ETC/TOR du groupe de branches avec CVP en tant que ETC. Elle peut également être utilisée pour représenter le droit TR d'un POR/POD.

Le Tableau 233 présente tous les attributs de TransmissionInterfaceRightEntitlement.

Tableau 233 – Attributs de ExternalInputs::TransmissionInterfaceRightEntitlement

nom	mult	type	description
entitlement	0..1	Float	Droit
POD	0..1	String	Point de livraison
POR	0..1	String	Point de réception
startOperatingDate	0..1	DateTime	Date et heure d'exploitation lorsque le droit s'applique

Le Tableau 234 présente toutes les extrémités d'association de TransmissionInterfaceRightEntitlement avec d'autres classes.

Tableau 234 – Extrémités d'association de ExternalInputs::TransmissionInterfaceRightEntitlement avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	ContractRight	1..1	ContractRight	
0..*	Flowgate	0..1	Flowgate	

6.5.6.2.54 TransmissionPath

Une connexion, un lien ou une ligne électrique composé(e) d'un ou de plusieurs éléments de transport parallèles entre deux zones des systèmes électriques interconnectés ou d'une partie d'entre eux. TransmissionCorridor et TransmissionRightOfWay font partie des aspects juridiques. TransmissionPath fait référence aux segments entre les ServicePoints d'un TransmissionProvider.

Le Tableau 235 présente tous les attributs de TransmissionPath.

Tableau 235 – Attributs de ExternalInputs::TransmissionPath

nom	mult	type	description
availTransferCapability	0..1	ActivePower	Capacité de transport disponible d'un trajet de transmission pour la direction de référence.
parallelPathFlag	0..1	Boolean	Indicateur précisant si le trajet de transmission est également une "voie parallèle" d'interconnexion désignée.
totalTransferCapability	0..1	ActivePower	La capacité de transport totale d'un trajet de transmission dans la direction de référence.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 236 présente toutes les extrémités d'association de TransmissionPath avec d'autres classes.

Tableau 236 – Extrémités d'association de ExternalInputs::TransmissionPath avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	TransmissionReservation	0..*	TransmissionReservation	
0..*	PointOfReceipt	1..1	ServicePoint	Un trajet de transmission a un point de service appelé "point de réception"
0..*	DeliveryPoint	1..1	ServicePoint	Un trajet de transmission a un point de service "point de livraison"
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.2.55 Classe racine TransmissionReservation

Une réservation de transport est obtenue du système OASIS pour réserver le transport pour une période de temps, un trajet de transmission et un produit de transport donnés.

Le Tableau 237 présente toutes les extrémités d'association de TransmissionReservation avec d'autres classes.

Tableau 237 – Extrémités d'association de ExternalInputs::TransmissionReservation avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	EnergyTransaction	0..1	EnergyTransaction	
0..1	TransactionBid	0..1	TransactionBid	
0..*	Source	0..1	ServicePoint	
0..*	Sink	0..1	ServicePoint	
0..*	TransmissionPath	1..1	TransmissionPath	

6.5.6.2.56 UnitInitialConditions

Statut de ressource à la fin d'une période d'équilibre donnée.

Le Tableau 238 présente tous les attributs de UnitInitialConditions.

Tableau 238 – Attributs de ExternalInputs::UnitInitialConditions

nom	mult	type	description
cumEnergy	0..1	RealEnergy	Production d'énergie cumulée sur une période d'échange.
cumStatusChanges	0..1	Integer	Nombre cumulé de changements de statut de la ressource.
numberOfStartups	0..1	Integer	Nombre de démarrages par jour d'exploitation (Operating Day) jusqu'à la fin de l'heure précédente.
onlineStatus	0..1	Boolean	"True" si le GeneratingUnit est actuellement en ligne.
resourceMW	0..1	ActivePower	Sortie en MW de ressource à la fin de la période d'équilibre précédente.
resourceStatus	0..1	Integer	Statut de ressource à la fin de la période d'équilibre précédente: 0 – hors ligne 1 – production en ligne 2 – en cours d'arrêt 3 – en cours de démarrage
statusDate	0..1	DateTime	Heure et date de resourceStatus
timeInStatus	0..1	Float	Heure dans les intervalles d'échange de marché à laquelle la ressource revêt un statut à la fin de la période d'équilibre précédente.
timeInterval	0..1	DateTime	Intervalle de temps
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 239 présente toutes les extrémités d'association de UnitInitialConditions avec d'autres classes.

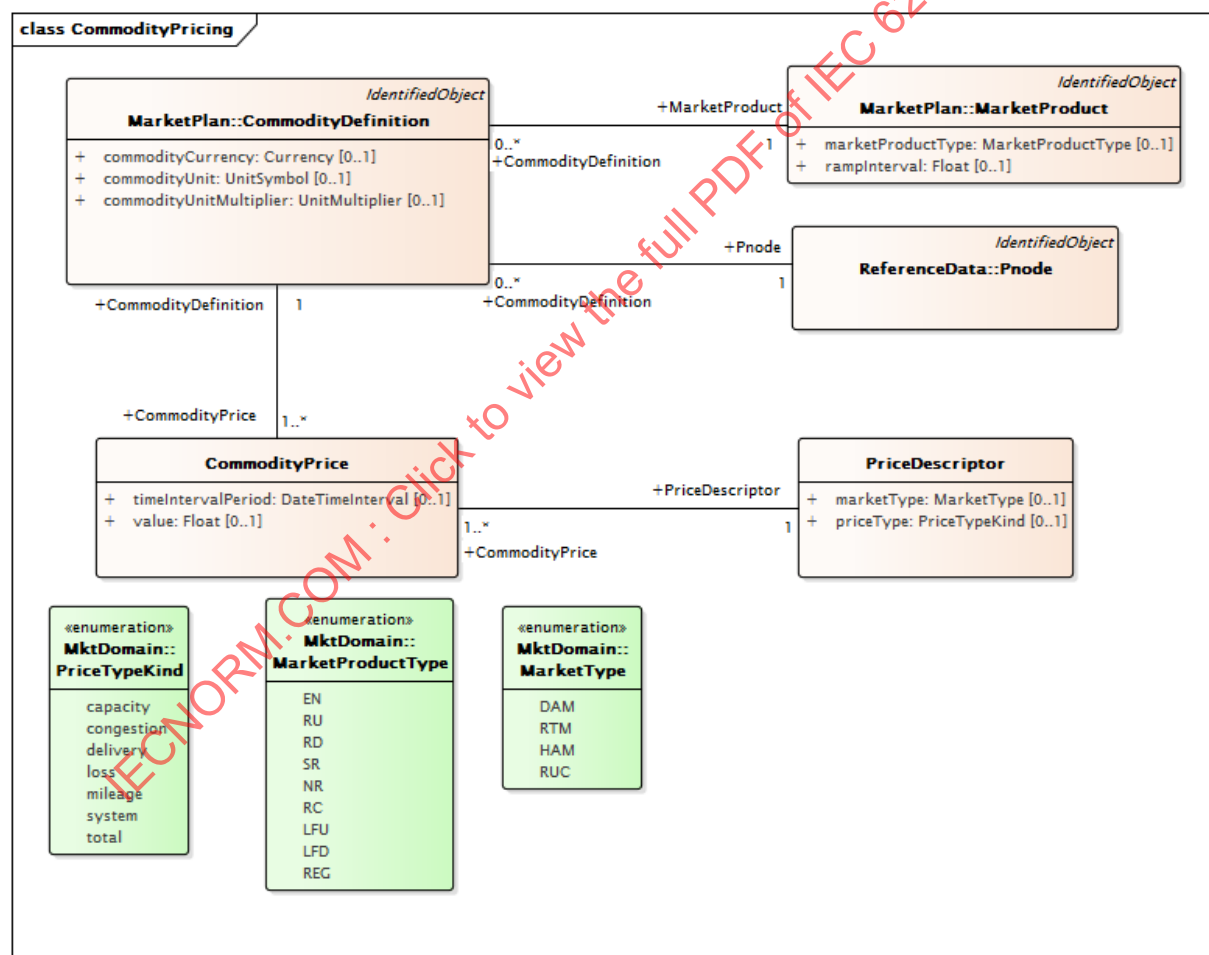
Tableau 239 – Extrémités d'association de ExternalInputs::UnitInitialConditions avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	GeneratingUnit	0..1	RegisteredGenerator	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3 Paquetage MarketResults

6.5.6.3.1 Généralités

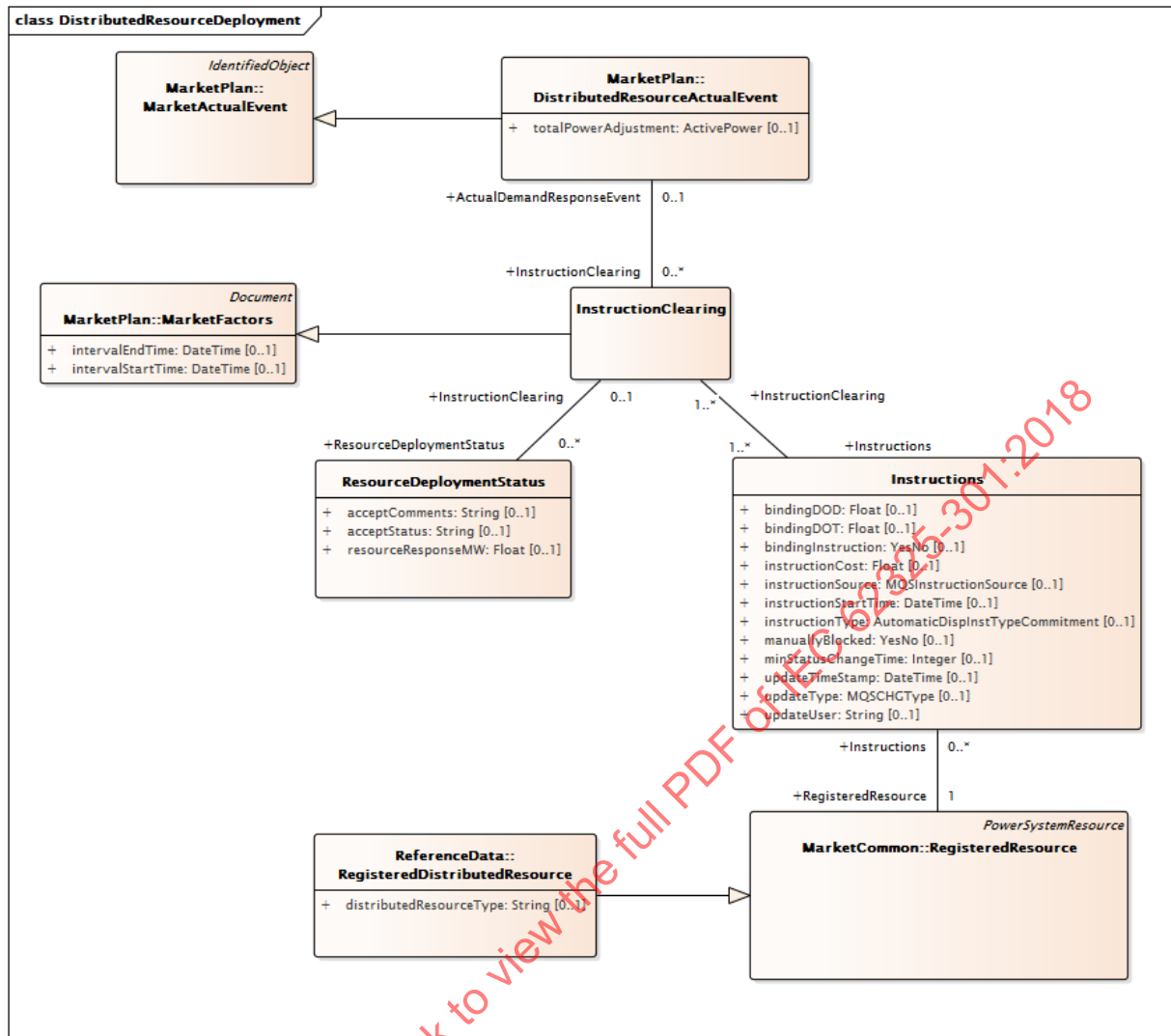
Résultats de l'exécution d'un marché.



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Figure 44 – Diagramme de classe MarketResults::CommodityPricing

Figure 44: représente la manière dont les CommodityDefinitions sont définies pour un produit du marché à un nœud de tarification. Les CommodityPrices pour des intervalles de temps spécifiques peuvent être définis pour une CommodityDefinition. Chaque CommodityPrice a un PriceDescriptor qui spécifie le type de marché et le type de tarification.



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Figure 45 – Diagramme de classe MarketResults::DistributedResourceDeployment

Figure 45: représente les classes impliquées dans le déploiement d'une ressource répartie enregistrée. Les déploiements pilotés par des événements sont définis par la classe DistributedResourceActualEvent qui hérite de la classe MarketActualEvent. Des instructions comprenant la cible d'exploitation de répartition par obligation ou le delta de répartition d'exploitation par obligation avec l'heure de démarrage et le type d'instruction sont envoyées aux RegisteredDistributedResources. Les déploiements qui sont spécifiques aux ressources, pilotés par des événements ou en vrac sont tous pris en charge par ces classes.

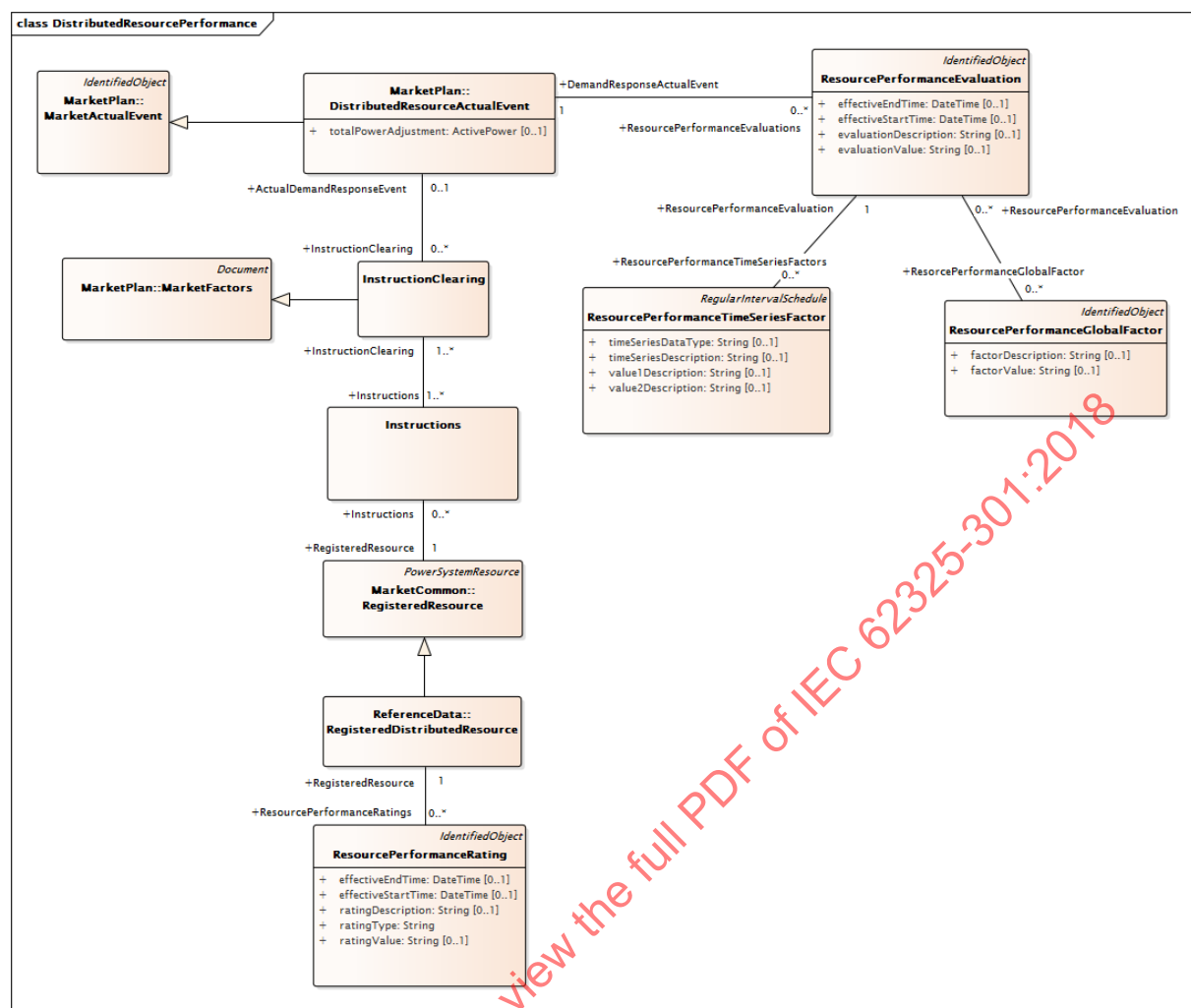


Figure 46 – Diagramme de classe MarketResults::DistributedResourcePerformance

Figure 46: représente la prise en charge de l'évaluation des performances pour les RegisteredDistributedResources. Après réception de l'évaluation de la qualité des revenus, une instance ResourcePerformanceEvaluation peut être créée pour chaque ressource par événement DR.

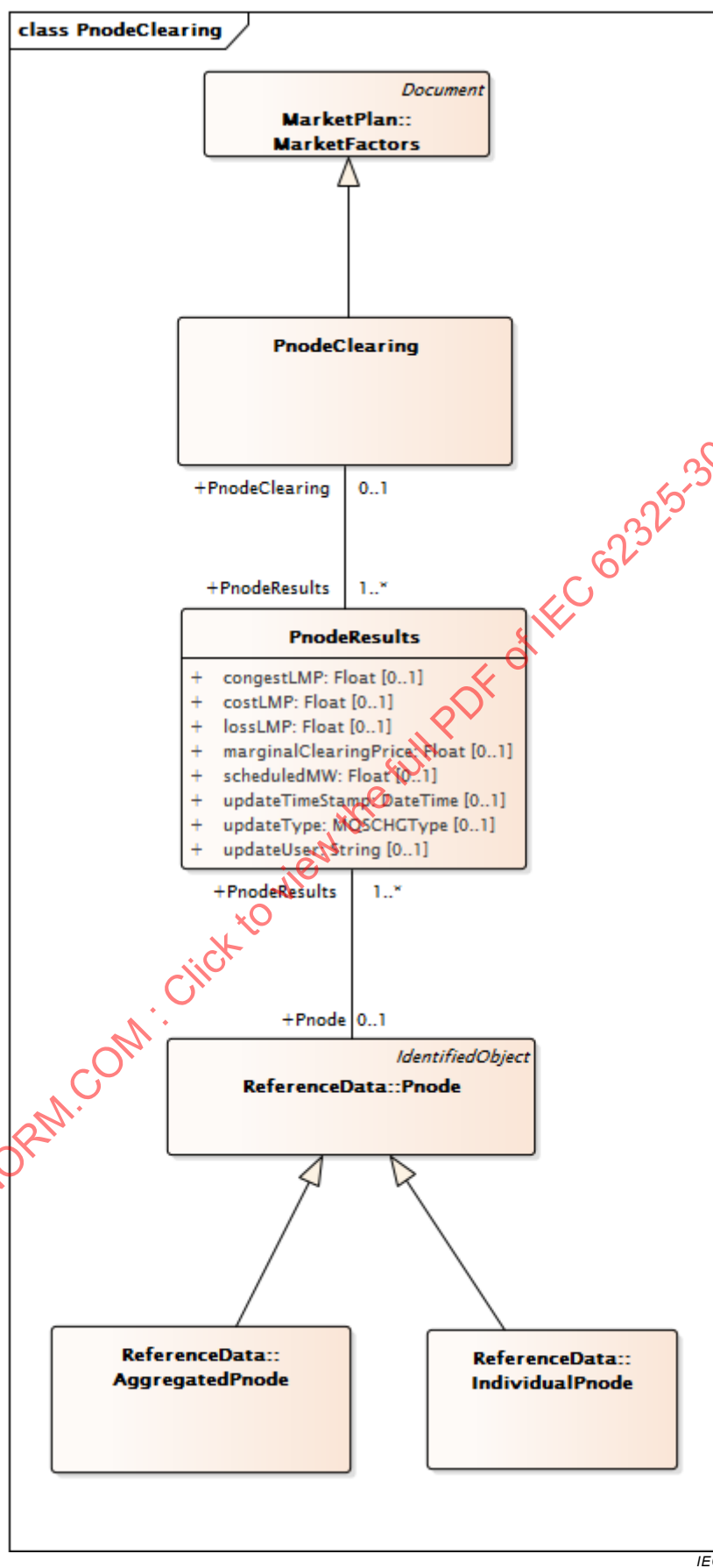
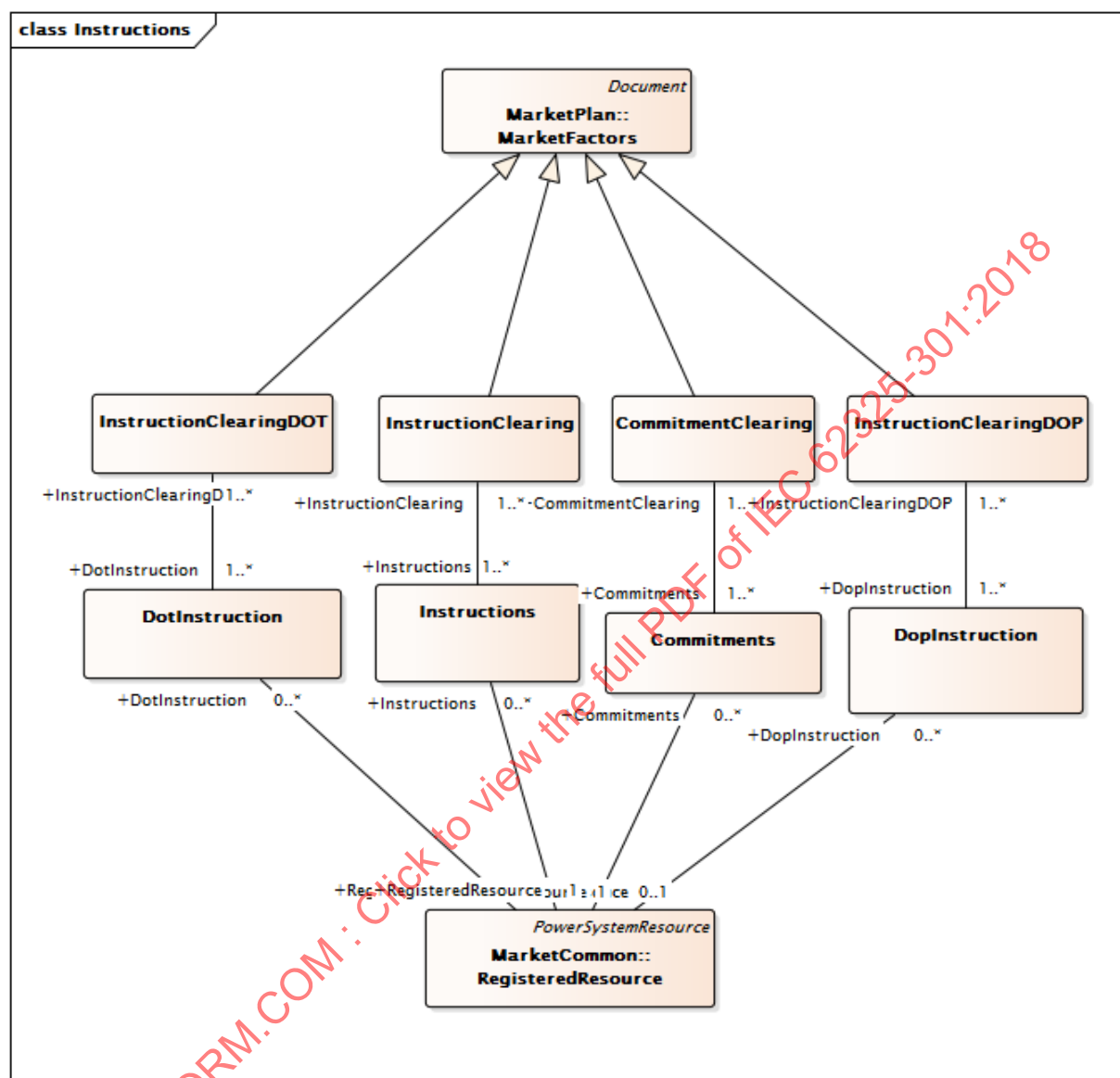


Figure 47 – Diagramme de classe MarketResults::PnodeClearing

Figure 47: représente les classes et les relations utilisées pour modéliser les résultats du marché nodal pour chaque Pnode par intervalle de temps. Les intervalles sont définis par PnodeClearing qui hérite de MarketFactors. Les PnodeResults comprennent les résultats pour chaque Pnode.



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Figure 48 – Diagramme de classe MarketResults::Instructions

Figure 48: représente les classes utilisées pour modéliser les instructions envoyées aux participants du marché après la mise en équilibre du marché. Les principales classes et leurs relations incluent la classe RegisteredResource qui modélise la ressource participante, ainsi que les classes Commitment et CommitmentClearing qui modélisent les résultats qui demandent l'engagement de la ressource. DotInstruction et DopInstruction autorisent la modélisation des résultats d'une répartition dynamique (ou anticipée) qui peut être utilisée dans le marché en temps réel.

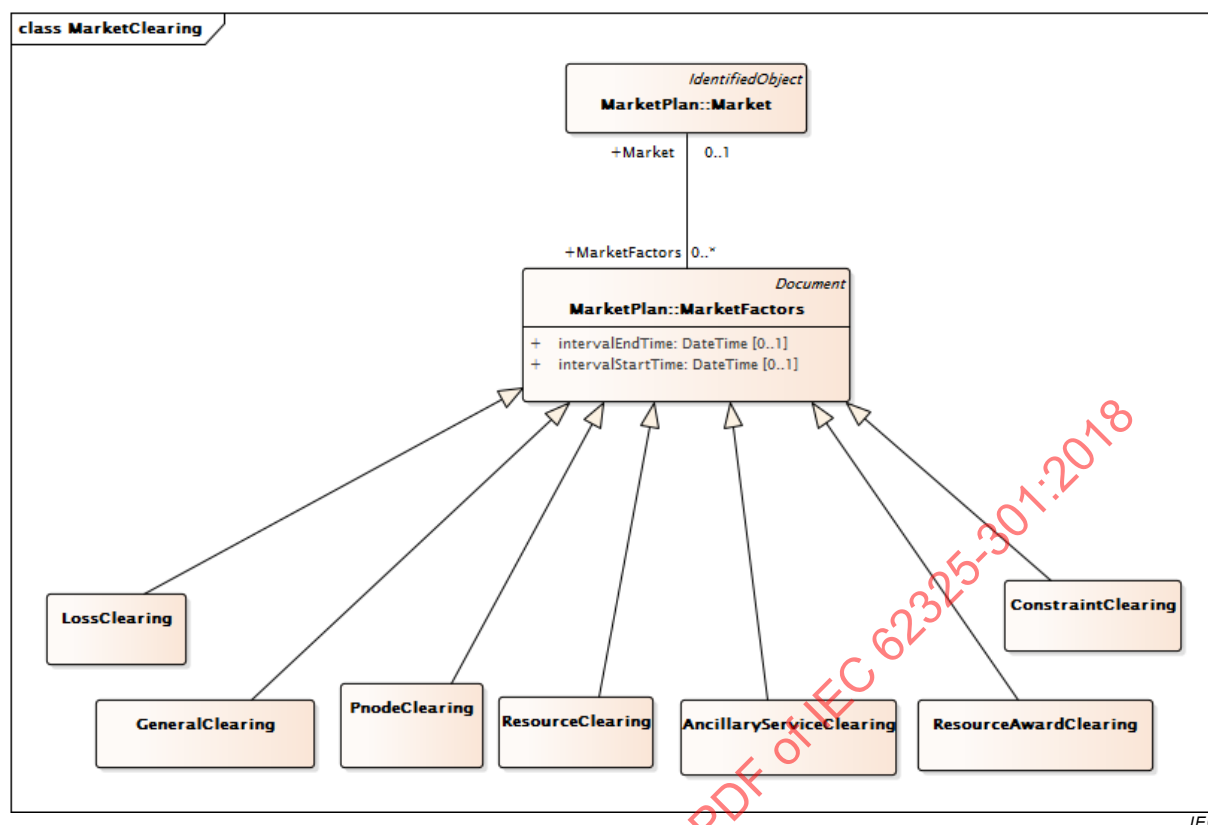


Figure 49 – Diagramme de classe MarketResults::MarketClearing

Figure 49: Chaque classe d'équilibre du marché définie hérite de la classe MarketFactors pour définir les intervalles de temps et le type d'exécution du marché.

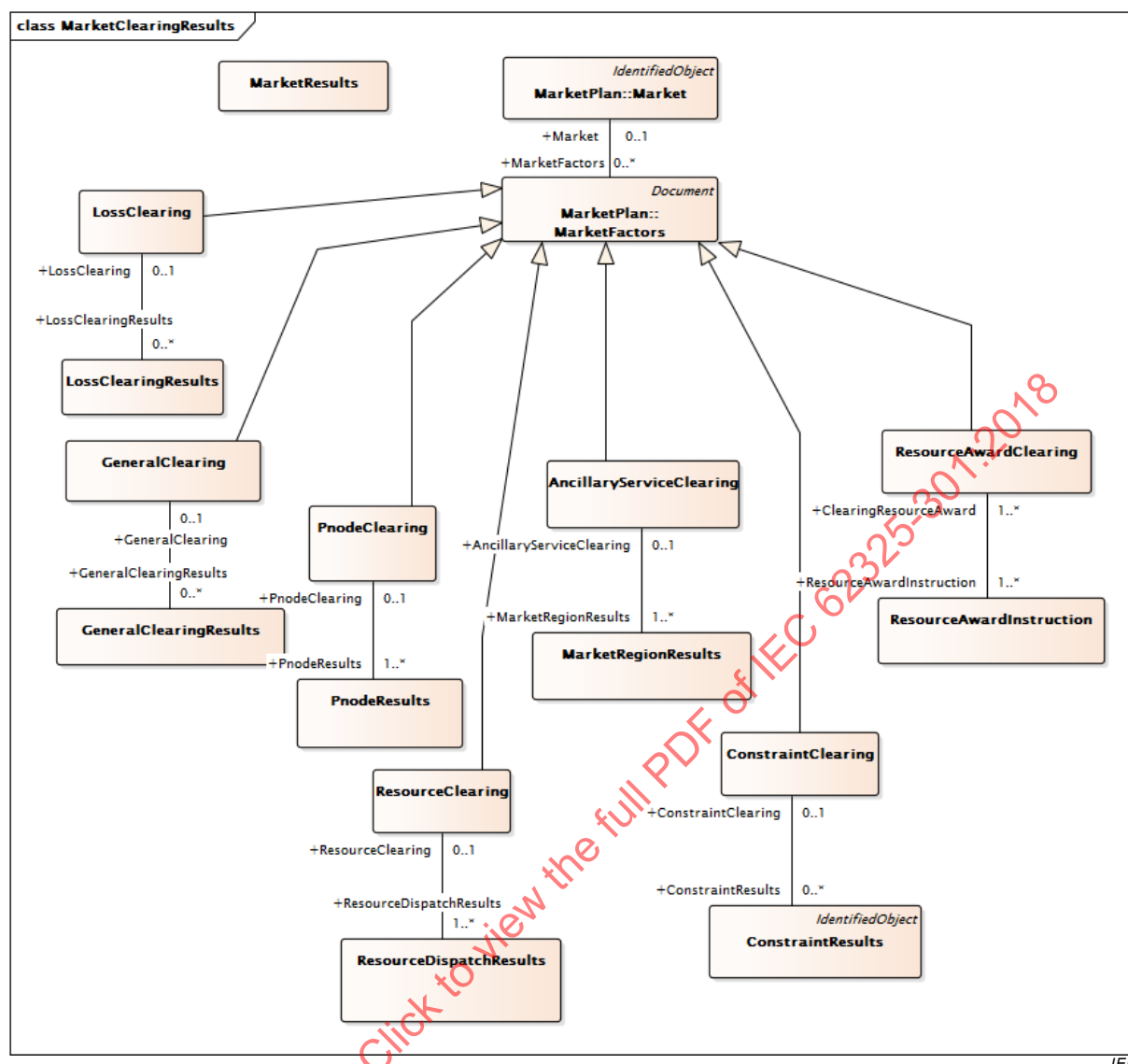
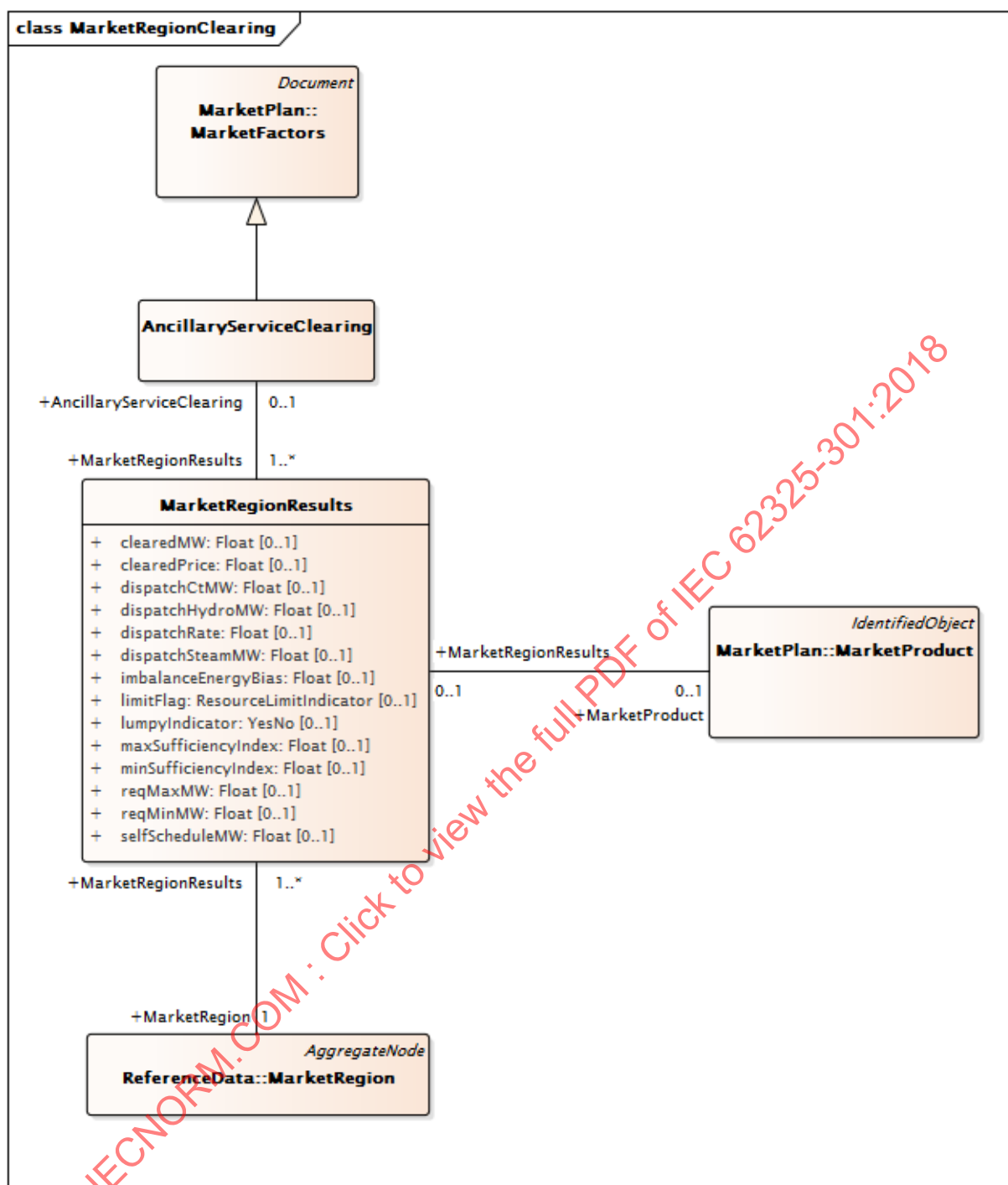


Figure 50 – Diagramme de classe MarketResults::MarketClearingResults

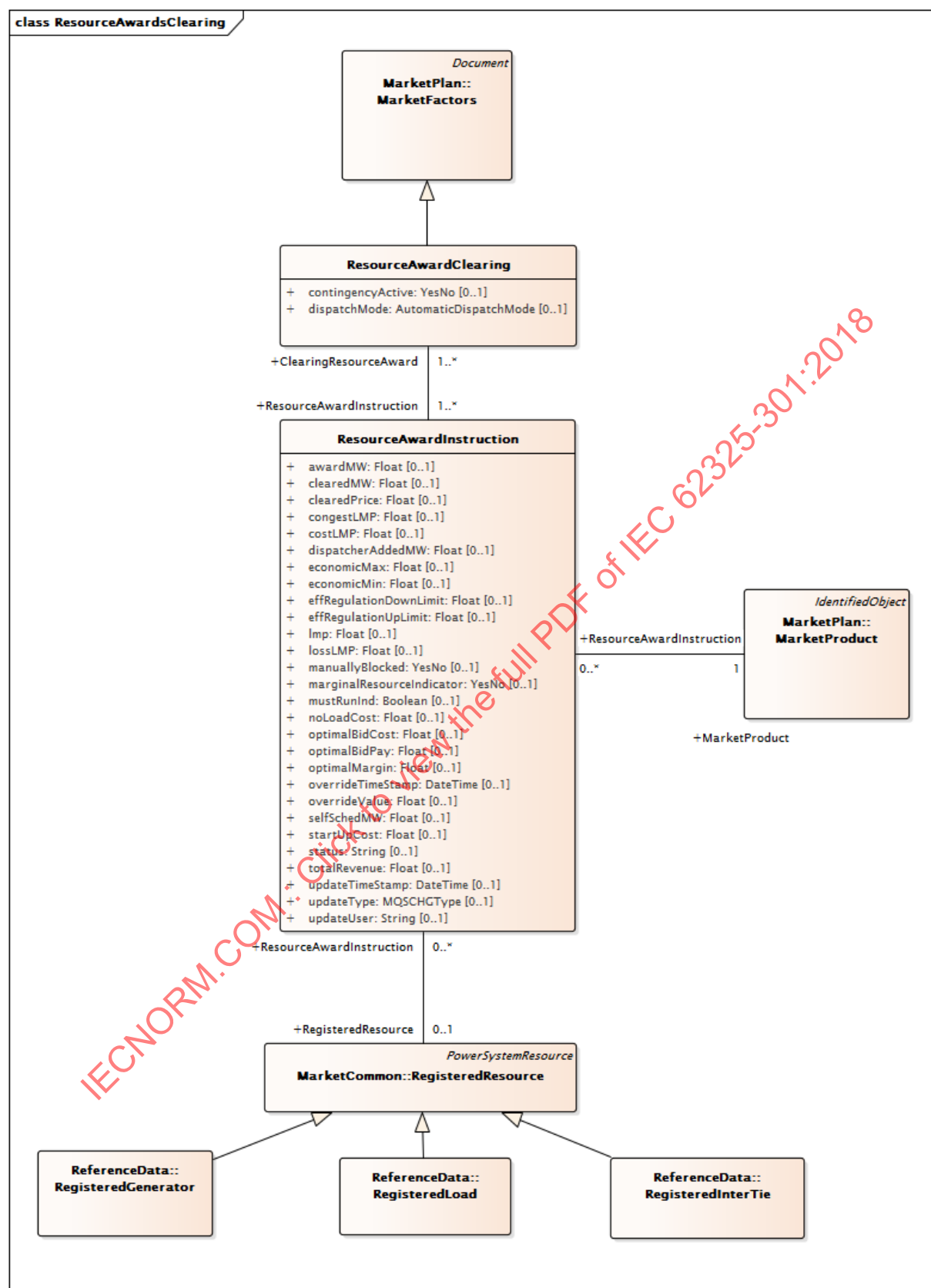
Figure 50: représente les classes et les relations utilisées pour modéliser les résultats de l'équilibre du marché de manière générale. La classe MarketResults résume le processus de marché. La classe LossClearingResults récapitule les pertes. GeneralClearingResults est utilisé pour modéliser la charge d'équilibre sur une base de zone de charge. Les classes PnodeClearing et PnodeClearingResults sont utilisées pour modéliser les prix marginaux locaux (LMP) au niveau des nœuds de tarification individuels. Les classes ResourceClearing et ResourceDispatchInstruction comprennent les instructions de répartition et l'indicateur d'une répartition dans un cas normal ou dans un cas de contingence. La classe AncillaryServiceClearing comprend des informations sur les services auxiliaires. La classe ConstraintResults comprend des contraintes de liaison et leurs coûts fictifs associés. ResourceAwardInstruction inclut des attributions de puissance active et des informations LMP.



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Figure 51 – Diagramme de classe MarketResults::MarketRegionClearing

Figure 51: représente les classes et les relations utilisées pour modéliser les résultats de l'équilibre du marché des services auxiliaires au niveau d'une région du marché. Le modèle inclut les résultats au niveau des produits de services auxiliaires spécifiques grâce à la classe MarketProduct et à l'association à MarketRegionResults.



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Figure 52: représente les classes et les relations utilisées pour modéliser les résultats de l'équilibre du marché en mettant l'accent sur ResourceAwardInstruction. La classe principale de ce diagramme est ResourceAwardInstruction, qui modélise les détails de l'attribution à la ressource comprenant la puissance active, le prix marginal local (LMP) et ses composants

d'énergie, de congestion et de coût. Le modèle de ressource inclut les sous-classes RegisteredGenerator, RegisteredLoad et RegisteredInterTie.

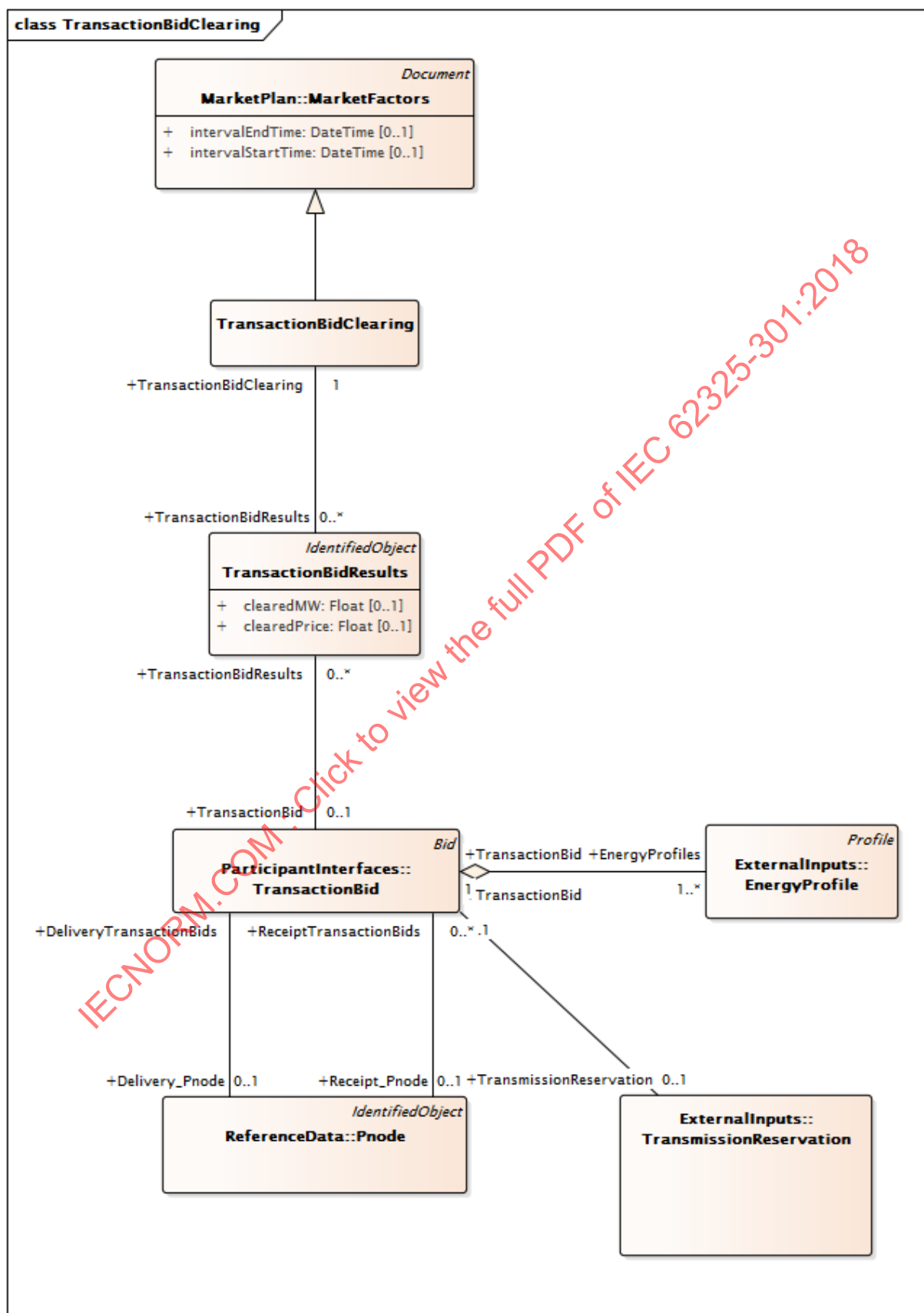


Figure 53 – Diagramme de classe MarketResults::TransactionBidClearing

Figure 53: représente les classes et les relations utilisées pour modéliser les résultats de l'équilibre du marché en mettant l'accent sur les résultats de transaction. Ce modèle inclut la classe TransactionBid et ses relations avec les Pnodes Point of Delivery (point de livraison) et Point of Receipt (point de réception).

6.5.6.3.2 AncillaryServiceClearing

Modélise les résultats de l'équilibre du marché par rapport aux produits des services auxiliaires

Le Tableau 240 présente tous les attributs de AncillaryServiceClearing.

Tableau 240 – Attributs de MarketResults::AncillaryServiceClearing

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 241 présente toutes les extrémités d'association de AncillaryServiceClearing avec d'autres classes

Tableau 241 – Extrémités d'association de MarketResults::AncillaryServiceClearing avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	MarketRegionResults	1..*	MarketRegionResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject

mult à partir de	nom	mult vers	type	description
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.3 BillDeterminant

Modélise différents frais pour prendre en charge la facturation et le règlement

Le Tableau 242 présente tous les attributs de BillDeterminant.

Tableau 242 – Attributs de MarketResults::BillDeterminant

nom	mult	type	description
calculationLevel	0..1	String	Niveau de l'ordre de calcul des frais.
configVersion	0..1	String	Version de configuration de la logique de calcul pour le règlement.
deleteStatus	0..1	String	
effectiveDate	0..1	DateTime	
exception	0..1	String	
factor	0..1	String	
frequency	0..1	String	
numberInterval	0..1	Integer	Nombre d'intervalles de l'élément déterminant de facturation le jour de l'opération, par exemple: 300 pour des intervalles de cinq minutes.
offset	0..1	String	
precisionLevel	0..1	String	Niveau de précision de la valeur actuelle.
primaryYN	0..1	String	
referenceFlag	0..1	String	
reportable	0..1	String	
roundOff	0..1	String	
source	0..1	String	
terminationDate	0..1	DateTime	
unitOfMeasure	0..1	String	Unité de mesure de la valeur actuelle de l'élément déterminant de facturation.
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 243 présente toutes les extrémités d'association de BillDeterminant avec d'autres classes.

Tableau 243 – Extrémités d'association de MarketResults::BillDeterminant avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktUserAttribute	0..*	MktUserAttribute	
0..1	ChargeProfileData	0..*	ChargeProfileData	
0..*	ChargeComponents	0..*	ChargeComponent	Un BillDeterminant peut avoir 0-n ChargeComponent et un ChargeComponent peut être associé à 0-n BillDeterminant.
0..1	ChargeProfile	0..1	ChargeProfile	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.4 ChargeProfile

Type de profil pour les charges financières

Le Tableau 244 présente tous les attributs de ChargeProfile.

Tableau 244 – Attributs de MarketResults::ChargeProfile

nom	mult	type	description
type	0..1	String	Type de profil. Peut être le montant, le prix ou la quantité.
frequency	0..1	String	Fréquence de calcul: quotidienne ou mensuelle.
numberInterval	0..1	Integer	Nombre d'intervalles des données de profil.
unitOfMeasure	0..1	String	Unité de mesure appliquée à l'attribut de valeur des données de profil.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 245 présente toutes les extrémités d'association de ChargeProfile avec d'autres classes.

Tableau 245 – Extrémités d'association de MarketResults::ChargeProfile avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	BillDeterminant	0..1	BillDeterminant	
0..1	ChargeProfileData	0..*	ChargeProfileData	
0..*	PassTroughBill	0..1	PassThroughBill	
0..*	Bid	0..1	Bid	
0..*	ProfileDatas	0..*	ProfileData	Hérité de: Profile
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.5 Classe racine ChargeProfileData

Modèle de différents frais associés à un profil d'énergie pour prendre en charge la facturation et le règlement

Le Tableau 246 présente tous les attributs de ChargeProfileData.

Tableau 246 – Attributs de MarketResults::ChargeProfileData

nom	mult	type	description
sequence	0..1	Integer	Numéro de séquence du profil.
timeStamp	0..1	DateTime	Date et heure d'un intervalle.
value	0..1	Float	Valeur d'un intervalle selon un type de profil donné (montant, prix ou quantité), en fonction de l'unité de mesure.

Le Tableau 247 présente toutes les extrémités d'association de ChargeProfileData avec d'autres classes.

Tableau 247 – extrémités d'association de MarketResults::ChargeProfileData avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	BillDeterminant	0..1	BillDeterminant	
0..*	ChargeProfile	0..1	ChargeProfile	

6.5.6.3.6 CommitmentClearing

Modélise les résultats de l'équilibre du marché qui demandent l'engagement des unités.

Le Tableau 248 présente tous les attributs de CommitmentClearing.

Tableau 248 – Attributs de MarketResults::CommitmentClearing

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 249 présente toutes les extrémités d'association de CommitmentClearing avec d'autres classes.

Tableau 249 – Extrémités d'association de MarketResults::CommitmentClearing avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	Commitments	1..*	Commitments	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.7 Classe racine Commitments

Apporte les informations nécessaires (sur la base de ressources) pour la collecte des résultats d'engagement de Démarrage/Arrêt. Ces informations sont utiles pour tous les marchés.

Le Tableau 250 présente tous les attributs de Commitments.

Tableau 250 – Attributs de MarketResults::Commitments

nom	mult	type	description
commitmentType	0..1	CommitmentType	Type de statut UC (engagement volontaire, engagement ISO ou engagement SCUC)
instructionCost	0..1	Float	Coût total associé au changement du statut de la ressource.
instructionType	0..1	AutomaticDisplnstTypeCommitment	Indique s'il s'agit d'un démarrage ou d'un arrêt.
intervalEndTime	0..1	DateTime	Heure de fin de la période d'engagement. Ce sera sur une limite d'intervalle.
intervalStartTime	0..1	DateTime	Heure de début de la période d'engagement. Ce sera sur une limite d'intervalle.
minStatusChangeTime	0..1	Integer	Temps de démarrage de la période d'engagement SCUC. Temps de démarrage calculé en fonction de StartUpTimeCurve, fourni avec la Bid. Il s'agit d'une combinaison de l'offre du temps de démarrage et du temps d'indisponibilité de l'unité. Unités en minutes
noLoadCost	0..1	Float	Coût à charge nulle de l'unité en cas de marchandise énergétique
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
updateUser	0..1	String	

Le Tableau 251 présente toutes les extrémités d'association de Commitments avec d'autres classes.

Tableau 251 – Extrémités d'association de MarketResults::Commitments avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	1..1	RegisteredResource	
1..*	CommitmentClearing	1..*	CommitmentClearing	

6.5.6.3.8 Classe racine CommodityPrice

La classe CommodityPrice est utilisée afin de définir le prix d'une marchandise pendant un intervalle de temps donné. L'intervalle peut être long (par exemple, un an), ou très court (par exemple, 5 min). Il existe de nombreuses instances de la classe CommodityPrice pour chaque instance de la CommodityDefinition à laquelle elles sont associées. À noter qu'il peut y avoir plus d'un prix associé à un intervalle donné et que ces variances sont décrites par l'association (ou les associations) avec la classe PriceDescriptor.

Le Tableau 252 présente tous les attributs de CommodityPrice.

Tableau 252 – Attributs de MarketResults::CommodityPrice

nom	mult	type	description
timeIntervalPeriod	0..1	DateTimeInterval	Intervalle de temps pendant lequel CommodityPrice est valide, conformément aux conventions normalisées associées à la classe DateTimeInterval.
value	0..1	Float	Prix de la Commodity (marchandise), exprimé en valeur à virgule flottante. La devise et l'unité de mesure sont définies dans la classe CommodityDefinition associée.

Le Tableau 253 présente toutes les extrémités d'association de CommodityPrice avec d'autres classes.

Tableau 253 – Extrémités d'association de MarketResults::CommodityPrice avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	CommodityDefinition	1..1	CommodityDefinition	
1..*	PriceDescriptor	1..1	PriceDescriptor	
0..*	PnodeClearing	0..1	PnodeClearing	

6.5.6.3.9 ConstraintClearing

Regroupe tous les éléments associés aux contraintes avec obligation et aux violations de contraintes par intervalle et par marché.

Le Tableau 254 présente tous les attributs de ConstraintClearing.

Tableau 254 – Attributs de MarketResults::ConstraintClearing

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject

nom	mult	type	description
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 255 présente toutes les extrémités d'association de ConstraintClearing avec d'autres classes.

Tableau 255 – Extrémités d'association de MarketResults::ConstraintClearing avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	ConstraintResults	0..*	ConstraintResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.10 ConstraintResults

Fournit les résultats du marché sur le traitement des contraintes pour le DAM ou le RTM. Les données incluent le type de contrainte (avec obligation ou violée), la valeur résolue de la contrainte et le coût implicite associé.

Le Tableau 256 présente tous les attributs de ConstraintResults.

Tableau 256 – Attributs de MarketResults::ConstraintResults

nom	mult	type	description
baseFlow	0..1	Float	Flux de puissance de la base de la branche.
BGLimit	0..1	Float	Cette valeur est déterminée dans le DA et le RTM. L'optimisation SCUC garantit que le flux de MW du groupe de branches ne dépassera pas cette limite dans la bonne direction.
BGTRResCap	0..1	Float	Capacité de réservation TR du groupe de branches – Cette valeur est déterminée dans le DA et le RTM. Cela correspond à la quantité de capacité de transport restante utilisable par le détenteur des TR.
bindingLimit	0..1	Float	Limite en MW.
clearedValue	0..1	Float	MW octroyés.
competitivePathConstraint	0..1	YesNo	Indicateur de contrainte de voie non concurrentielle (Y/N) précisant si le coût implicite d'une voie non concurrentielle est différent de zéro.

nom	mult	type	description
constraintType	0..1	ResultsConstraintType	Type de contrainte.
limitFlag	0..1	ConstraintLimitType	Indicateur de limite ("Maximum", "Minimum").
optimizationFlag	0..1	YesNo	Inclus dans l'optimisation Y/N.
overloadMW	0..1	Float	MW de surcharge de transport.
percentMW	0..1	Float	Flux de MW réel en pourcentage de limite.
shadowPrice	0..1	Float	Coût implicite (\$/MW) du produit. Coût implicite de la contrainte correspondante.
updateTimeStamp	0..1	DateTime	Horodatage de mise à jour.
updateType	0..1	MQSCHGType	Type de changement du MQS.
updateUser	0..1	String	Utilisateur mis à jour.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 257 présente toutes les extrémités d'association de ConstraintResults avec d'autres classes.

**Tableau 257 – Extrémités d'association de MarketResults::
ConstraintResults avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	MktContingency	1..1	MktContingency	
0..*	ConstraintClearing	0..1	ConstraintClearing	
1..*	Flowgate	1..1	Flowgate	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.11 Classe racine DoplInstruction

Apporte les informations nécessaires (sur la base de ressources) pour la collecte des résultats du point d'exploitation de répartition (DOP – Dispatch Operating Point) sur un intervalle de répartition. Ces informations ne sont utiles que pour le marché d'intervalle RT.

Le Tableau 258 présente tous les attributs de DoplInstruction.

Tableau 258 – Attributs de MarketResults::DopInstruction

nom	mult	type	description
mwDOP	0..1	ActivePower	Point d'exploitation réparti (MW)
timestampDOP	0..1	DateTime	Horodatage du DOP
plotPriority	0..1	Integer	Valeur utilisée pour établir la priorité du DOP lors du traçage. Ceci s'applique uniquement lorsque deux DOP existent pour une même heure, mais avec des valeurs en MW différentes. Par exemple, lors de l'indication d'une étape sur la courbe. Elle est utilisée pour déterminer si la courbe monte ou descend.
runIndicatorDOP	0..1	YesNo	Indication de la validité du DOP. Indique que le DOP est calculé à partir du dernier processus (YES). L'indicateur NO indique que le DOP est copié depuis une exécution précédente. 2 intervalles maximum peuvent être manqués.
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	

Le Tableau 259 présente toutes les extrémités d'association de DopInstruction avec d'autres classes.

Tableau 259 – Extrémités d'association de MarketResults::DopInstruction avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	InstructionClearingDOP	1..*	InstructionClearingDOP	

6.5.6.3.12 Classe racine DotInstruction

Apporte les informations nécessaires (sur la base de ressources) pour la collecte des résultats de la cible d'exploitation de répartition (DOT – Dispatch Operating Target) sur un intervalle de répartition. Ces informations ne sont utiles que pour le marché d'intervalle RT.

Le Tableau 260 présente tous les attributs de DotInstruction.

Tableau 260 – Attributs de MarketResults::DotInstruction

nom	mult	type	description
actualRampRate	0..1	Float	Taux de rampe réel.
compliantIndicator	0..1	YesNo	Indicateur précisant si la ressource est conforme à l'instruction (plus/moins 10 %). Indique s'il est admis que le prix soit fixé par une unité (tarification ex-post).
DOT	0..1	Float	Valeur de la cible d'exploitation de répartition.
economicMaxOverride	0..1	Float	Remplacement de la limite maximale économique d'une unité: cette valeur est nulle. Sinon, cette valeur remplace la valeur de la colonne Énergie (Energy). Autorise le répartiteur à remplacer la valeur énergétique de l'unité.
expectedEnergy	0..1	Float	Énergie prévue.
generatorPerformanceDegree	0..1	Float	Degré de performances du générateur (DGP – <i>Degree of Generator Performance</i>) utilisé pour l'unité. Mesure de la façon dont un générateur répond pour augmenter/réduire les signaux. Calculé toutes les cinq minutes.
hourAheadSchedEnergy	0..1	Float	Résultats du HASP.
hourlySchedule	0..1	Float	Programme horaire (programme énergétique du DA).
instructionTime	0..1	DateTime	Date/Heure pour l'instruction.
maximumEmergencyInd	0..1	Boolean	True si le seuil d'urgence maximal est activé; sinon False. S'il est demandé à une unité d'atteindre son seuil d'urgence maximal, cet indicateur est défini sur True.
meterLoadFollowing	0..1	Float	Suivi de charge du sous-système du compteur.
nonRampRestrictedMW	0..1	Float	Quantité de MW souhaitée qui n'est pas restreinte par une rampe. Si aucune limite de taux de rampe n'existe pour l'unité, il s'agit de la valeur en MW sur laquelle l'unité a dû se positionner.
nonSpinReserve	0..1	Float	Réserve non tournante utilisée pour fournir de l'énergie.
previousDOTTimeStamp	0..1	DateTime	Horodatage de l'émission de la valeur DOT précédente.
rampRateLimit	0..1	Float	Limite du taux de rampe pour l'unité en MW par minute. Données d'offre du participant.
regulationStatus	0..1	YesNo	Statut de régulation (Yes/No).
spinReserve	0..1	Float	Réserve tournante utilisée pour fournir de l'énergie.
standardRampEnergy	0..1	Float	Énergie de rampe normalisée (MWh).
supplementalEnergy	0..1	Float	Énergie supplémentaire fournie par la répartition en temps réel.
unitStatus	0..1	Integer	Résultats de sortie du cas identifiant la raison pour laquelle l'unité a été engagée par le logiciel.

Le Tableau 261 présente toutes les extrémités d'association de DotInstruction avec d'autres classes.

Tableau 261 – Extrémités d'association de MarketResults::DotInstruction avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	InstructionClearingDOT	1..*	InstructionClearingDOT	

6.5.6.3.13 ExPostLoss

Modèle de calcul ex-post des pertes de MW.

Le Tableau 262 présente tous les attributs de ExPostLoss.

Tableau 262 – Attributs de MarketResults::ExPostLoss

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 263 présente toutes les extrémités d'association de ExPostLoss avec d'autres classes.

Tableau 263 – Extrémités d'association de MarketResults::ExPostLoss avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	ExPostLossResults	0..*	ExPostLossResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.14 Classe racine ExPostLossResults

Modélise les résultats de calcul ex-post des pertes de MW. Résume les pertes en deux catégories: pertes liées au transport très haute tension et pertes totales. Calcul effectué pour chaque zone de sous-contrôle.

Le Tableau 264 présente tous les attributs de ExPostLossResults.

Tableau 264 – Attributs de MarketResults::ExPostLossResults

nom	mult	type	description
totalLossMW	0..1	Float	Pertes totales de MW dans l'entreprise Utilisation de l'attribut: À titre informatif – Sortie du moteur LPA.
ehvLossMW	0..1	Float	Pertes de MW THT dans l'entreprise Utilisation de l'attribut: À titre informatif – Sortie du moteur LPA.

Le Tableau 265 présente toutes les extrémités d'association de ExPostLossResults avec d'autres classes.

Tableau 265 – Extrémités d'association de MarketResults::ExPostLossResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	ExPostLoss	1..1	ExPostLoss	
0..*	SubControlArea	0..1	SubControlArea	

6.5.6.3.15 ExPostMarketRegion

Modèle de calcul ex-post des MW octroyés sur une base régionale

Le Tableau 266 présente tous les attributs de ExPostMarketRegion.

Tableau 266 – Attributs de MarketResults::ExPostMarketRegion

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 267 présente toutes les extrémités d'association de ExPostMarketRegion avec d'autres classes.

Tableau 267 – Extrémités d'association de MarketResults::ExPostMarketRegion avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	ExPostMarketRegionResults	0..1	ExPostMarketRegionResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.16 Classe racine ExPostMarketRegionResults

Modèle de calcul ex-post des MW octroyés sur une base régionale. Comprend le prix d'équilibre

Le Tableau 268 présente tous les attributs de ExPostMarketRegionResults.

Tableau 268 – Attributs de MarketResults::ExPostMarketRegionResults

nom	mult	type	description
exPostClearedPrice	0..1	Float	

Le Tableau 269 présente toutes les extrémités d'association de ExPostMarketRegionResults avec d'autres classes.

Tableau 269 – Extrémités d'association de MarketResults::ExPostMarketRegionResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	ExPostMarketRegion	1..1	ExPostMarketRegion	
0..*	MarketRegion	1..1	MarketRegion	

6.5.6.3.17 ExPostPricing

Modèle de tarification ex-post des nœuds

Le Tableau 270 présente tous les attributs de ExPostPricing.

Tableau 270 – Attributs de MarketResults::ExPostPricing

nom	mult	type	description
energyPrice	0..1	Float	Prix de l'énergie sur le marché
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 271 présente toutes les extrémités d'association de ExPostPricing avec d'autres classes.

Tableau 271 – Extrémités d'association de MarketResults::ExPostPricing avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	ExPostResults	0..*	ExPostPricingResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.18 Classe racine ExPostPricingResults

Modèle de tarification ex-post des nœuds. Comprend les informations LMP, fondées sur Pnode.

Le Tableau 272 présente tous les attributs de ExPostPricingResults.

Tableau 272 – Attributs de MarketResults::ExPostPricingResults

nom	mult	type	description
congestLMP	0..1	Float	Composant de congestion d'un prix marginal local (LMP) en unités monétaires par MW; composant de congestion du LMP horaire à un nœud de tarification spécifique Utilisation de l'attribut: Résultat du logiciel de sécurité, tarification et répartition (SPD)/essai de faisabilité simultané (SFT) et correspond au composant de congestion horaire du LMP pour chaque nœud de tarification.
Imp	0..1	Float	LMP moyen pondéré de 5 min; prix marginal local du Pnode pour lequel le calcul de tarification est en cours d'exécution. Utilisation de l'attribut: LMP moyen pondéré de 5 min à afficher sur l'interface utilisateur
lossLMP	0..1	Float	Composant de perte d'un prix marginal local (LMP) en unités monétaires par MW; composant de perte du LMP horaire à un nœud de tarification spécifique Utilisation de l'attribut: Résultat du logiciel de sécurité, tarification et répartition (SPD – Security, Pricing, and Dispatch)/essai de faisabilité simultané (SFT – Simultaneous Feasibility Test) et correspond au composant de perte horaire du LMP pour chaque nœud de tarification.

Le Tableau 273 présente toutes les extrémités d'association de ExPostPricingResults avec d'autres classes.

Tableau 273 – Extrémités d'association de MarketResults::ExPostPricingResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	ExPostPricing	1..1	ExPostPricing	
0..*	Pnode	1..1	Pnode	

6.5.6.3.19 ExPostResource

Modèle de tarification ex-post des ressources.

Le Tableau 274 présente tous les attributs de ExPostResource.

Tableau 274 – Attributs de MarketResults::ExPostResource

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 275 présente toutes les extrémités d'association de ExPostResource avec d'autres classes.

Tableau 275 – Extrémités d'association de MarketResults::ExPostResource avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	ExPostResourceResults	0..*	ExPostResourceResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.20 Classe racine ExPostResourceResults

Modèle de tarification ex-post des ressources contenant des composants de LMP: énergie, congestion, perte. Fondé sur les ressources.

Le Tableau 276 présente tous les attributs de ExPostResourceResults.

Tableau 276 – Attributs de MarketResults::ExPostResourceResults

nom	mult	type	description
congestionLMP	0..1	Float	Composant LMP en dollars américains (déconseillé)
desiredMW	0..1	Float	Sortie souhaitée d'unités
dispatchRate	0..1	Float	Taux de répartition d'unité issu de la répartition d'unités en temps réel.
Imp	0..1	Float	LMP (<i>Local Marginal Price</i>) en dollars américains au niveau de l'équipement (déconseillé)
lossLMP	0..1	Float	Imp des pertes (déconseillé)
maxEconomicMW	0..1	Float	MW économique maximum
minEconomicMW	0..1	Float	MW économique minimum
resourceMW	0..1	Float	Sortie MW actuelle de l'équipement Utilisation de l'attribut: À titre informatif – À titre informatif – Sortie du moteur LPA.
status	0..1	EquipmentStatusType	Statut de l'équipement

Le Tableau 277 présente toutes les extrémités d'association de ExPostResourceResults avec d'autres classes.

Tableau 277 – Extrémités d'association de MarketResults::ExPostResourceResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
0..*	ExPostResource	1..1	ExPostResource	

6.5.6.3.21 GeneralClearing

Modèle de résultat d'équilibre du processus de marché au niveau du marché. Identifie l'intervalle

Le Tableau 278 présente tous les attributs de GeneralClearing.

Tableau 278 – Attributs de MarketResults::GeneralClearing

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 279 présente toutes les extrémités d'association de GeneralClearing avec d'autres classes.

Tableau 279 – Extrémités d'association de MarketResults::GeneralClearing avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	GeneralClearingResults	0..*	GeneralClearingResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.22 Classe racine GeneralClearingResults

Fournit la valeur prévisionnelle de la charge ajustée sur une base de zone de prévision de charge.

Le Tableau 280 présente tous les attributs de GeneralClearingResults.

Tableau 280 – Attributs de MarketResults::GeneralClearingResults

nom	mult	type	description
loadForecast	0..1	ActivePower	Prévision de charge (MW), par période de temps (5', 10', 15')
totalLoad	0..1	Float	Quantité de charge dans la Zone de réglage Utilisation de l'attribut: valeur de charge horaire pour le domaine spécifique
totalNetInterchange	0..1	Float	Quantité d'échange pour la Zone de réglage Utilisation de l'attribut: valeur d'échange horaire pour le domaine spécifique

Le Tableau 281 présente toutes les extrémités d'association de GeneralClearingResults avec d'autres classes.

Tableau 281 – Extrémités d'association de MarketResults::GeneralClearingResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	GeneralClearing	0..1	GeneralClearing	
0..*	SubControlArea	0..1	SubControlArea	

6.5.6.3.23 InstructionClearing

Modèle de mise en équilibre du marché relatif aux instructions d'engagement. Identifie l'intervalle

Le Tableau 282 présente tous les attributs de InstructionClearing.

Tableau 282 – Attributs de MarketResults::InstructionClearing

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 283 présente toutes les extrémités d'association de InstructionClearing avec d'autres classes.

Tableau 283 – Extrémités d'association de MarketResults::InstructionClearing avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	ResourceDeploymentStatus	0..*	ResourceDeploymentStatus	
0..*	ActualDemandResponseEvent	0..1	DistributedResourceActualEvent	ActualDemandResponseEvents pouvant exister sans faire partie d'un MarketActualEvent coordonné associé à un marché. Ces ActualDemandResponseEvents peuvent avoir plusieurs instructions InstructionClearing pour le type spécifié de RegisteredResources ou de ressource d'énergie distribuée de AggregateNodes.
1..*	Instructions	1..*	Instructions	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document

mult à partir de	nom	mult vers	type	description
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.24 InstructionClearingDOP

Modèle de mise en équilibre du marché relatif à DispatchOperatingPoint (point d'exploitation de répartition). Identifie l'intervalle

Le Tableau 284 présente tous les attributs de InstructionClearingDOP.

Tableau 284 – Attributs de MarketResults::InstructionClearingDOP

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 285 présente toutes les extrémités d'association de InstructionClearingDOP avec d'autres classes.

Tableau 285 – Extrémités d'association de MarketResults::InstructionClearingDOP avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	DopInstruction	1..*	DopInstruction	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.25 InstructionClearingDOT

Modèle de mise en équilibre du marché, relatif à Dispatch Operating Target (cible de répartition d'exploitation) (modèle de répartition anticipée). Identifie l'intervalle

Le Tableau 286 présente tous les attributs de InstructionClearingDOT.

Tableau 286 – Attributs de MarketResults::InstructionClearingDOT

nom	mult	type	description
contingencyActive	0..1	YesNo	Indique que le système fonctionne actuellement dans un mode avec contingence.
dispatchMode	0..1	AutomaticDispatchMode	
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 287 présente toutes les extrémités d'association de InstructionClearingDOT avec d'autres classes.

Tableau 287 – Extrémités d'association de MarketResults::InstructionClearingDOT avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	DotInstruction	1..*	DotInstruction	
0..*	DemandResponseActualEvent	0..1	DistributedResourceActualEvent	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.26 Classe racine Instructions

Apporte les informations nécessaires (sur la base de ressources) pour la collecte des résultats de l'instruction Démarrage/Arrêt. Ces informations sont utiles pour le DAM (RUC exclusivement) et le RTM (HASP, prépartition et intervalle).

Le Tableau 288 présente tous les attributs de Instructions.

Tableau 288 – Attributs de MarketResults::Instructions

nom	mult	type	description
bindingDOD	0..1	Float	Delta de répartition d'exploitation par obligation qui fournit un delta relatif à appliquer. Généralement utilisé dans les instructions de réponse à une demande. Il est possible de cumuler les instructions bindingDOD, c'est-à-dire qu'une deuxième instruction DOD ne remplace pas la DOD précédente. Au lieu de cela, la deuxième DOD s'ajoute aux DOD précédentes.
bindingDOT	0..1	Float	
bindingInstruction	0..1	YesNo	
instructionCost	0..1	Float	Coût total associé au changement du statut de la ressource.
instructionSource	0..1	MQSInstructionSource	source de l'instruction pour les résultats qualité du marché (INS, ACT)
instructionStartTime	0..1	DateTime	Moment auquel il convient que la ressource soit sur Pmin (pour les démarrages). Moment auquel la ressource est hors ligne.

nom	mult	type	description
instructionType	0..1	AutomaticDisplnstTypeCommitment	Indique s'il s'agit d'un démarrage ou d'un arrêt.
manuallyBlocked	0..1	YesNo	Indicateur de blocage manuel (Yes/No). L'instruction a été bloquée par un opérateur.
minStatusChangeTime	0..1	Integer	Temps de démarrage minimal exigé pour mettre l'unité en ligne (minutes). Temps de démarrage de la période d'engagement SCUC. Temps de démarrage calculé en fonction de StartUpTimeCurve, fourni avec la Bid. Il s'agit d'une combinaison de l'offre du temps de démarrage et du temps d'arrêt de l'unité. Unités en minutes
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
updateUser	0..1	String	

Le Tableau 289 présente toutes les extrémités d'association de Instructions avec d'autres classes.

Tableau 289 – Extrémités d'association de MarketResults:: Instructions avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	1..1	RegisteredResource	
1..*	InstructionClearing	1..*	InstructionClearing	
0..*	AggregateNode	0..1	AggregateNode	

6.5.6.3.27 Classe racine LoadFollowingOperatorInput

Modèle de capacités de suivi charge entrées par les opérateurs sur une base temporaire. Relatif aux ressources enregistrées dans les sous-systèmes mesurés

Le Tableau 290 présente tous les attributs de LoadFollowingOperatorInput.

Tableau 290 – Attributs de MarketResults::LoadFollowingOperatorInput

nom	mult	type	description
dataEntryTimeStamp	0..1	DateTime	Moment auquel la saisie de données a été réalisée.
tempLoadFollowingUpManualCap	0..1	Float	Capacité LFU entrée manuellement sur une base temporaire.
tempLoadFollowingDownManualCap	0..1	Float	Capacité LFD entrée manuellement sur une base temporaire.
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	

Le Tableau 291 présente toutes les extrémités d'association de LoadFollowingOperatorInput avec d'autres classes.

Tableau 291 – Extrémités d'association de MarketResults::LoadFollowingOperatorInput avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	

6.5.6.3.28 LossClearing

RT uniquement; n'est publié que toutes les 5 min pour les résultats des précédents intervalles de temps RT.

Le Tableau 292 présente tous les attributs de LossClearing.

Tableau 292 – Attributs de MarketResults::LossClearing

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 293 présente toutes les extrémités d'association de LossClearing avec d'autres classes.

Tableau 293 – Extrémités d'association de MarketResults::LossClearing avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	LossClearingResults	0..*	LossClearingResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.29 Classe racine LossClearingResults

Indique la quantité perdue de MW pour les zones RUC, les zones de sous-contrôle et la perte totale.

Le Tableau 294 présente tous les attributs de LossClearingResults.

Tableau 294 – Attributs de MarketResults::LossClearingResults

nom	mult	type	description
lossMW	0..1	Float	

Le Tableau 295 présente toutes les extrémités d'association de LossClearingResults avec d'autres classes.

Tableau 295 – Extrémités d'association de MarketResults::LossClearingResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	SubControlArea	0..1	SubControlArea	
0..*	LossClearing	0..1	LossClearing	
0..*	HostControlArea	0..1	HostControlArea	
0..*	RUCZone	0..1	RUCZone	

6.5.6.3.30 MPMClearing

Modèle des résultats des essais de l'emprise sur le marché et de l'atténuation éventuelle. Sur la base d'intervalles

Le Tableau 296 présente tous les attributs de MPMClearing.

Tableau 296 – Attributs de MarketResults::MPMClearing

nom	mult	type	description
LMPMFinalFlag	0..1	YesNo	
SMPMFinalFlag	0..1	YesNo	
mitigationOccuredFlag	0..1	YesNo	
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 297 présente toutes les extrémités d'association de MPMClearing avec d'autres classes.

Tableau 297 – Extrémités d'association de MarketResults::MPMClearing avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	MPMTestResults	0..*	MPMTestResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.31 Classe racine MPMResourceStatus

Modèle des résultats des essais de la puissance du marché. Indique le statut de la ressource pour l'intervalle associé

Le Tableau 298 présente tous les attributs de MPMResourceStatus.

Tableau 298 – Attributs de MarketResults::MPMResourceStatus

nom	mult	type	description
resourceStatus	0..1	String	Interval Test Status (Statut de l'essai de l'intervalle) 'N' – non applicable

Le Tableau 299 présente toutes les extrémités d'association de MPMResourceStatus avec d'autres classes.

Tableau 299 – Extrémités d'association de MarketResults::MPMResourceStatus avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
0..*	MPMTestCategory	1..1	MPMTestCategory	
0..*	MitigatedBidClearing	1..*	MitigatedBidClearing	

6.5.6.3.32 Classe racine MPMTestResults

Fournit les résultats des essais MPM sous forme de résultat et de pourcentage de marge (le cas échéant). A des relations avec la Zone des Designated Congestion Area Tests (essais de la zone de congestion désignée), CurveSchedData pour les essais du segment d'offres, avec la SubControlArea pour les essais à l'échelle du système, et avec les Pnodes pour les essais d'impact LMPM.

Le Tableau 300 présente tous les attributs de MPMTestResults.

Tableau 300 – Attributs de MarketResults::MPMTestResults

nom	mult	type	description
outcome	0..1	MPMTestOutcome	Résultats de l'essai. Pour les essais du prix, d'impact et conduits, les valeurs types sont NA, Pass (succès), Fail (échec), Disable (désactiver), ou Skip (ignorer).
marginPercent	0..1	PerCent	Utilisé pour représenter le résultat en % de marge à l'essai d'impact

Le Tableau 301 présente toutes les extrémités d'association de MPMTestResults avec d'autres classes.

Tableau 301 – Extrémités d'association de MarketResults::MPMTestResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MPMClearing	0..1	MPMClearing	
1..*	AggregatedPnode	1..1	AggregatedPnode	
0..*	MPMTestCategory	1..1	MPMTestCategory	

6.5.6.3.33 Classe racine MarketRegionResults

Fournit tous les résultats des services auxiliaires régionaux pour le DAM et le RTM. Les données spécifiques sont de type marchandises (régulation à la hausse, régulation à la baisse, réserve tournante, réserve non tournante ou total majoré des réserves) en fonction des MW octroyés, du prix d'équilibre et de la capacité totale exigée pour la région.

Le Tableau 302 présente tous les attributs de MarketRegionResults

Tableau 302 – Attributs de MarketResults::MarketRegionResults

nom	mult	type	description
clearedMW	0..1	Float	Valeur de production octroyée en MW. Pour AS, cette valeur est clearedMW = AS Total. Pour AS, clearedMW – selfScheduleMW = AS Procured
clearedPrice	0..1	Float	Prix marginal (\$/MW) pour la marchandise (énergie, régulation à la hausse, régulation à la baisse, réserve tournante ou réserve non tournante) en fonction du calcul du prix.
dispatchCtMW	0..1	Float	MW répartissables pour les unités de combustion.
dispatchHydroMW	0..1	Float	MW répartissables pour les unités hydrauliques.
dispatchRate	0..1	Float	Taux de répartition en MW/minute.
dispatchSteamMW	0..1	Float	MW répartissables pour les unités à vapeur.
imbalanceEnergyBias	0..1	Float	Influence énergétique du déséquilibre (MW) par période de temps (5 s uniquement)
limitFlag	0..1	ResourceLimitIndicator	Indicateurs AS locaux révélant si la limite supérieure ou inférieure de l'approvisionnement régional AS est contraignante
lumpyIndicator	0..1	YesNo	L'indicateur "arrondi" (Y/N) indique si la ressource qui définit le prix est un générateur irrégulier par heure pendant l'horizon temporel. Applicable uniquement au DAM
maxSufficiencyIndex	0..1	Float	Limite maximale de l'exigence régionale
minSufficiencyIndex	0..1	Float	Limite minimale de l'exigence régionale
reqMaxMW	0..1	Float	Limite maximale de l'exigence régionale
reqMinMW	0..1	Float	Limite minimale de l'exigence régionale
selfScheduleMW	0..1	Float	Aof AS, selfScheduleMW = AS Self-Provided

Le Tableau 303 présente toutes les extrémités d'association de MarketRegionResults avec d'autres classes.

Tableau 303 – Extrémités d'association de MarketResults::MarketRegionResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	MarketProduct	0..1	MarketProduct	
1..*	AncillaryServiceClearing	0..1	AncillaryServiceClearing	
1..*	MarketRegion	1..1	MarketRegion	

6.5.6.3.34 Classe racine MarketResults

Cette classe contient des éléments constitués de valeurs uniques pour l'ensemble de l'horizon temporel du marché. C'est-à-dire que pour le DAM, il y a une valeur pour chaque élément, non élaborée sur une base horaire. Récapitulatif du processus de marché

Le Tableau 304 présente tous les attributs de MarketResults.

Tableau 304 – Attributs de MarketResults::MarketResults

nom	mult	type	description
startUpCost	0..1	Float	Coût total de démarrage (\$) sur l'horizon temporel
minimumLoadCost	0..1	Float	Coût de charge minimal (\$) sur l'horizon temporel
contingentOperatingResAvail	0..1	YesNo	Indicateur global de disponibilité de réserve d'exploitation contingente (Yes/No)
energyCost	0..1	Float	Coût minimal en énergie (\$) sur l'horizon temporel
totalCost	0..1	Float	Coût total (énergie + AS) (\$) par heure pendant l'horizon temporel
ancillarySvcCost	0..1	Float	Coût AS total (c'est-à-dire le règlement) pendant l'horizon temporel
totalRucCost	0..1	Float	Capacité RUC totale pour cet intervalle

Le Tableau 305 présente toutes les extrémités d'association de MarketResults avec d'autres classes.

Tableau 305 – Extrémités d'association de MarketResults::MarketResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	EnergyMarket	1..1	EnergyMarket	

6.5.6.3.35 MarketStatement

Une déclaration (statement) est un ensemble d'éléments de lignes de déclaration. Chaque déclaration et ses éléments de lignes donnent le détail des charges spécifiques à tout moment. Utilisée par la facturation et le règlement

Le Tableau 306 présente tous les attributs de MarketStatement.

Tableau 306 – Attributs de MarketResults::MarketStatement

nom	mult	type	description
tradeDate	0..1	DateTime	Date à laquelle le règlement est effectué.
referenceNumber	0..1	String	Numéro de version de la précédente déclaration (en cas d'ajustement).
start	0..1	DateTime	Début d'une période de facturation.
end	0..1	DateTime	Fin d'une période de facturation.
transactionDate	0..1	DateTime	Date à laquelle la déclaration est émise.
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 307 présente toutes les extrémités d'association de MarketStatement avec d'autres classes.

Tableau 307 – Extrémités d'association de MarketResults::MarketStatement avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	MarketStatementLineItem	0..*	MarketStatementLineItem	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.36 MarketStatementLineItem

Élément individuel de ligne sur une déclaration de règlement ISO.

Le Tableau 308 présente tous les attributs de MarketStatementLineItem.

Tableau 308 – Attributs de MarketResults::MarketStatementLineItem

nom	mult	type	description
currentAmount	0..1	Float	Montant du règlement actuel.
currentISOAmount	0..1	Float	Montant du règlement ISO actuel.
currentISOQuantity	0..1	Float	Quantité du règlement ISO actuel.
currentPrice	0..1	Float	Prix du règlement actuel.
currentQuantity	0..1	Float	Quantité du règlement actuel, en fonction de l'unité de mesure.
intervalDate	0..1	DateTime	Date à laquelle le règlement est effectué.
intervalNumber	0..1	String	Nombre d'intervalles.
netAmount	0..1	Float	Montant net du règlement.
netISOAmount	0..1	Float	Montant net du règlement ISO.
netISOQuantity	0..1	Float	Quantité nette du règlement ISO.
netPrice	0..1	Float	Prix net du règlement.
netQuantity	0..1	Float	Quantité nette du règlement, en fonction de l'unité de mesure.
previousAmount	0..1	Float	Montant du précédent règlement.
previousISOAmount	0..1	Float	Montant du précédent règlement ISO.
previousISOQuantity	0..1	Float	Quantité du précédent règlement ISO.
previousPrice	0..1	Float	Prix du précédent règlement.
previousQuantity	0..1	Float	Quantité du règlement précédent, en fonction de l'unité de mesure.
quantityUOM	0..1	String	Unité de mesure de la quantité de l'élément de ligne.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 309 présente toutes les extrémités d'association de MarketStatementLineItem avec d'autres classes.

Tableau 309 – Extrémités d'association de MarketResults::MarketStatementLineItem avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktUserAttribute	0..*	MktUserAttribute	
0..*	MarketStatement	1..1	MarketStatement	
0..*	ContainerMarketStatementLineItem	0..1	MarketStatementLineItem	
0..1	PassThroughBill	0..1	PassThroughBill	
0..1	ComponentMarketStatementLineItem	0..*	MarketStatementLineItem	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.37 MitigatedBid

Résultats d'une offre atténuée publiés pour une période de règlement précise.

Le Tableau 310 présente tous les attributs de MitigatedBid.

Tableau 310 – Attributs de MarketResults::MitigatedBid

nom	mult	type	description
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 311 présente toutes les extrémités d'association de MitigatedBid avec d'autres classes.

Tableau 311 – Extrémités d'association de MarketResults::MitigatedBid avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Bid	0..1	Bid	
0..*	MitigatedBidClearing	1..*	MitigatedBidClearing	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.38 MitigatedBidClearing

Modèle d'atténuation de l'emprise sur le marché fondé sur des offres de références ou des offres atténuées. Sur la base d'intervalles.

Le Tableau 312 présente tous les attributs de MitigatedBidClearing.

Tableau 312 – Attributs de MarketResults::MitigatedBidClearing

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 313 présente toutes les extrémités d'association de MitigatedBidClearing avec d'autres classes.

Tableau 313 – Extrémités d'association de MarketResults::MitigatedBidClearing avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	MPMResourceStatus	0..*	MPMResourceStatus	
1..*	MitigatedBid	0..*	MitigatedBid	
1..*	RMRDetermination	0..*	RMRDetermination	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject

mult à partir de	nom	mult vers	type	description
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.39 Classe racine MitigatedBidSegment

Modèle d'offre atténuée. Indique un segment d'offre linéaire par morceaux qui a été atténué

Le Tableau 314 présente tous les attributs de MitigatedBidSegment.

Tableau 314 – Attributs de MarketResults::MitigatedBidSegment

nom	mult	type	description
intervalStartTime	0..1	DateTime	
thresholdType	0..1	String	
segmentNumber	0..1	Integer	Numéro de segment de l'offre atténuée
segmentMW	0..1	Float	Valeur MW du segment de l'offre atténuée

Le Tableau 315 présente toutes les extrémités d'association de MitigatedBidSegment avec d'autres classes.

Tableau 315 – Extrémités d'association de MarketResults::MitigatedBidSegment avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	Bid	1..1	Bid	

6.5.6.3.40 PassThroughBill

PassThroughBill est utilisé pour:

- 1) Des transactions de charge dans les deux sens avec ou sans implication ISO
- 2) Des charges ou paiements directs spécifiques calculés de façon externe ou fournis directement aux règlements
- 3) Des éléments déterminants spécifiques à la facturation des charges fournis de façon externe et utilisés pour le calcul des frais

Le Tableau 316 présente tous les attributs de PassThroughBill.

Tableau 316 – Attributs de MarketResults::PassThroughBill

nom	mult	type	description
adjustedAmount	0..1	Money	
amount	0..1	Money	Montant des frais du produit/service.
billedTo	0..1	String	Entreprise à laquelle la transaction PTB est facturée.
billEnd	0..1	DateTime	Date de fin de la période de facturation
billRunType	0..1	String	Type de processus de règlement; par exemple, prélim., final et nouveau processus.
billStart	0..1	DateTime	Date de début de la période de facturation
effectiveDate	0..1	DateTime	Date effective de la transaction
isDisputed	0..1	Boolean	Indicateur de transaction litigieuse
isProfiled	0..1	Boolean	Indicateur selon lequel des données de profil sont associées ou non au PTB.
paidTo	0..1	String	Entreprise à laquelle la transaction PTB est réglée.
previousEnd	0..1	DateTime	Date de fin de la précédente période de facturation
previousStart	0..1	DateTime	Date de début de la précédente période de facturation
price	0..1	Money	Prix du produit/service.
productCode	0..1	String	Identifiant du produit pour la détermination du type de charge de la transaction.
providedBy	0..1	String	Entreprise auprès de laquelle la transaction PTB est effectuée.
quantity	0..1	FloatQuantity	Quantité du produit.
serviceEnd	0..1	DateTime	Date de fin de la prestation de service, si périodique.
serviceStart	0..1	DateTime	Date de début de la prestation de service, si périodique.
soldTo	0..1	String	Entreprise à laquelle la transaction PTB est vendue.
taxAmount	0..1	Money	Part des taxes sur les services sélectionnés.
timeZone	0..1	String	Code du fuseau horaire
tradeDate	0..1	DateTime	Date d'opération
transactionDate	0..1	DateTime	Date à laquelle a lieu la transaction.
transactionType	0..1	String	Type de la transaction. Par exemple, taxe client, facturation client, correspondance créances clients/comptes créditeurs ou éléments déterminants de facturation
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document

nom	mult	type	description
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 317 présente toutes les extrémités d'association de PassThroughBill avec d'autres classes.

Tableau 317 – Extrémités d'association de MarketResults::PassThroughBill avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktUserAttribute	0..*	MktUserAttribute	
0..1	MarketStatementLineItem	0..1	MarketStatementLineItem	
0..1	ChargeProfiles	0..*	ChargeProfile	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.41 PnodeClearing

Résultats d'équilibre d'un nœud de tarification publiés pour une période de règlement précise.

Le Tableau 318 présente tous les attributs de PnodeClearing.

Tableau 318 – Attributs de MarketResults::PnodeClearing

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document

nom	mult	type	description
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 319 présente toutes les extrémités d'association de PnodeClearing avec d'autres classes.

**Tableau 319 – Extrémités d'association de MarketResults::
PnodeClearing avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..1	CommodityPrice	0..*	CommodityPrice	
0..1	PnodeResults	1..*	PnodeResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.42 Classe racine PnodeResults

Fournit le prix total, le composant de coût, le composant de perte et le composant de congestion pour les Pnodes des DAM / RTM. Plusieurs prix sont produits en fonction du type de processus (MPM, RUC, tarification ou programmation/répartition).

Le Tableau 320 présente tous les attributs de PnodeResults.

Tableau 320 – Attributs de MarketResults::PnodeResults

nom	mult	type	description
marginalClearingPrice	0..1	Float	Prix marginal local (LMP) (\$/MWh)
costLMP	0..1	Float	Composant coût du prix marginal local (LMP) en unités monétaires par MW.
lossLMP	0..1	Float	Composant perte du prix marginal local (LMP) en unités monétaires par MW.
congestLMP	0..1	Float	Composant congestion du prix marginal local (LMP) en unités monétaires par MW.
scheduledMW	0..1	Float	Programme MW total au niveau de Pnode
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	

Le Tableau 321 présente toutes les extrémités d'association de PnodeResults avec d'autres classes.

Tableau 321 – Extrémités d'association de MarketResults::PnodeResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	PnodeClearing	0..1	PnodeClearing	
1..*	Pnode	0..1	Pnode	

6.5.6.3.43 Classe racine PriceDescriptor

Le prix d'une marchandise peut varier dans le temps au cours d'un intervalle donné. Par exemple, un prix peut être prévu un an à l'avance, un mois à l'avance, un jour à l'avance, une heure à l'avance et en temps réel; ceci est défini à l'aide du MarketType. En outre, un prix peut avoir un ou plusieurs composants. Par exemple, un prix marginal local d'énergie peut être calculé comme la somme arithmétique du prix du système, du prix de congestion et du prix-réclame. L'énumération priceType est utilisée pour déterminer si le prix est le prix total (priceType="total") ou l'un des composants constituants potentiellement nombreux.

Le Tableau 322 présente tous les attributs de PriceDescriptor.

Tableau 322 – Attributs de MarketResults::PriceDescriptor

nom	mult	type	description
marketType	0..1	MarketType	Cadre temporel correspondant au prix, conformément aux conventions normalisées associées à l'énumération MarketType.
priceType	0..1	PriceTypeKind	"kind" (type) de prix décrit. En général, le priceType est soit "total", c'est-à-dire que le prix est le prix réglé pour acheter ou vendre la marchandise (parfois appelé prix "all-in" (prix global)), soit l'un des composants potentiellement nombreux.

Le Tableau 323 présente toutes les extrémités d'association de PriceDescriptor avec d'autres classes.

Tableau 323 – Extrémités d'association de MarketResults::PriceDescriptor avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	CommodityPrice	1..*	CommodityPrice	

6.5.6.3.44 Classe racine RMRDetermination

Indique s'il s'agit d'une unité RMR (Reliability Must Run – marche obligatoire pour fiabilité): son activation est exigée pour satisfaire aux critères de fiabilité du code de réseau, à la demande de charge ou à la prise en charge de la tension.

Le Tableau 324 présente toutes les extrémités d'association de RMRDetermination avec d'autres classes.

Tableau 324 – Extrémités d'association de MarketResults::RMRDetermination avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MitigatedBidClearing	1..*	MitigatedBidClearing	
0..*	Bid	0..1	Bid	

6.5.6.3.45 RMROperatorInput

Saisie par l'opérateur RMR des exigences RMR par intervalle de marché.

Le Tableau 325 présente tous les attributs de RMROperatorInput.

Tableau 325 – Attributs de MarketResults::RMROperatorInput

nom	mult	type	description
manuallySchedRMRMw	0..1	Float	La valeur inférieure de la prépartition originelle ou du processus à courant alternatif (ou exigence RMR) devient la valeur de prépartition.
updateUser	0..1	String	
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document

nom	mult	type	description
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 326 présente toutes les extrémités d'association de RMROperatorInput avec d'autres classes.

**Tableau 326 – Extrémités d'association de MarketResults:
RMROperatorInput avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.46 Classe racine RUCAwardInstruction

Cette classe modélise les informations relatives aux attributions RUC

Le Tableau 327 présente tous les attributs de RUCAwardInstruction.

Tableau 327 – Attributs de MarketResults::RUCAwardInstruction

nom	mult	type	description
clearedPrice	0..1	Float	Prix marginal (\$/MW) pour la marchandise (régulation à la hausse, régulation à la baisse, réserve tournante ou réserve non tournante) pour le calcul du prix.
marketProductType	0..1	MarketProductType	Le type de produit majeur peut comprendre, entre autres, les éléments suivants: Énergie Régulation à la hausse Régulation à la baisse Réserve tournante Réserve non tournante Réserve d'exploitation
RUCAward	0..1	Float	L'attribution RUC d'une ressource est la part de capacité RUC qui n'est pas soumise à un contrat RA ou RMR. L'attribution RUC d'une ressource est la part de capacité RUC qui est éligible pour un règlement de disponibilité RUC.
RUCCapacity	0..1	Float	La capacité RUC d'une ressource est la différence entre (i) le RUC Schedule et (ii) la valeur supérieure du programme DA et la charge minimum.
RUCSchedule	0..1	Float	RUCSchedule d'une ressource constitue son niveau de sortie qui équilibre la prévision de charge utilisée dans RUC. La RUCSchedule dans RUC est similaire au DA Schedule dans DAM.
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
updateUser	0..1	String	

Le Tableau 328 présente toutes les extrémités d'association de RUCAwardInstruction avec d'autres classes.

Tableau 328 – Extrémités d'association de MarketResults::RUCAwardInstruction avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	ClearingResourceAward	1..*	ResourceAwardClearing	

6.5.6.3.47 ResourceAwardClearing

Modélise les détails de l'offre et de la mise en équilibre du marché. La classe indique si une contingence est active et si le système de répartition automatique est actif pour cet intervalle de la solution de marché.

Le Tableau 329 présente tous les attributs de ResourceAwardClearing.

Tableau 329 – Attributs de MarketResults::ResourceAwardClearing

nom	mult	type	description
dispatchMode	0..1	AutomaticDispatchMode	
contingencyActive	0..1	YesNo	Indique que le système fonctionne actuellement dans un mode avec contingence.
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 330 présente toutes les extrémités d'association de ResourceAwardClearing avec d'autres classes.

Tableau 330 – Extrémités d'association de MarketResults::ResourceAwardClearing avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..*	RUCAwardInstruction	1..*	RUCAwardInstruction	
1..*	ResourceAwardInstruction	1..*	ResourceAwardInstruction	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.48 Classe racine ResourceAwardInstruction

Modèle des résultats du marché, instruction pour la ressource. Contient les détails d'attribution comme attributs

Le Tableau 331 présente tous les attributs de ResourceAwardInstruction.

Tableau 331 – Attributs de MarketResults::ResourceAwardInstruction

nom	mult	type	description
awardMW	0..1	Float	Pour énergie DA: Non applicable; Pour AS DA: Attribution marché AS DA; Pour énergie RT: Non applicable; Pour AS RT: Attribution marché AS RT (à l'exception des attributions relatives au marché AS DA et à l'alimentation automatique)
clearedMW	0..1	Float	Pour énergie DA: Programme total = programme du marché à J-1 (DAM) + attribution à programmation automatique à J-1 (DA); Pour AS DA: Attributions services auxiliaires DA = attribution marché AS DA + attribution à programmation automatique AS DA; Pour énergie RT: Programme total = programme RTM + attribution planification automatique RT; Pour AS RT: Attributions services auxiliaires RT = attribution à programmation automatique RT + attribution marché AS RT + attribution marché AS DA + attribution à programmation automatique AS DA;
clearedPrice	0..1	Float	Prix marginal (\$/MW) pour la marchandise (régulation à la hausse, régulation à la baisse, réserve tournante ou réserve non tournante) pour le calcul du prix.
congestLMP	0..1	Float	Composant congestion du prix marginal local (LMP) en unités monétaires par MW.
costLMP	0..1	Float	Composant coût du prix marginal local (LMP) en unités monétaires par MW.
dispatcherAddedMW	0..1	Float	Quantité MW tier2 ajoutée par le répartiteur Résultats du marché du marché des réserves synchronisées
economicMax	0..1	Float	Sortie max. de l'unité pour la répartition; offre comprise dans le maximum économique
economicMin	0..1	Float	Sortie min. de l'unité pour la répartition; offre comprise dans le minimum économique
effRegulationDownLimit	0..1	Float	Limite effective de régulation à la baisse (MW)
effRegulationUpLimit	0..1	Float	Limite effective de régulation à la hausse
Imp	0..1	Float	Valeur du prix marginal local
lossLMP	0..1	Float	Composant perte du prix marginal local (LMP) en unités monétaires par MW.
manuallyBlocked	0..1	YesNo	Indique si une attribution a été bloquée manuellement (Y/N). Valide pour la réserve tournante et non tournante.
marginalResourceIndicator	0..1	YesNo	Indicateur (Yes/No) selon lequel cette ressource définit le prix pour la répartition/programme
mustRunInd	0..1	Boolean	Identifie si l'unité a été configurée pour devoir être exécutée par le participant du marché en charge des offres dans l'unité

nom	mult	type	description
noLoadCost	0..1	Float	Coût à charge nulle de l'unité en cas de marchandise énergétique
optimalBidCost	0..1	Float	Coût optimal de l'offre
optimalBidPay	0..1	Float	Règlement optimal de réalisation de l'offre en fonction du prix marginal local
optimalMargin	0..1	Float	Marge optimale de réalisation de l'offre
overrideTimeStamp	0..1	DateTime	Heure de la saisie manuelle de données.
overrideValue	0..1	Float	Fournit la capacité pour l'opérateur de réseau de remplacer des éléments, tels que les exigences en rotation, avant d'exécuter l'algorithme. Cette valeur est fondée sur les produits du marché (rotation, non-rotation, régulation à la hausse, régulation à la baisse ou RUC).
selfSchedMW	0..1	Float	Pour énergie DA: Attribution à programmation automatique totale DA; Pour AS DA: Attribution alimentation automatique AS DA; Pour énergie RT: Attribution à programmation automatique totale RT; Pour AS RT: Attribution alimentation automatique AS RT (à l'exception des attributions relatives au marché AS DA et à alimentation automatique)
startUpCost	0..1	Float	Coût de démarrage de l'unité en cas de marchandise énergétique
status	0..1	String	Dans ou en dehors du statut de la ressource
totalRevenue	0..1	Float	Revenu total de l'offre (startup_cost + no_load_cost + bid_pay)
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
updateUser	0..1	String	

Le Tableau 332 présente toutes les extrémités d'association de ResourceAwardInstruction avec d'autres classes.

**Tableau 332 – Extrémités d'association de MarketResults::
ResourceAwardInstruction avec d'autres classes**

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..1	SelfScheduleBreakdown	0..*	SelfScheduleBreakdown	
0..*	MarketProduct	1..1	MarketProduct	
1..*	ClearingResourceAward	1..*	ResourceAwardClearing	

6.5.6.3.49 ResourceClearing

Modèle des résultats du marché, y compris les résultats équilibrés des ressources. Associé à ResourceDispatchResults.

Le Tableau 333 présente tous les attributs de ResourceClearing.

Tableau 333 – Attributs de MarketResults::ResourceClearing

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 334 présente toutes les extrémités d'association de ResourceClearing avec d'autres classes.

Tableau 334 – Extrémités d'association de MarketResults::ResourceClearing avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	ResourceDispatchResults	1..*	ResourceDispatchResults	
0..1	ResourceLoadFollowingInst	0..*	ResourceLoadFollowingInst	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.50 Classe racine ResourceDeploymentStatus

Le Tableau 335 présente tous les attributs de ResourceDeploymentStatus.

Tableau 335 – Attributs de MarketResults::ResourceDeploymentStatus

nom	mult	type	description
acceptComments	0..1	String	Commentaires expliquant le motif du statut d'acceptation, par exemple, expliquant pourquoi une demande n'est acceptée que partiellement et pas complètement.
acceptStatus	0..1	String	Statut de la ressource pour ce déploiement. Les valeurs comprennent (full compliance (conformité totale), partial compliance (conformité partielle), opt-out (désistement), etc.)
resourceResponseMW	0..1	Float	Le montant en MW de la ressource peut contribuer à ce déploiement. Il provient du fournisseur DR – comme réponse? Ou comme valeur réelle? Cela intervient-il dans le cadre de la liquidation? À voir.

Le Tableau 336 présente toutes les extrémités d'association de ResourceDeploymentStatus avec d'autres classes.

Tableau 336 – Extrémités d'association de MarketResults::ResourceDeploymentStatus avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	InstructionClearing	0..1	InstructionClearing	

6.5.6.3.51 Classe racine ResourceDispatchResults

La classe ResourceDispatchResults comprend les résultats de marché qui peuvent être transmis à un coordinateur de programmation (SC). Les données spécifiques fournies se composent de plusieurs indicateurs tels que les indicateurs de contingence, le démarrage bloqué et la répartition RMR. Elles fournissent par ailleurs le statut prévisionnel global et le statut de régulation de la ressource.

Le Tableau 337 présente tous les attributs de ResourceDispatchResults.

Tableau 337 – Attributs de MarketResults::ResourceDispatchResults

nom	mult	type	description
blockedDispatch	0..1	String	Indicateur de répartition bloquée (Yes/No).
blockedPublishDOP	0..1	String	Blocage envoyant DOP vers ADS (Y/N)
contingencyFlag	0..1	YesNo	Indicateur de réserve d'exploitation contingente (Yes/No). Ressource participant à la capacité AS dans la répartition de la contingence.
limitIndicator	0..1	String	Indique quelle limite constitue la contrainte
lowerLimit	0..1	Float	Limite inférieure de rampe d'énergie de la ressource
maxRampRate	0..1	Float	Taux de rampe maximum
operatingLimitHigh	0..1	Float	Limite opérationnelle supérieure intégrant toute réduction utilisée par la répartition en temps réel (RTD) pour l'intervalle de liaison.

nom	mult	type	description
operatingLimitLow	0..1	Float	Limite opérationnelle inférieure intégrant toute réduction utilisée par la répartition en temps réel pour l'intervalle de liaison.
penaltyDispatchIndicator	0..1	YesNo	Indicateur de répartition à pénalité (Yes / No) révélant une régulation non économique.
regulatingLimitHigh	0..1	Float	Limite de régulation supérieure intégrant toute réduction utilisée par la répartition en temps réel (RTD) pour l'intervalle de liaison.
regulatingLimitLow	0..1	Float	Limite de régulation inférieure intégrant toute réduction utilisée par la répartition en temps réel pour l'intervalle de liaison.
resourceStatus	0..1	String	Statut d'engagement de l'unité (Marche/Arrêt/Démarrage)
totalSchedule	0..1	Float	Programme ascendant total des ressources. Programme total = En + toutes les AS par ressource et par intervalle
updateTimeStamp	0..1	DateTime	
updateType	0..1	MQSCHGType	
updateUser	0..1	String	
upperLimit	0..1	Float	Limite supérieure de rampe d'énergie de la ressource

Le Tableau 338 présente toutes les extrémités d'association de ResourceDispatchResults avec d'autres classes.

Tableau 338 – Extrémités d'association de MarketResults::ResourceDispatchResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
1..*	ResourceClearing	0..1	ResourceClearing	

6.5.6.3.52 Classe racine ResourceLoadFollowingInst

Modèle des résultats d'équilibre du marché pour les ressources réalisant des offres pour être conformes à la charge

Le Tableau 339 présente tous les attributs de ResourceLoadFollowingInst.

Tableau 339 – Attributs de MarketResults::ResourceLoadFollowingInst

nom	mult	type	description
instructionID	0..1	String	Identifiant d'instruction unique pour chaque instruction; affecté par le coordinateur de programmation et fourni à l'ADS. L'ADS passe à travers.
intervalStartTime	0..1	DateTime	Début de l'intervalle de temps pour lequel une exigence est définie.
calcLoadFollowingMW	0..1	Float	Moyenne pondérée pour RTPD et RTCD et identique pour RTID
dispWindowLowLimt	0..1	Float	
dispWindowHighLimt	0..1	Float	

Le Tableau 340 présente toutes les extrémités d'association de ResourceLoadFollowingInst avec d'autres classes.

Tableau 340 – Extrémités d'association de MarketResults::ResourceLoadFollowingInst avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	0..1	RegisteredResource	
0..*	ResourceClearing	0..1	ResourceClearing	

6.5.6.3.53 ResourcePerformanceEvaluation

Représente une évaluation de performances du déploiement d'une ressource. Chaque déploiement de ressource peut avoir plusieurs évaluations de performances effectuées par le biais de différentes mesures d'évaluation ou de différents algorithmes, ou par différentes autorités d'évaluation.

Le Tableau 341 présente tous les attributs de ResourcePerformanceEvaluation.

Tableau 341 – Attributs de MarketResults::ResourcePerformanceEvaluation

nom	mult	type	description
effectiveEndTime	0..1	DateTime	
effectiveStartTime	0..1	DateTime	
evaluationDescription	0..1	String	Description de l'évaluation de performances, par exemple, la classification des valeurs assignées utilisée (elles sont toutes admises), la raison pour laquelle l'évaluation a été effectuée, tout élément décrivant l'évaluation de performances de réponse à la demande.
evaluationValue	0..1	String	Valeurs des performances. Étant donné qu'il s'agit d'une valeur String (chaîne de caractères), tous les systèmes de valeurs assignées sont pris en charge (par exemple, "1", "2", "3" ou "low" (faible), "medium" (moyen), "high" (élevé)). Le système de valeurs assignées est décrit dans l'attribut performanceValueDescription.
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 342 présente toutes les extrémités d'association de ResourcePerformanceEvaluation avec d'autres classes.

Tableau 342 – Extrémités d'association de MarketResults::ResourcePerformanceEvaluation avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	ResourcePerformanceTimeSeriesFactors	0..*	ResourcePerformanceTimeSeriesFactor	
0..*	DemandResponseActualEvent	1..1	DistributedResourceActualEvent	
0..*	ResourcePerformanceGlobalFactor	0..*	ResourcePerformanceGlobalFactor	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.54 ResourcePerformanceGlobalFactor

Les facteurs globaux sont des paires propriété/valeur utilisées pour ajuster les valeurs des performances de la ressource; par exemple, les facteurs d'échelle (par exemple, passage de la base de référence à l'échelle supérieure ou inférieure), les additionneurs (positifs ou négatifs), etc.

Le Tableau 343 présente tous les attributs de ResourcePerformanceGlobalFactor.

Tableau 343 – Attributs de MarketResults::ResourcePerformanceGlobalFactor

nom	mult	type	description
factorDescription	0..1	String	Description (nom) de la priorité (facteur).
factorValue	0..1	String	Valeur de la priorité (facteur).
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 344 présente toutes les extrémités d'association de ResourcePerformanceGlobalFactor avec d'autres classes.

Tableau 344 – Extrémités d'association de MarketResults::ResourcePerformanceGlobalFactor avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	ResourcePerformanceEvaluation	0..*	ResourcePerformanceEvaluation	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.55 ResourcePerformanceRating

Caractéristiques assignées d'une ressource pour des performances de réponse à la demande, par exemple, pour un ensemble d'échantillonnage soumis à des évaluations mensuelles de performances de réponse à la demande, la ressource peut avoir la valeur assignée "excellent", "average" (moyen) ou "poor performance" (performances médiocres) pour l'ensemble échantillon

Le Tableau 345 présente tous les attributs de ResourcePerformanceRating.

Tableau 345 – Attributs de MarketResults::ResourcePerformanceRating

nom	mult	type	description
effectiveEndTime	0..1	DateTime	Date et heure de début de validité des caractéristiques assignées
effectiveStartTime	0..1	DateTime	Date et heure de fin de validité des caractéristiques assignées
ratingDescription	0..1	String	Description des caractéristiques assignées de réponse à la demande de la ressource
ratingType	1..1	String	Type de performances assignées, par exemple, à quel marché ou à quel produit s'applique l'assignation
ratingValue	0..1	String	Caractéristiques assignées de réponse à la demande de la ressource
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 346 présente toutes les extrémités d'association de ResourcePerformanceRating avec d'autres classes.

Tableau 346 – Extrémités d'association de MarketResults::ResourcePerformanceRating avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	RegisteredResource	1..1	RegisteredDistributedResource	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.56 ResourcePerformanceTimeSeriesFactor

Représente les performances d'une ressource sous forme de données de série chronologique pour une période de temps, un intervalle de temps et des critères d'évaluation spécifiques.

Le Tableau 347 présente tous les attributs de ResourcePerformanceTimeSeriesFactor.

Tableau 347 – Attributs de MarketResults::ResourcePerformanceTimeSeriesFactor

nom	mult	type	description
timeSeriesDataType	0..1	String	Type de données de la série chronologique, par exemple, données de base, données relevées sur le compteur, données de performances calculées.
timeSeriesDescription	0..1	String	Description facultative des données de la série chronologique, par exemple, données de base, données relevées sur le compteur, données de performances calculées.
value1Description	0..1	String	Description de la valeur1 contenue dans le TimeSeriesFactor.
value2Description	0..1	String	Description de la valeur2 contenue dans le TimeSeriesFactor.
endTime	0..1	DateTime	Hérité de: RegularIntervalSchedule
timeStep	0..1	Seconds	Hérité de: RegularIntervalSchedule
startTime	0..1	DateTime	Hérité de: BasicIntervalSchedule
value1Multiplier	0..1	UnitMultiplier	Hérité de: BasicIntervalSchedule
Value1Unit	0..1	UnitSymbol	Hérité de: BasicIntervalSchedule
value2Multiplier	0..1	UnitMultiplier	Hérité de: BasicIntervalSchedule
Value2Unit	0..1	UnitSymbol	Hérité de: BasicIntervalSchedule
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 348 présente toutes les extrémités d'association de ResourcePerformanceTimeSeriesFactor avec d'autres classes.

Tableau 348 – Extrémités d'association de MarketResults::ResourcePerformanceTimeSeriesFactor avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	ResourcePerformanceEvaluation	1..1	ResourcePerformanceEvaluation	
1..1	TimePoints	1..*	RegularTimePoint	Hérité de: RegularIntervalSchedule
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.57 Classe racine SelfScheduleBreakdown

Modèle des résultats à programmations automatiques. Comprend les quantités de MW à programmation automatique et le type de programmation automatique pour chaque type à programmation automatique inclus dans la valeur totale des MW à programmation automatique trouvée dans ResourceAwardInstruction.

Le Tableau 349 présente tous les attributs de SelfScheduleBreakdown.

Tableau 349 – Attributs de MarketResults::SelfScheduleBreakdown

nom	mult	type	description
selfSchedMW	0..1	Float	Valeur d'équilibre pour le type à programmation automatique spécifique répertorié.
selfSchedType	0..1	SelfScheduleBreakdownType	Type de panne de programmation automatique.

Le Tableau 350 présente toutes les extrémités d'association de SelfScheduleBreakdown avec d'autres classes.

Tableau 350 – Extrémités d'association de MarketResults::SelfScheduleBreakdown avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	ResourceAwardInstruction	1..1	ResourceAwardInstruction	

6.5.6.3.58 Settlement

Spécifie un processus de règlement.

Le Tableau 351 présente tous les attributs de Settlement.

Tableau 351 – Attributs de MarketResults::Settlement

nom	mult	type	description
tradeDate	0..1	DateTime	Date d'opération à laquelle le règlement est effectué.
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 352 présente toutes les extrémités d'association de Settlement avec d'autres classes.

Tableau 352 – Extrémités d'association de MarketResults::Settlement avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MarketInvoiceLineItem	0..*	MarketInvoiceLineItem	
0..*	MarketLedgerEntry	0..*	MarketLedgerEntry	
0..*	EnergyMarket	0..1	EnergyMarket	
0..*	MajorChargeGroup	1..*	MajorChargeGroup	
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.59 TransactionBidClearing

Contient les intervalles utiles pour le TransactionBidResults associé. Par exemple, les résultats d'équilibre à J-1 pour les offres des transactions de chaque intervalle du jour de marché.

Le Tableau 353 présente tous les attributs de TransactionBidClearing.

Tableau 353 – Attributs de MarketResults::TransactionBidClearing

nom	mult	type	description
intervalEndTime	0..1	DateTime	Hérité de: MarketFactors
intervalStartTime	0..1	DateTime	Hérité de: MarketFactors
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 354 présente toutes les extrémités d'association de TransactionBidClearing avec d'autres classes.

Tableau 354 – Extrémités d'association de MarketResults::TransactionBidClearing avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	TransactionBidResults	0..*	TransactionBidResults	
0..*	MktActivityRecord	0..*	MktActivityRecord	Hérité de: MarketFactors
0..*	Market	0..1	Market	Hérité de: MarketFactors
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.6.3.60 TransactionBidResults

Contient les résultats d'équilibre pour chaque TransactionBid soumise au et acceptée par le marché.

Le Tableau 355 présente tous les attributs de TransactionBidResults.

Tableau 355 – Attributs de MarketResults::TransactionBidResults

nom	mult	type	description
clearedMW	0..1	Float	Quantité de mégawatts de la transaction du marché
clearedPrice	0..1	Float	Prix de la transaction de marché
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 356 présente toutes les extrémités d'association de TransactionBidResults avec d'autres classes.

Tableau 356 – Extrémités d'association de MarketResults::TransactionBidResults avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	TransactionBidClearing	1..1	TransactionBidClearing	
0..*	TransactionBid	0..1	TransactionBid	
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.7 Paquetage MktDomain

6.5.7.1 Généralités

Le paquetage MktDomain est une bibliothèque de données regroupant les grandeurs et les unités qui définissent les types de données des attributs (propriétés) pouvant être repris par n'importe quelle classe dans n'importe quel autre paquetage au sein de MarketOperations.

6.5.7.2 Énumération ActionType

Type d'action associé avec un ActionRequest par rapport à un ParticipantInterfaces::Trade.

Le Tableau 357 présente tous les libellés de ActionType.

Tableau 357 – Libellés de MktDomain::ActionType

libellé	valeur	description
CANCEL		Annule une opération.

6.5.7.3 Énumération AnalogLimitType

Type de limite spécifié pour AnalogLimits.

Le Tableau 358 présente tous les libellés de AnalogLimitType.

Tableau 358 – Libellés de MktDomain::AnalogLimitType

libellé	valeur	description
BranchMediumTerm		Limite à moyen terme de l'agence
BranchLongTerm		Limite à long terme de l'agence
BranchShortTerm		Limite à court terme de l'agence
VoltageHigh		Limite supérieure de tension
VoltageLow		Limite inférieure de tension

6.5.7.4 Énumération AnodeType

Types de nœuds agrégés, par exemple:

SYS – System Zone/Region (Zone/région système);

RUC – Zone RUC;

LFZ – Load Forecast Zone (Zone de prévision de charge);

REG – Région énergie/services auxiliaires du marché;

AGR – Aggregate Generation Resource (Ressource de production agrégée);

POD – Point of Delivery (Point de livraison);

ALR – Aggregate Load Resource (Ressource de charge agrégée);

LTAC – Load TransmissionAccessCharge (TAC) Group (Groupe de charge TransmissionAccessCharge);

ACA – Adjacent Control Area (Zone de réglage adjacente);

ASR – Aggregated System Resource (Ressource système agrégée);

ECA – Embedded Control Area (Zone de réglage embarquée).

Le Tableau 359 présente tous les libellés de AnodeType.

Tableau 359 – Libellés de MktDomain::AnodeType

libellé	valeur	description
SYS		Zone/région système
RUC		Zone RU
LFZ		Zone de prévision de charge
REG		Région énergie/services auxiliaires du marché
AGR		Ressource de production agrégée
POD		Point de livraison
ALR		Ressource de charge agrégée

libellé	valeur	description
LTAC		Groupe de charge TransmissionAccessCharge (TAC)
ACA		Zone de réglage adjacente
ASR		Ressource système agrégée
ECA		Zone de réglage embarquée
DER		Ressource d'énergie distribuée

6.5.7.5 Énumération ApnodeType

Types de nœuds agrégés, par exemple:

AG – Aggregated Generation (Production agrégée)

CPZ – Custom Price Zone (Zone de tarification personnalisée)

DPZ – Default Price Zone (Zone de tarification par défaut)

LAP – Load Aggregation Point (Point d'agrégation de charge)

TH – Trading Hub (Plate-forme de négociation)

SYS – System Zone (Zone système)

CA – Control Area (Zone de réglage)

GA – Generic Aggregation (Agrégation générique)

EHV – 500 kV

GH – Generic Hub (Plate-forme générique)

ZN – Zone

INT – Interface

BUS – Bus

Le Tableau 360 présente tous les libellés de ApnodeType.

Tableau 360 – Libellés de MktDomain::ApnodeType

libellé	valeur	description
AG		Production agrégée
CPZ		Zone de tarification personnalisée
DPZ		Zone de tarification par défaut
TH		Plate-forme de négociation
SYS		Zone système
CA		Zone de réglage
DCA		Zone de congestion désignée
GA		Agrégation générique
GH		Plate-forme générique
EHV		500 kV – Nœuds de tarification agrégés très haute tension
ZN		Zone
INT		Interface
BUS		Bus

6.5.7.6 Énumération AreaControlMode

Mode de contrôle actuel de la zone

Le Tableau 361 présente tous les libellés de AreaControlMode.

Tableau 361 – Libellés de MktDomain::AreaControlMode

libellé	valeur	description
CF		CF = Constant Frequency (Fréquence constante)
CTL		Ligne d'interconnexion constante
TLB		Conditionnement par ligne d'interconnexion
OFF		Contrôle d'arrêt

6.5.7.7 Énumération AutomaticDisplnstTypeCommitment

Types d'instructions des engagements.

Le Tableau 362 présente tous les libellés de AutomaticDisplnstTypeCommitment.

Tableau 362 – Libellés de MktDomain::AutomaticDisplnstTypeCommitment

libellé	valeur	description
START_UP		Type d'instruction de démarrage
SHUT_DOWN		Type d'instruction d'arrêt
DR_DEPLOY		Déploiement de la ressource distribuée
DR_RELEASE		Libération de la ressource distribuée
DR_ADJUSTMENT		Ajustement de la ressource distribuée pour une ressource distribuée déjà déployée (engagée).

6.5.7.8 Énumération AutomaticDispatchMode

Mode de répartition automatique

Le Tableau 363 présente tous les libellés de AutomaticDispatchMode.

Tableau 363 – Libellés de MktDomain::AutomaticDispatchMode

libellé	valeur	description
INTERVAL		
CONTINGENCY		Apparition d'une contingence, nouvelle répartition des réserves de contingence
MANUAL		Forçage par l'opérateur

6.5.7.9 Énumération BidCalculationBasis

La base est utilisée pour calculer la courbe du prix de l'offre pour une offre d'énergie par défaut.

Le Tableau 364 présente tous les libellés de BidCalculationBasis.

Tableau 364 – Libellés de MktDomain::BidCalculationBasis

libellé	valeur	description
LMP_BASED		Fondé sur les prix payés à un emplacement de tarification en particulier.
COST_BASED		Fondé sur les caractéristiques de production de l'unité et sur le coût du combustible.
NEGOTIATED		Montant négocié avec l'entité indépendante désignée.

6.5.7.10 Énumération BidMitigationStatus

Par exemple,

'S' – Atténuation par SMPM en cas de "faute"

'L' – Atténuation par LMPM en cas de "faute"

'R' – Modification par LMPM en raison des règles RMR

'M' – Atténuation en cas de "faute" par SMPM et LMPM

'B' – Atténuation en cas de "faute" par SMPM et modification par LMLM en raison des règles RMR

'O' – Original

Le Tableau 365 présente tous les libellés de BidMitigationStatus.

Tableau 365 – Libellés de MktDomain::BidMitigationStatus

libellé	valeur	description
S		
L		
R		
M		
B		
O		

6.5.7.11 Énumération BidMitigationType

Par exemple,

Initial

Final

Le Tableau 366 présente tous les libellés de BidMitigationType.

Tableau 366 – Libellés de MktDomain::BidMitigationType

libellé	valeur	description
I		
F		

6.5.7.12 Énumération BidType

Par exemple:

DEFAULT_ENERGY_BID

DEFAULT_STARTUP_BID

DEFAULT_MINIMUM_LOAD_BID

Le Tableau 367 présente tous les libellés de BidType.

Tableau 367 – Libellés de MktDomain::BidType

libellé	valeur	description
DEFAULT_ENERGY_BID		
DEFAULT_STARTUP_BID		
DEFAULT_MINIMUM_LOAD_BID		

6.5.7.13 Énumération BidTypeRMR

Le type de programmes automatiques d'offre présente deux types correspondant à la sortie exigée pour les exigences et la prérépartition qualifiée.

Le Tableau 368 présente tous les libellés de BidTypeRMR.

Tableau 368 – Libellés de MktDomain::BidTypeRMR

libellé	valeur	description
REQUIREMENTS		Type de programmes automatiques d'offre pour la prérépartition qualifiée.
QUALIFIED_PREDISPATCH		Type de programmes automatiques d'offre pour les exigences en sortie.

6.5.7.14 Énumération CRRCategoryType

Types de catégories de droits à revenu de congestion

Le Tableau 369 présente tous les libellés de CRRCategoryType.

Tableau 369 – Libellés de MktDomain::CRRCategoryType

libellé	valeur	description
NSR		Service réseau
PTP		Point à Point

6.5.7.15 Énumération CRRHedgeType

Types de couvertures des droits à revenu de congestion

Le Tableau 370 présente tous les libellés de CRRHedgeType.

Tableau 370 – Libellés de MktDomain::CRRHedgeType

libellé	valeur	description
OBLIGATION		
OPTION		

6.5.7.16 Énumération CRRRoleType

Types de rôles qu'une organisation peut jouer vis-à-vis d'un droit à revenu de congestion.

Le Tableau 371 présente tous les libellés de CRRRoleType.

Tableau 371 – Libellés de MktDomain::CRRRoleType

libellé	valeur	description
SELLER		
BUYER		
OWNER		

6.5.7.17 Énumération CRRSegmentType

Type de CRR, dans les définitions types possibles du système de CRR (par exemple, 'LSE', 'ETC').

Le Tableau 372 présente tous les libellés de CRRSegmentType.

Tableau 372 – Libellés de MktDomain::CRRSegmentType

libellé	valeur	description
AUC		
CAP		
CF		
CVR		Droits convertis.
ETC		Contrat de transport existant.
LSE		Société d'approvisionnement.
MT		Transport commercial.
TOR		Droits de propriété de transport.

6.5.7.18 Énumération CheckOutType

Pour indiquer un type de vérification tel que la capacité ajustée ou la capacité de répartition

Le Tableau 373 présente tous les libellés de CheckOutType.

Tableau 373 – Libellés de MktDomain::CheckOutType

libellé	valeur	description
PRE_HOUR		
PRE_SCHEDULE		
AFTER_THE_FACT		

6.5.7.19 Énumération CommitmentType

Par exemple:

SELF – Engagement volontaire

ISO – Nouvel engagement pour cette période de marché

UC – Engagement existant qui était un vestige d'un précédent marché.

Le Tableau 374 présente tous les libellés de CommitmentType.

Tableau 374 – Libellés de MktDomain::CommitmentType

libellé	valeur	description
SELF		
ISO		
UC		

6.5.7.20 Énumération ConstraintLimitType

Type de limite des résultats des contraintes avec obligation, par exemple:

MAXIMUM

MINIMUM

Le Tableau 375 présente tous les libellés de ConstraintLimitType.

Tableau 375 – Libellés de MktDomain::ConstraintLimitType

libellé	valeur	description
MAXIMUM		
MINIMUM		

6.5.7.21 Énumération ConstraintRampType

Type de rampe de contrainte

Le Tableau 376 présente tous les libellés de ConstraintRampType.

Tableau 376 – Libellés de MktDomain::ConstraintRampType

libellé	valeur	description
FAST		
SLOW		

6.5.7.22 Énumération ContractType

Type de contrat de transport, par exemple:

O – Autre

TE- Transmission Export (Export de transport)

TI – Transmission Import (Import de transport)

ETC – Existing Transmission Contract (Contrat de transport existant)

RMT – Contrat RMT

TOR – Transmission Ownership Right (Droit de propriété de transport)

RMR – Contrat RMR (Reliability Must Run)

CVR – Contrat converti.

Le Tableau 377 présente tous les libellés de ContractType.

Tableau 377 – Libellés de MktDomain::ContractType

libellé	valeur	description
ETC		ETC – Contrat de transport existant
TOR		TOR – Droit de propriété de transport
RMR		RMR – Contrat RMR
RMT		RMT – Contrat RMT
O		O – Autre
TE		TE – Export de transport
TI		TI – Import de transport
CVR		CVR – Contrat converti

6.5.7.23 Énumération CostBasis

Par exemple:

Bid Cost (Coût de l'offre)

Proxy Cost (Coût du proxy)

Registered Cost (Coût enregistré)

Le Tableau 378 présente tous les libellés de CostBasis.

Tableau 378 – Libellés de MktDomain::CostBasis

libellé	valeur	description
BIDC		
PRXC		
REGC		

6.5.7.24 Énumération DispatchResponseType

Par exemple:

NON_RESPONSE

ACCEPT

DECLINE

PARTIAL.

Le Tableau 379 présente tous les libellés de DispatchResponseType.

Tableau 379 – Libellés de MktDomain::DispatchResponseType

libellé	valeur	description
NON_RESPONSE		
ACCEPT		
DECLINE		
PARTIAL		

6.5.7.25 Énumération EnergyPriceIndexType

Par exemple:

WHOLESALE

RETAIL

BOTH

Le Tableau 380 présente tous les libellés de EnergyPriceIndexType.

Tableau 380 – Libellés de MktDomain::EnergyPriceIndexType

libellé	valeur	description
WHOLESALE		
RETAIL		
BOTH		

6.5.7.26 Énumération EnergyProductType

Type de produit énergétique

Le Tableau 381 présente tous les libellés de EnergyProductType.

Tableau 381 – Libellés de MktDomain::EnergyProductType

libellé	valeur	description
FIRM		Ferme
NFRM		Non ferme
DYN		Dynamique
WHL		Transit

6.5.7.27 Énumération EquipmentStatusType

Statut de l'équipement

Le Tableau 382 présente tous les libellés de EquipmentStatusType.

Tableau 382 – Libellés de MktDomain::EquipmentStatusType

libellé	valeur	description
In		L'équipement est en marche.
Out		L'équipement n'est pas en marche.

6.5.7.28 Énumération EnergyTransactionType

Définit l'état d'une transaction.

Le Tableau 383 présente tous les libellés de EnergyTransactionType.

Tableau 383 – Libellés de MktDomain::EnergyTransactionType

libellé	valeur	description
approve		Approbation
deny		Négation
study		Étude

6.5.7.29 Énumération ExecutionType

Types d'exécutions des processus de marché

Le Tableau 384 présente tous les libellés de ExecutionType.

Tableau 384 – Libellés de MktDomain::ExecutionType

libellé	valeur	description
DA		J-1
HASP		Exécution à H-1 en temps réel
RTPD		Prérépartition en temps réel
RTD		Répartition en temps réel

6.5.7.30 Énumération FlagTypeRMR

Indique si l'unité est de type RMR et son type de condition, par exemple:

'N' – l'unité n'est pas de type RMR

'1' – Unité RMR de condition 1

'2' – Unité RMR de condition 2

Le Tableau 385 présente tous les libellés de FlagTypeRMR.

Tableau 385 – Libellés de MktDomain::FlagTypeRMR

libellé	valeur	description
N		'N' – L'unité n'est pas de type RMR
1		'1' – Unité RMR de condition 1
2		'2' – Unité RMR de condition 2

6.5.7.31 Énumération FlowDirectionType

Indique le sens du flux d'énergie dans la Flowgate.

Le Tableau 386 présente tous les libellés de FlowDirectionType.

Tableau 386 – Libellés de MktDomain::FlowDirectionType

libellé	valeur	description
Forward		Le flux va dans le sens aval.
Reverse		Le flux va dans le sens amont.

6.5.7.32 Énumération FuelSource

Par exemple:

Bio Gas (décharge, eaux usées, digesteur, etc.)

Biomass (Biomasse)

Coal (Charbon)

DIST

Natural Gas (Gaz naturel)

Geothermal (Énergie géothermique)

HRCV

None (Aucun)

Nuclear (Énergie nucléaire)

Oil (Pétrole)

Other (Autre)

Solar (Énergie solaire)

Waste to Energy (Transformation des déchets en énergie)

Water (Énergie hydraulique)

Wind (Énergie éolienne)

Le Tableau 387 présente tous les libellés de FuelSource.

Tableau 387 – Libellés de MktDomain::FuelSource

libellé	valeur	description
NG		Gaz naturel
NNG		Gaz non naturel
BGAS		Biogaz (décharge, eaux usées, digesteur, etc.)
BIOM		Biomasse
COAL		Charbon
DIST		
GAS		
GEOT		Énergie géothermique
HRCV		
NONE		aucun
NUCL		Énergie nucléaire
OIL		Pétrole
OTHR		Autre
SOLR		Énergie solaire
WAST		Transformation des déchets en énergie
WATR		Énergie hydraulique
WIND		Énergie éolienne

6.5.7.33 Énumération InterTieDirection

Sens d'une ligne d'interconnexion.

Le Tableau 388 présente tous les libellés de InterTieDirection.

Tableau 388 – Libellés de MktDomain::InterTieDirection

libellé	valeur	description
E		Exportation.
.I		Importation.

6.5.7.34 Énumération LoadForecastType

Types de zones de prévision de charge.

Le Tableau 389 présente tous les libellés de LoadForecastType.

Tableau 389 – Libellés de MktDomain::LoadForecastType

libellé	valeur	description
LFZ		Zone de prévision de charge.
LZMS		Zone du sous-système mesuré.

6.5.7.35 Énumération MPMTestIdentifierType

Type d'identifiant d'essai d'atténuation de l'emprise sur le marché, par exemple:

- 1 – Essai de tarification globale
- 2 – Essai de conductivité globale
- 3 – Essai d'impact global
- 4 – Essai de tarification locale
- 5 – Essai de conductivité locale
- 6 – Essai d'impact local

Le Tableau 390 présente tous les libellés de MPMTestIdentifierType.

Tableau 390 – Libellés de MktDomain::MPMTestIdentifierType

libellé	valeur	description
1		1 – Essai de tarification globale.
2		2 – Essai de conductivité globale.
3		3 – Essai d'impact global.
4		4 – Essai de tarification locale.
5		5 – Essai de conductivité locale.
6		6 – Essai d'impact local.

6.5.7.36 Énumération MPMTestMethodType

Type de méthode d'essai d'atténuation d'emprise sur le marché.

Essais avec les seuils normalisés (par défaut) ou essais avec les seuils alternatifs.

Le Tableau 391 présente tous les libellés de MPMTestMethodType.

Tableau 391 – Libellés de MktDomain::MPMTestMethodType

libellé	valeur	description
NORMAL		Normal.
ALTERNATE		Alternatif.

6.5.7.37 Énumération MPMTestOutcome

Par exemple:

Passed (Succès)

Failed (Échec)

Disabled (Désactivé)

Skipped (Ignoré)

Le Tableau 392 présente tous les libellés de MPMTestOutcome.

Tableau 392 – Libellés de MktDomain::MPMTestOutcome

libellé	valeur	description
P		Succès
F		Échec
D		Désactivé
S		Ignoré

6.5.7.38 Énumération MQSCHGType

Par exemple:

ADD – ajouter

CHG – modifier

Le Tableau 393 présente tous les libellés de MQSCHGType.

Tableau 393 – Libellés de MktDomain::MQSCHGType

libellé	valeur	description
ADD		
CHG		

6.5.7.39 Énumération MQSInstructionSource

Valeurs valides, par exemple:

INS – Instruction de RTM

ACT – Instruction réelle après les faits

Le Tableau 394 présente tous les libellés de MQSInstructionSource.

Tableau 394 – Libellés de MktDomain::MQSInstructionSource

libellé	valeur	description
INS		
ACT		

6.5.7.40 Énumération MarketEventStatusKind

Types de statuts des événements du marché.

Le Tableau 395 présente tous les libellés de MarketEventStatusKind.

Tableau 395 – Libellés de MktDomain::MarketEventStatusKind

libellé	valeur	description
active		Le statut de l'événement est actuellement dans un état actif. Actif (lorsque sysdate est supérieure ou égale à l'heure de début planifiée)
cancelled		Le statut de l'événement est actuellement dans un état annulé. Annulé (arrêté avant l'heure de début planifiée ou l'heure de fin planifiée)
completed		Le statut de l'événement est actuellement dans un état terminé. Terminé (lorsque sysdate est égale à l'heure de libération)
planned		Le statut de l'événement est actuellement dans un état planifié. Planifié (sysdate est inférieure à l'heure de début planifiée)

6.5.7.41 Énumération MarketProductSelfSchedType

Types d'offres à programmation automatique de produits du marché

Le Tableau 396 présente tous les libellés de MarketProductSelfSchedType.

Tableau 396 – Libellés de MktDomain::MarketProductSelfSchedType

libellé	valeur	description
ETC		Contrat de transport existant.
TOR		Droit de propriété de transport.
RMR		Marche obligatoire (must run) pour fiabilité
RGMR		Marche obligatoire (must run) pour régulation
RMT		Prise obligatoire (must take) pour fiabilité
PT		Preneur de prix.
LPT		Preneur de prix inférieur.
SP		Alimentation automatique.
RA		Adéquation de la ressource.

6.5.7.42 Énumération MarketProductType

Par exemple:

Énergie, régulation à la hausse, régulation à la baisse, réserve tournante, réserve non tournante, RUC, suivi de charge (ascendant et descendant).

Le Tableau 397 présente tous les libellés de MarketProductType.

Tableau 397 – Libellés de MktDomain::MarketProductType

libellé	valeur	description
EN		Type d'énergie
RU		Régulation à la hausse
RD		Régulation à la baisse
SR		Réserve tournante
NR		Réserve non tournante
RC		Engagement de l'unité résiduelle
LFU		Suivi de charge ascendant
LFD		Suivi de charge descendant
REG		Régulation

6.5.7.43 Énumération MarketType

Type de marché.

Le Tableau 398 présente tous les libellés de MarketType.

Tableau 398 – Libellés de MktDomain::MarketType

libellé	valeur	description
DAM		Marché à J-1
RTM		Marché en temps réel
HAM		Marché à H-1
RUC		Engagement de l'unité résiduelle.

6.5.7.44 Énumération MktAccountKind

Type de compte de marché.

Le Tableau 399 présente tous les libellés de MktAccountKind.

Tableau 399 – Libellés de MktDomain::MktAccountKind

libellé	valeur	description
normal		
reversal		
statistical		
estimate		

6.5.7.45 Énumération MktBillMediaKind

Type de support de facturation.

Le Tableau 400 présente tous les libellés de MktBillMediaKind.

Tableau 400 – Libellés de MktDomain::MktBillMediaKind

libellé	valeur	description
paper		
electronic		
other		

6.5.7.46 Énumération MktInvoiceLineItemKind

Type d'élément de ligne de facturation.

Le Tableau 401 présente tous les libellés de MktInvoiceLineItemKind.

Tableau 401 – Libellés de MktDomain::MktInvoiceLineItemKind

libellé	valeur	description
initial		
recalculation		
other		

6.5.7.47 Énumération OnOff

ON

OFF

Le Tableau 402 présente tous les libellés de OnOff.

Tableau 402 – Libellés de MktDomain::OnOff

libellé	valeur	description
ON		
OFF		

6.5.7.48 Énumération ParticipationCategoryMPM

Par exemple:

'Y' – Participe à LMPM et à SMPM

'N' – N'est pas inclus dans les mesures de tarification LMP

'S' – Participe aux mesures de tarification SMPM

'L' – Participe aux mesures de tarification LMPM

Le Tableau 403 présente tous les libellés de ParticipationCategoryMPM.

Tableau 403 – Libellés de MktDomain::ParticipationCategoryMPM

libellé	valeur	description
Y		
N		
S		
L		

6.5.7.49 Énumération PassIndicatorType

Définit les acceptations individuelles qui produisent des résultats par type d'exécution/type de marché.

Le Tableau 404 présente tous les libellés de PassIndicatorType.

Tableau 404 – Libellés de MktDomain::PassIndicatorType

libellé	valeur	description
MPM-1		Acceptation de l'atténuation de l'emprise sur le marché 1
MPM-2		Acceptation de l'atténuation de l'emprise sur le marché 2
MPM-3		Acceptation de l'atténuation de l'emprise sur le marché 3
MPM-4		Acceptation de l'atténuation de l'emprise sur le marché 4
RUC		Engagement de l'unité résiduelle
RTPD		Prérépartition en temps réel
RTED		Répartition économique en temps réel
HA-SCUC		Engagement d'unité à contrainte de sécurité à H-1
DA		J-1

6.5.7.50 Énumération PriceTypeKind

La valeur de cette énumération pour différents prix est "total" pour le prix complet/fort/global price, "congestion" pour le coût de congestion associé au prix total, "loss" pour le prix-réclame associé au prix total, "capacity" pour les prix relatifs à la capacité installée ou réservée, "mileage" pour la comptabilité en fonction de l'utilisation, "system" pour les prix relatifs au système global/plaque de cuivre, et "delivery" pour les prix relatifs à la distribution.

Le Tableau 405 présente tous les libellés de PriceTypeKind.

Tableau 405 – Libellés de MktDomain::PriceTypeKind

libellé	valeur	description
capacity		
congestion		
delivery		
loss		
mileage		
system		
total		

6.5.7.51 Énumération PurposeFlagType

Indicateur d'objectif MPM, par exemple:

Nature des données de seuil:

'M' – Seuil d'atténuation

'R' – Seuil de rapport

Le Tableau 406 présente tous les libellés de PurposeFlagType.

Tableau 406 – Libellés de MktDomain::PurposeFlagType

libellé	valeur	description
M		
R		

6.5.7.52 Énumération RampCurveType

Par exemple:

0 – Taux de rampe fixe indépendant de la fonction de taux de la sortie MW de l'unité

1 – Taux de rampe statiques comme fonction de la sortie MW de l'unité uniquement

2 – Taux de rampe dynamiques comme fonction de la sortie MW de l'unité et du temps de rampe

Le Tableau 407 présente tous les libellés de RampCurveType.

Tableau 407 – Libellés de MktDomain::RampCurveType

libellé	valeur	description
0		Taux de rampe fixe indépendant de la fonction de taux de la sortie MW de l'unité
1		Taux de rampe statiques comme fonction de la sortie MW de l'unité uniquement
2		Taux de rampe dynamiques comme fonction de la sortie MW de l'unité et du temps de rampe

6.5.7.53 Énumération RampRateCondition

Condition du taux de rampe

Le Tableau 408 présente tous les libellés de RampRateCondition.

Tableau 408 – Libellés de MktDomain::RampRateCondition

libellé	valeur	description
WORST		
BEST		
NORMAL		
NA		Non applicable

6.5.7.54 Énumération RampRateType

Type de courbe du taux de rampe.

Le Tableau 409 présente tous les libellés de RampRateType.

Tableau 409 – Libellés de MktDomain::RampRateType

libellé	valeur	description
OP		Taux de rampe opérationnel.
REG		Taux de rampe régulateur.
OP_RES		Taux de rampe opérationnel de réserve.
LD_DROP		Taux de rampe de chute de charge.
LD_PICKUP		Taux de reprise de charge.
INTERTIE		Taux de rampe de la ligne d'interconnexion.

6.5.7.55 Énumération ReserveRequirementType

Par exemple:

Réserve d'exploitation, régulation, contingence

Le Tableau 410 présente tous les libellés de ReserveRequirementType.

Tableau 410 – Libellés de MktDomain::ReserveRequirementType

libellé	valeur	description
OPRSV		Reserve d'exploitation
CONT		Contingence
REG		Régulation

6.5.7.56 Énumération ResourceAssnType

Par exemple:

Indicateur de puits de propriétaire d'actifs pour utilisation par CRR

Indicateur de source de propriétaire d'actifs pour utilisation par CRR

Marche obligatoire pour fiabilité

Coordinateur de programmation

Société d'approvisionnement

Le Tableau 411 présente tous les libellés de ResourceAssnType.

Tableau 411 – Libellés de MktDomain::ResourceAssnType

libellé	valeur	description
CSNK		
CSRC		
RMR		
SC		
LSE		

6.5.7.57 Énumération ResourceCapacityType

Type de capacité de la ressource.

Le Tableau 412 présente tous les libellés de ResourceCapacityType.

Tableau 412 – Libellés de MktDomain::ResourceCapacityType

libellé	valeur	description
RU		Régulation à la hausse.
RD		Régulation à la baisse.
SR		Réserve tournante.
NR		Réserve non tournante.
MO		Offre obligatoire (must offer).
FO		Offre flexible.
RA		Adéquation de la ressource.
RMR		Marche obligatoire pour fiabilité.

6.5.7.58 Énumération ResourceCertificationKind

Types utilisés pour la certification des ressources.

Le Tableau 413 présente tous les libellés de ResourceCertificationKind.

Tableau 413 – Libellés de MktDomain::ResourceCertificationKind

libellé	valeur	description
RegulationUp		Régulation à la hausse (RU, REGUP)
RegulationDown		Régulation à la baisse (RD, REGDN)
SpinningReserve		Réserve tournante (SR, RRSPIN)
NonSpinningReserve		Réserve non tournante (NR, NONSPIN)
ReliabilityMustRun		Marche obligatoire pour fiabilité (RMR)
BLACKSTART		Démarrage en autonome
DemandSideResponse		Réponse côté demande (DSR)
SynchronousCondenser		Compensateur synchrone (SYNCCOND)
IntermittentResource		Ressource intermittente
ReliabilityUnitCommitment		Engagement d'unité pour fiabilité (RUC)
Energy		
Capacity		

6.5.7.59 Énumération ResourceLimitIndicator

Indicateurs AS locaux révélant si la limite supérieure ou inférieure de l'approvisionnement régional AS est contraignante.

Le Tableau 414 présente tous les libellés de ResourceLimitIndicator.

Tableau 414 – Libellés de MktDomain::ResourceLimitIndicator

libellé	valeur	description
UPPER		
LOWER		

6.5.7.60 Énumération ResourceRegistrationStatus

Type de statut d'enregistrement de la ressource, par exemple:

Active (actif)

Mothballed (suspendu)

Planned (planifié)

Decommissioned (mis hors service)

Le Tableau 415 présente tous les libellés de ResourceRegistrationStatus.

Tableau 415 – Libellés de MktDomain::ResourceRegistrationStatus

libellé	valeur	description
Active		L'enregistrement de la ressource est actif
Planned		Le statut d'enregistrement est en phase de planification
Mothballed		L'enregistrement de la ressource a été suspendu
Decommissioned		Le statut d'enregistrement de la ressource est mis hors service

6.5.7.61 Énumération ResultsConstraintType

Types de contraintes avec obligation des résultats du marché.

Le Tableau 416 présente tous les libellés de ResultsConstraintType.

Tableau 416 – Libellés de MktDomain::ResultsConstraintType

libellé	valeur	description
FG_act		Scénario de base réel de l'interface de transit.
Contingency		Contingence.
Interface		Interface.
Actual		Réel.

6.5.7.62 Énumération SelfSchedReferenceType

Indication sur le type de programme automatique en cours de référencement.

Le Tableau 417 présente tous les libellés de SelfSchedReferenceType.

Tableau 417 – Libellés de MktDomain::SelfSchedReferenceType

libellé	valeur	description
ETC		Contrat de transport existant.
TOR		Droit de propriété de transport.

6.5.7.63 Énumération SelfScheduleBreakdownType

Type de panne à programmation automatique.

Le Tableau 418 présente tous les libellés de SelfScheduleBreakdownType.

Tableau 418 – Libellés de MktDomain::SelfScheduleBreakdownType

libellé	valeur	description
ETC		Contrat de transport existant.
TOR		Droit de propriété de transport.
LPT		Preneur de prix inférieur.

6.5.7.64 Énumération SwitchStatusType

Statut du disjoncteur (fermé ou ouvert).

Le Tableau 419 présente tous les libellés de SwitchStatusType.

Tableau 419 – Libellés de MktDomain::SwitchStatusType

libellé	valeur	description
Closed		Statut fermé.
Open		Statut ouvert.

6.5.7.65 Énumération TRType

Type de droit de contrat de transport, par exemple:

droits de contrats individuels ou en chaîne

Le Tableau 420 présente tous les libellés de TRType.

Tableau 420 – Libellés de MktDomain::TRType

libellé	valeur	description
CHAIN		Chaîne TR
INDIVIDUAL		TR individuel

6.5.7.66 Énumération TimeOfUse

Temps d'utilisation utilisé par une définition CRR pour la spécification de la durée d'étendue CRR. ON – La CRR s'étend sur les heures de pointe de la journée, OFF – La CRR s'étend sur les heures creuses de la journée, 24HR – La CRR s'étend sur toute la journée.

Le Tableau 421 présente tous les libellés de TimeOfUse.

Tableau 421 – Libellés de MktDomain::TimeOfUse

libellé	valeur	description
ON		Le temps d'utilisation s'étend uniquement sur les heures de pointe de la journée.
OFF		Le temps d'utilisation s'étend uniquement sur les heures creuses de la journée.
24HR		Le temps d'utilisation s'étend sur toute la journée, soit 24 h.

6.5.7.67 Énumération TradeType

Type d'opération.

Le Tableau 422 présente tous les libellés de TradeType.

Tableau 422 – Libellés de MktDomain::TradeType

libellé	valeur	description
IST		Opération InterSC.
AST		Opération commerciale relative aux services auxiliaires.
UCT		Opération commerciale d'engagement d'unité.

6.5.7.68 Énumération UnitRegulationKind

Type de régulation d'unité.

Le Tableau 423 présente tous les libellés de UnitRegulationKind.

Tableau 423 – Libellés de MktDomain::UnitRegulationKind

libellé	valeur	description
0		L'unité n'est pas en régulation.
1		L'unité est en AGC et en régulation.
2		L'unité est censée être en régulation, mais ne l'est pas actuellement.

6.5.7.69 Énumération UnitType

Combined Cycle (cycle combiné)

Gas Turbine (turbine à gaz)

Hydro Turbine (turbine hydraulique)

Other (autre)

Photovoltaic (photovoltaïque)

Hydro Pump-Turbine (turbine à pompe hydraulique)

Reciprocating Engine (moteur à explosion)

Steam Turbine (turbine à vapeur)

Synchronous Condenser (compensateur synchrone)

Wind Turbine (éolienne)

Le Tableau 424 présente tous les libellés de UnitType.

Tableau 424 – Libellés de MktDomain::UnitType

libellé	valeur	description
CCYC		Cycle combiné
GTUR		Turbine à gaz
HYDR		Turbine hydraulique
OTHR		Autre
PHOT		Photovoltaïque
PTUR		Turbine à pompe hydraulique
RECP		Moteur à explosion
STUR		Turbine à vapeur
SYNC		Compensateur synchrone
WIND		Éolienne

6.5.7.70 Énumération YesNo

Utilisée comme indicateur défini sur Yes (Oui) ou No (Non).

Le Tableau 425 présente tous les libellés de YesNo.

Tableau 425 – Libellés de MktDomain::YesNo

libellé	valeur	description
YES		
NO		

6.5.8 Paquetage ParticipantInterfaces

6.5.8.1 Généralités

Interfaces des participants du marché pour les offres et les échanges commerciaux.

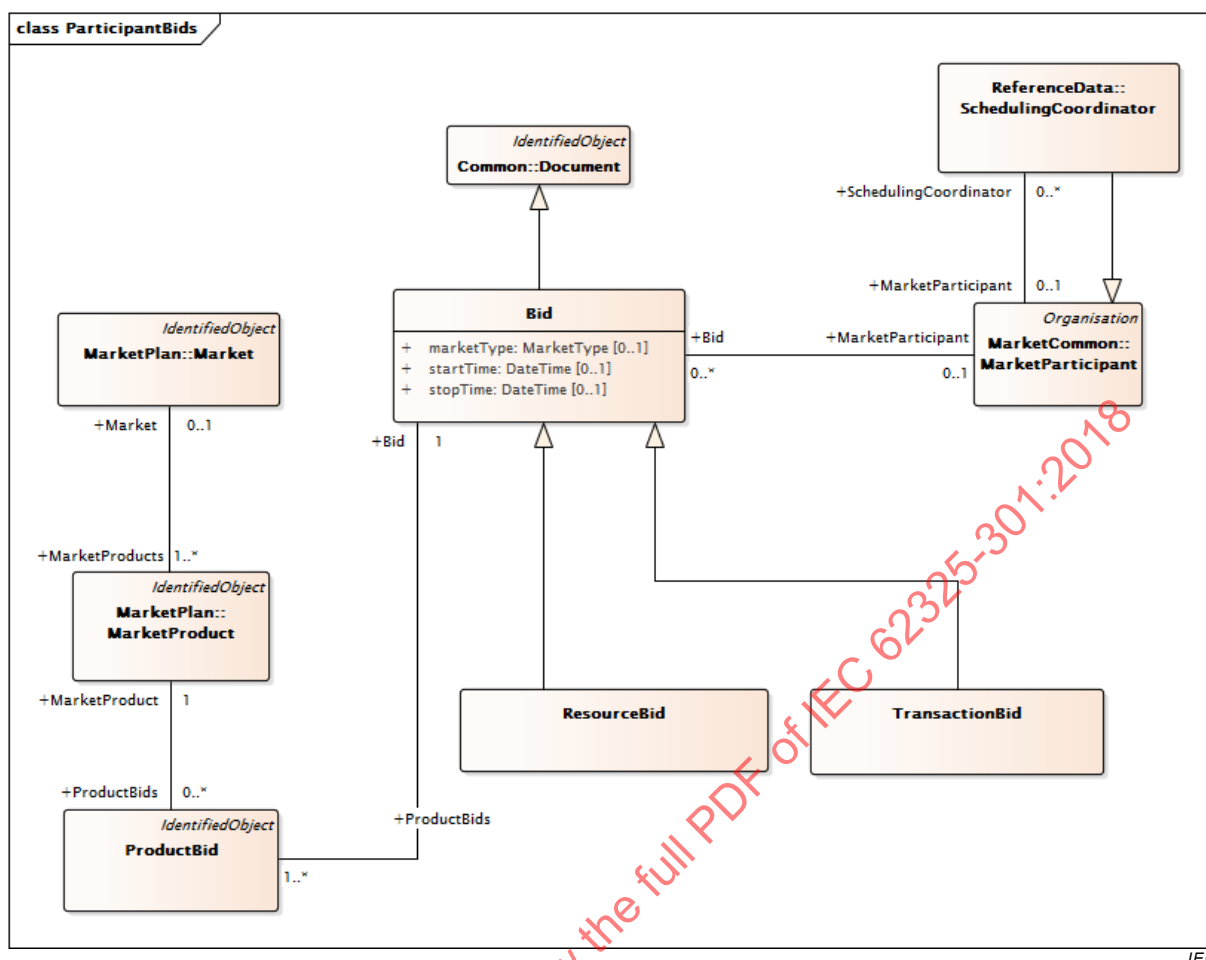
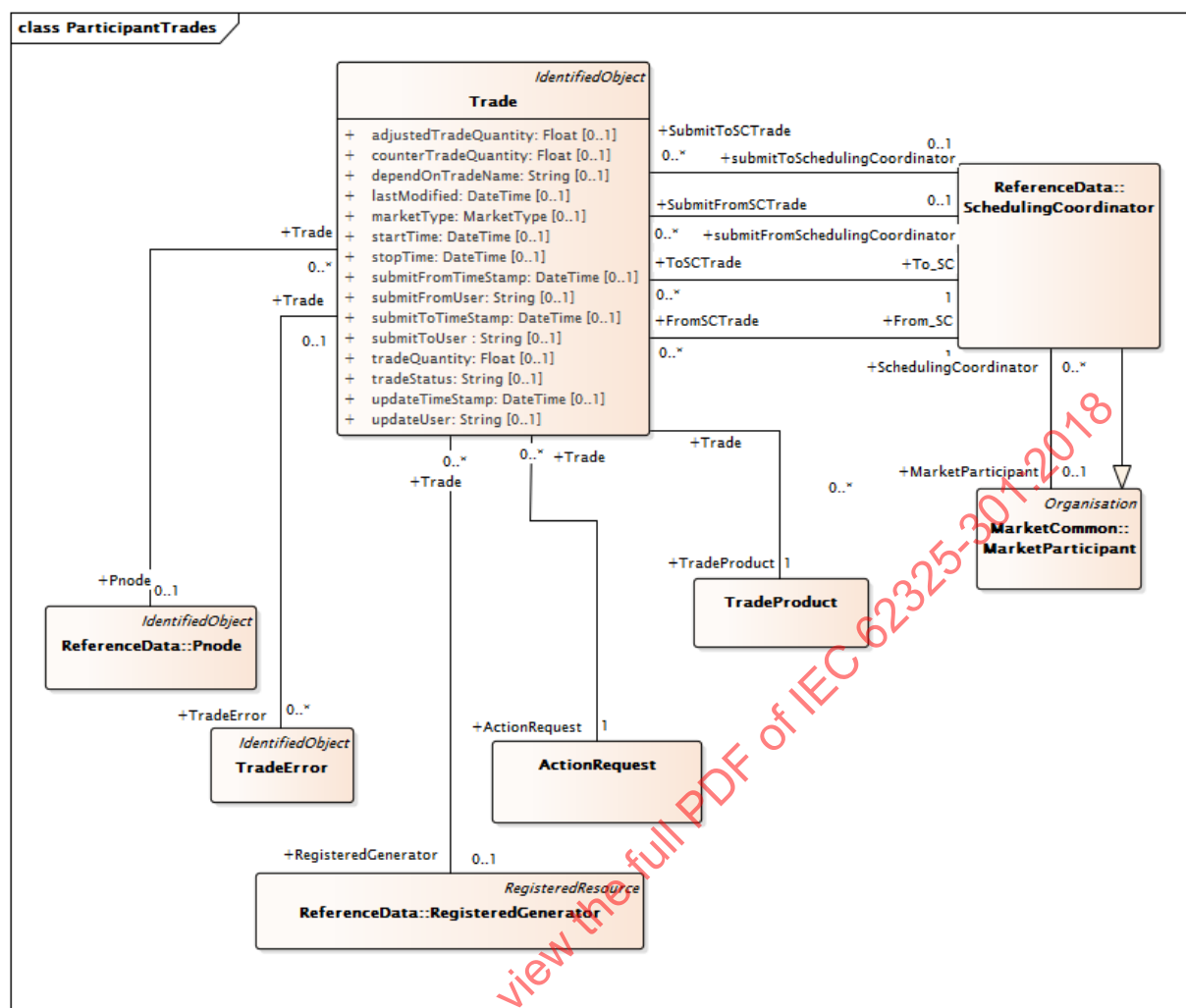


Figure 54 – Diagramme de classe ParticipantInterfaces::ParticipantBids

Figure 54: représente une vue générale de la classe et des associations qui sont utilisées pour modéliser les offres et les enchères. Le terme "Offre" (*Bid*) inclut les offres de vente et d'achat d'un ou plusieurs produits d'électricité. Bid est une sous-classe de la classe Document du paquetage IEC 61968. Les Bid sont elles-mêmes classées en ResourceBid et TransactionBid. Les enchères sont associées aux coordinateurs de programmation qui les soumet au nom des participants du marché, comme l'indique l'association entre la classe Bid et la classe SchedulingCoordinator.



IEC

Figure 55 – Diagramme de classe ParticipantInterfaces::ParticipantTrades

Figure 55: représente la classe et les associations utilisées pour modéliser les opérations financières entre coordinateurs de programmation. La classe TradeProduct est utilisée pour indiquer le produit électrique inclus dans l'opération. La classe SchedulingCoordinator est utilisée pour indiquer les coordinateurs de programmation impliqués dans l'opération.

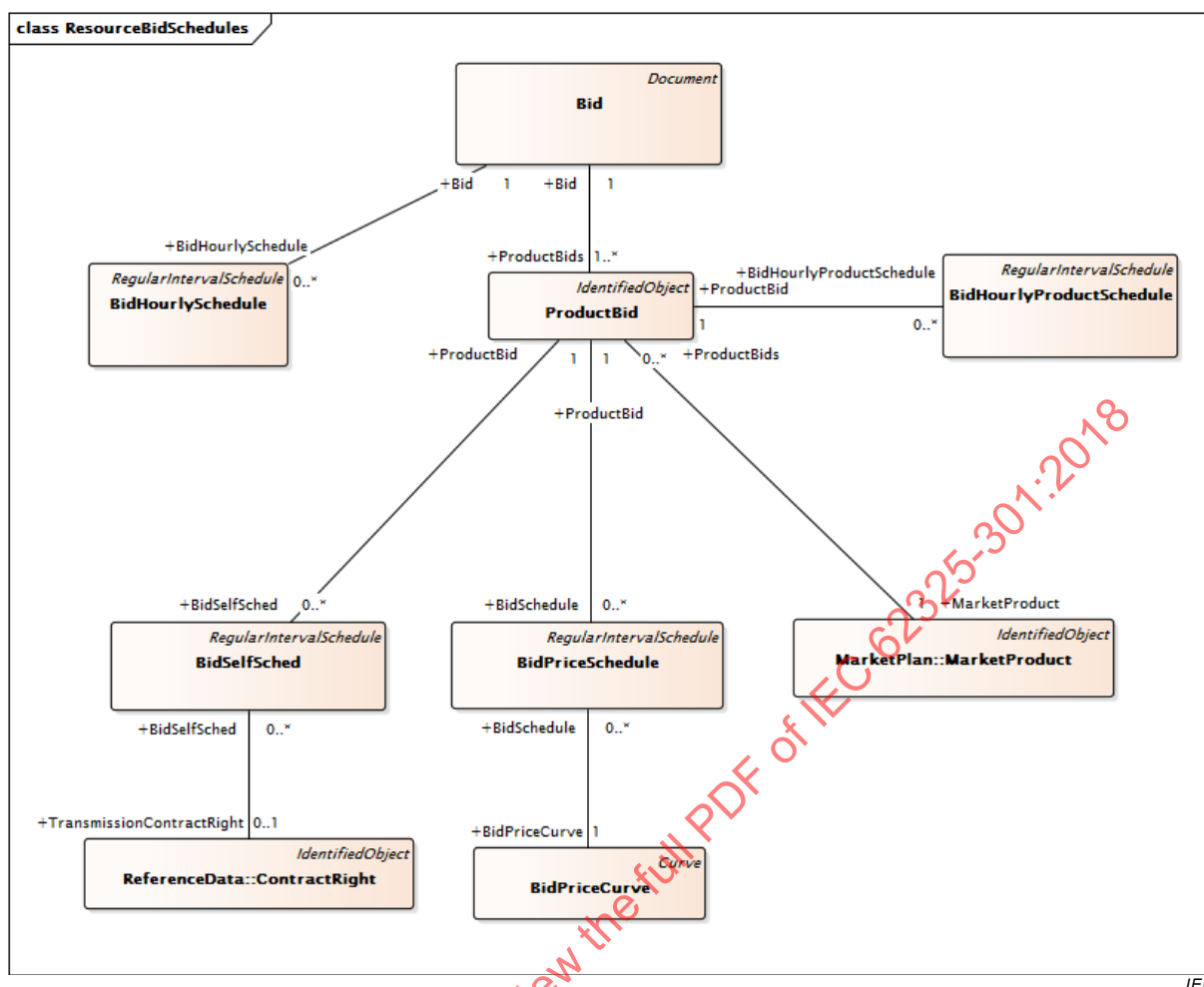


Figure 56 – Diagramme de classe ParticipantInterfaces::ResourceBidSchedules

Figure 56: représente les classes et les associations utilisées pour modéliser les programmations d'offres. Un coordinateur de programmation peut décider de soumettre une offre valide pour plusieurs intervalles de l'horizon temporel du marché. Les classes de ce modèle prennent en charge ce concept.

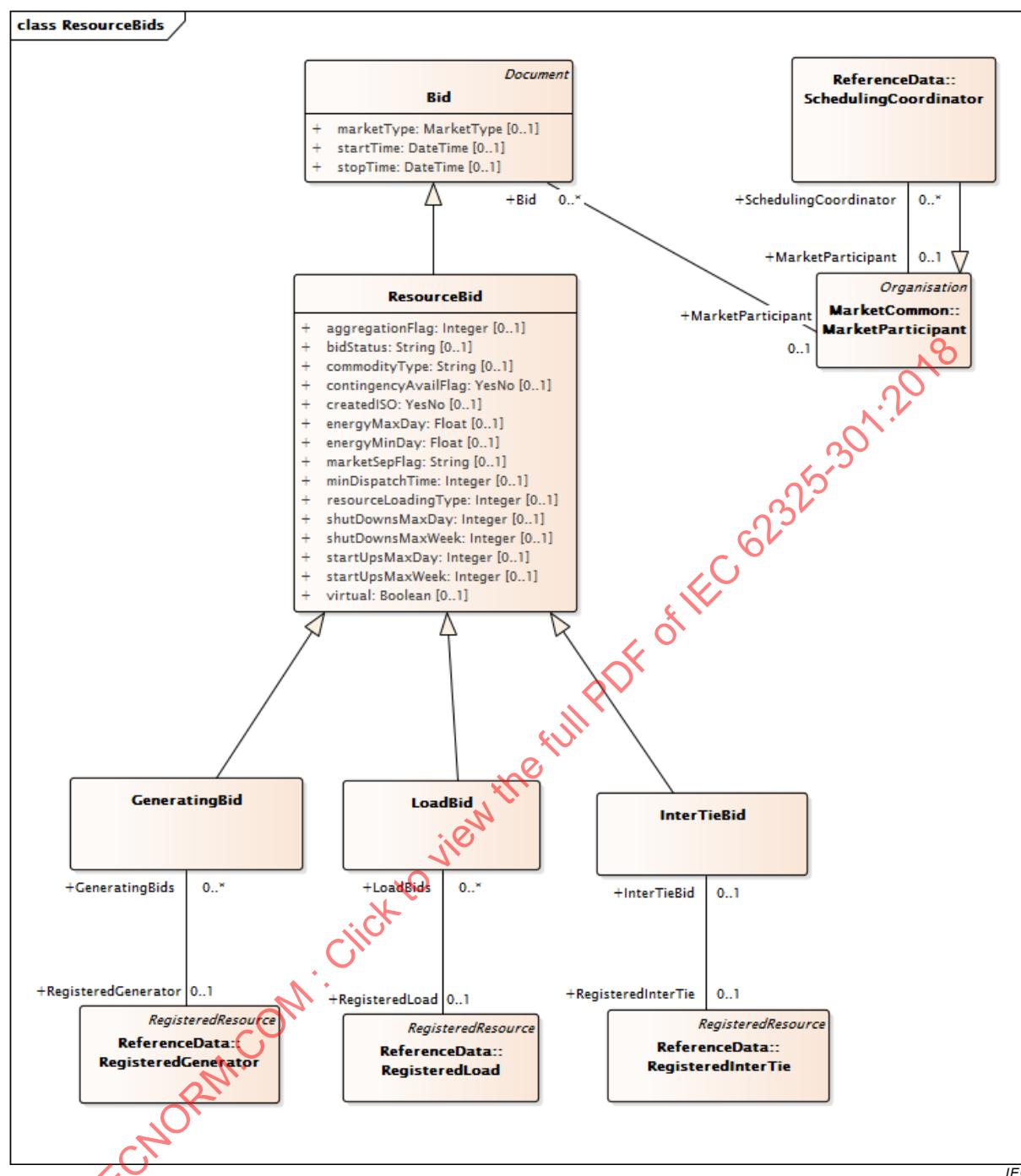


Figure 57 – Diagramme de classe ParticipantInterfaces::ResourceBids

Figure 57: représente les classes et les associations utilisées pour modéliser les offres de ressources. Le modèle d'offre de ressource comprend les sous-classes GeneratingBid, LoadBid et IntertieBid pour modéliser les relations avec les classes ResourceBid et Bid.

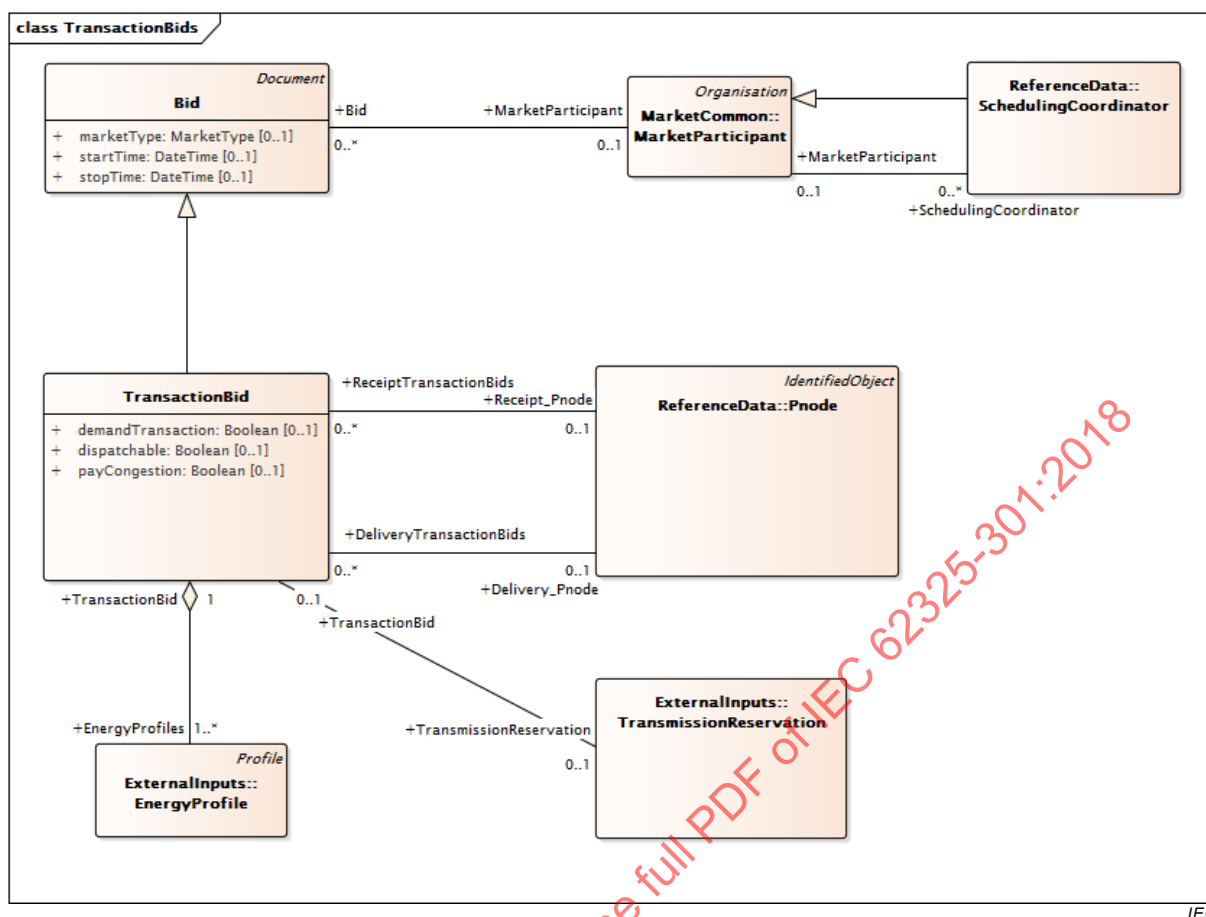


Figure 58 – Diagramme de classe ParticipantInterfaces::TransactionBids

Figure 58: représente les classes et les associations utilisées pour modéliser les offres de transactions. Le modèle TransactionBid intègre les sous-classes GeneratingBid, LoadBid et IntertieBid pour modéliser les relations avec les classes ResourceBid et Bid.

6.5.8.2 Classe racine ActionRequest

Requête d'action par rapport à une opération existante.

Le Tableau 426 présente tous les attributs de ActionRequest.

Tableau 426 – Attributs de ParticipantInterfaces::ActionRequest

nom	mult	type	description
actionName	0..1	ActionType	Type de nom d'action pour la requête d'action.

Le Tableau 427 présente toutes les extrémités d'association de ActionRequest avec d'autres classes.

Tableau 427 – Extrémités d'association de ParticipantInterfaces::ActionRequest avec d'autres classes

mult à partir de	nom	mult vers	type	description
1..1	Bid	0..*	Bid	
1..1	Trade	0..*	Trade	

6.5.8.3 AreaLoadBid

AreaLoadBid n'est pas soumise aux marchés par un participant de marché. À la place, elle consiste simplement en une agrégation de toutes les LoadBids contenues dans une SubControlArea spécifique. Il convient de faire en sorte que cette entité hérite de Bid pour la représentation du cadre temporel (startTime, stopTime) et du type de marché.

Le Tableau 428 présente tous les attributs de AreaLoadBid.

Tableau 428 – Attributs de ParticipantInterfaces::AreaLoadBid

nom	mult	type	description
demandBidMW	0..1	Float	Quantité de Mégawatts de l'offre de la demande pour la zone. Utilisation de l'attribut: Il s'agit de la quantité MW de la demande planifiée à J-1
startTime	0..1	DateTime	Hérité de: Bid
stopTime	0..1	DateTime	Hérité de: Bid
marketType	0..1	MarketType	Hérité de: Bid
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 429 présente toutes les extrémités d'association de AreaLoadBid avec d'autres classes.

Tableau 429 – Extrémités d'association de ParticipantInterfaces::AreaLoadBid avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..1	LoadBid	0..*	LoadBid	
0..*	MarketParticipant	0..1	MarketParticipant	Hérité de: Bid
0..*	EnergyMarket	1..1	EnergyMarket	Hérité de: Bid
0..1	ChargeProfiles	0..*	ChargeProfile	Hérité de: Bid
1..1	MitigatedBidSegment	0..*	MitigatedBidSegment	Hérité de: Bid
0..1	MitigatedBid	0..*	MitigatedBid	Hérité de: Bid
0..1	RMRDetermination	0..*	RMRDetermination	Hérité de: Bid
0..*	ActionRequest	1..1	ActionRequest	Hérité de: Bid
1..1	BidHourlySchedule	0..*	BidHourlySchedule	Hérité de: Bid
1..1	ProductBids	1..*	ProductBid	Hérité de: Bid
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document
0..*	Editor	0..1	Editor	Hérité de: Document
0..*	Approver	0..1	Approver	Hérité de: Document
0..*	Author	0..1	Author	Hérité de: Document
0..*	Issuer	0..1	Issuer	Hérité de: Document
0..1	DiagramObjects	0..*	DiagramObject	Hérité de: IdentifiedObject
1..1	Names	0..*	Name	Hérité de: IdentifiedObject
0..1	PropertiesCIMDataObject	0..1	DataSetMember	Hérité de: IdentifiedObject
1..1	TargetingCIMDataObject	0..*	DataSetMember	Hérité de: IdentifiedObject

6.5.8.4 Classe racine AttributeProperty

Propriété d'un attribut en particulier contenant le nom et la valeur

Le Tableau 430 présente tous les attributs de AttributeProperty.

Tableau 430 – Attributs de ParticipantInterfaces::AttributeProperty

nom	mult	type	description
sequence	0..1	String	
propertyName	0..1	String	
propertyValue	0..1	String	

Le Tableau 431 présente toutes les extrémités d'association de AttributeProperty avec d'autres classes.

Tableau 431 – Extrémités d'association de ParticipantInterfaces::AttributeProperty avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MktUserAttribute	1..1	MktUserAttribute	

6.5.8.5 Bid

Représente les offres d'achat et les offres de vente des services auxiliaires ou d'énergie dans un marché sponsorisé par un RTO.

Le Tableau 432 présente tous les attributs de Bid.

Tableau 432 – Attributs de ParticipantInterfaces::Bid

nom	mult	type	description
startTime	0..1	DateTime	Heure et date de début auxquelles s'applique l'offre.
stopTime	0..1	DateTime	Heure et date de fin auxquelles s'applique l'offre.
marketType	0..1	MarketType	Type de marché: DAM ou RTM.
type	0..1	String	Hérité de: Document
authorName	0..1	String	Hérité de: Document
createdDateTime	0..1	DateTime	Hérité de: Document
lastModifiedDateTime	0..1	DateTime	Hérité de: Document
revisionNumber	0..1	String	Hérité de: Document
electronicAddress	0..1	ElectronicAddress	Hérité de: Document
subject	0..1	String	Hérité de: Document
title	0..1	String	Hérité de: Document
docStatus	0..1	Status	Hérité de: Document
status	0..1	Status	Hérité de: Document
comment	0..1	String	Hérité de: Document
aliasName	0..1	String	Hérité de: IdentifiedObject
description	0..1	String	Hérité de: IdentifiedObject
mRID	0..1	String	Hérité de: IdentifiedObject
name	0..1	String	Hérité de: IdentifiedObject

Le Tableau 433 présente toutes les extrémités d'association de Bid avec d'autres classes.

Tableau 433 – Extrémités d'association de ParticipantInterfaces::Bid avec d'autres classes

mult à partir de	nom	mult vers	type	description
0..*	MarketParticipant	0..1	MarketParticipant	
0..*	EnergyMarket	1..1	EnergyMarket	
0..1	ChargeProfiles	0..*	ChargeProfile	
1..1	MitigatedBidSegment	0..*	MitigatedBidSegment	
0..1	MitigatedBid	0..*	MitigatedBid	
0..1	RMRDetermination	0..*	RMRDetermination	
0..*	ActionRequest	1..1	ActionRequest	
1..1	BidHourlySchedule	0..*	BidHourlySchedule	
1..1	ProductBids	1..*	ProductBid	Une offre comprend au moins une offre de produit pour les produits de marché.
0..1	ConfigurationEvents	0..*	ConfigurationEvent	Hérité de: Document