INTERNATIONAL STANDARD

ISO 13584-501

First edition
2007-02-01

Industrial automation systems and integration — Parts library —

Part 501: Reference dictionary for measuring instruments — Registration procedure

Systèmes d'automatisation industrielle et intégration — Bibliothèque de composants —

Partie 501: Dictionnaire de référence pour les instruments de mesure — Procédure d'enregistrement

Reference number
ISO 13584-501:2007(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Figures

Tables

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/ IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 13584 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13584-501 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC 4 *Industrial data*.

ISO 13584 consists of the following parts under the general title *Industrial automation systems and integration — Parts library*:

— *Part 1: Overview and fundamental principles;*

— *Part 20: Logical resource: Logical model of expressions;*

— *Part 24: Logical resource: Logical model of supplier library;*

— *Part 25: Logical resource: Logical model of supplier library with aggregate values and explicit content;*

— *Part 26: Logical resource: Information supplier identification;*

— *Part 31: Implementation resources: Geometric programming interface;*

— *Part 42: Description methodology: Methodology for structuring part families;*

— *Part 101: View exchange protocol: Geometric view exchange protocol by parametric program;*

— *Part 102: View exchange protocol by ISO 10303 conforming specification;*

— *Part 501: Reference dictionary for measuring instruments — Registration procedure;*

— *Part 511: Mechanical systems and components for general use — Reference dictionary for fasteners.*

The structure of the ISO 13584 series is described in ISO 13584-1. The numbering of the parts of ISO 13584 reflects its structure:

— Parts 10 to 19 specify the conceptual descriptions;

— Parts 20 to 29 specify the logical resources;

— Parts 30 to 39 specify the implementation resources;

— Parts 40 to 49 specify the description methodology;

— Parts 100 to 199 specify the view exchange protocol;

— Parts 500 to 599 specify the reference dictionaries.

A complete list of parts of ISO 13584 is available from the Internet:

http://www.tc184-sc4.org/titles/PLIB_Titles.htm

Introduction

ISO 13584 is an International Standard for the computer-interpretable representation and exchange of parts library data. The objective is to provide a neutral mechanism capable of transferring parts library data, independent of any application that is using a parts library data system. The nature of this description makes it suitable not only for the exchange of files containing parts, but also as a basis for implementing and sharing databases of parts library data.

ISO 13584 is organized as a series of parts, each published separately. The parts of ISO 13584 fall into one of the following series: logical resources, implementation resources, description methodology, view exchange protocol and reference dictionaries. The series are described in ISO 13584-1. This part of ISO 13584 is a member of the reference dictionaries series.

Parts of the standardized content series of parts specify ontologies for representing the entities of an application domain, together with their descriptive properties and domains of values. Each entity, property or domain of values constitutes an entry of a dictionary and it is associated with a computer sensible and human readable definition, and with a computer sensible identification. The unique identification of a dictionary entry allows it to be referenced unambiguously from any application. Definitions and identifications of dictionary entries are represented as instances of the EXPRESS entity data types defined in the common dictionary schema, or in its extensions defined in the logical series of parts of ISO 13584.

This part of ISO 13584 specifies the requirements for an ISO-registered reference dictionary for representing measuring instruments with their properties and domains of values. This part of ISO 13584 also establishes and specifies the behaviour of a registration authority whose role is to develop, maintain and update this ISO-registered reference dictionary for measuring instruments. These measuring instruments include environment measuring instruments and laboratory measuring instruments.

Industrial automation systems and integration — Parts library — Part 501: Reference dictionary for measuring instruments — Registration procedure

1 Scope

This part of ISO 13584 specifies the requirements for an ISO-registered reference dictionary for measuring instruments with their descriptive properties and domains of values. The measuring instruments to be included in the dictionary comprise environment measuring instruments and laboratory measuring instruments.

This part of ISO 13584 also specifies the procedures of an organization that develops, maintains and updates the reference dictionary for measuring instruments over a specified period of time. Such an organization is nominated by ISO and is referenced in this part of ISO 13584 as the registration authority of the reference dictionary for measuring instruments.

The reference dictionary for measuring instruments contains the following:

— definitions and identifications of classes of measuring instruments, with associated classification scheme;

— definitions and identifications of data element types that represent properties of measuring instruments;

— definitions and identifications of domains of values that prove useful for describing the above data element types.

Each class, property or domain of values of this application domain constitutes an entry of the reference dictionary for measuring instruments defined by the registration authority. It is associated with a computer sensible and human readable definition, and with a computer sensible identification. Each dictionary entry has an identifier that allows it to be referenced unambiguously from any application.

Definitions and identifications of dictionary entries are defined by means of standard data that

consist of instances of the EXPRESS entity data types defined in the common dictionary schema, and in its extensions defined in ISO 13584-24 and ISO 13584-25.

The following are within the scope of this part of ISO 13584:

— requirements on the standard data that is used to represent the various classes of measuring instruments, together with their descriptive properties and domains of values;

NOTE 1 Descriptive properties can include properties concerning regulations on manufacturing, operation, maintenance, disposal and recycling of the product.

— the process to be followed by the registration authority to propose and validate an initial version of the reference dictionary for measuring instruments;

— the process to be followed by the registration authority to collect, validate and register new entries or update entries for the reference dictionary for measuring instruments;

— the process to be followed by the registration authority to distribute the reference dictionary for measuring instruments.

NOTE 2 The measuring instruments considered in this part of ISO 13584 include those measuring instruments that are classified in the classes ICS 13 (Environment. Health protection. Safety), ICS 71.040 (Analytical chemistry) and ICS 17.220 (Electricity. Magnetism. Electrical and magnetic measurements).

NOTE 3 The file format with which the standard data registered by the registration authority established by this part of ISO 13584 can be exchanged is specified in ISO 10303-21.

The following is outside the scope of this part of ISO 13584:

— the standard data themselves that constitute the content of the reference dictionary for measuring instruments.

NOTE 4 The standard data themselves that constitute the content of the reference dictionary are registered by an ISO registration authority, but are not ISO-standardized.

NOTE 5 The standard data contain the definitions and properties of measuring instruments specified above, but they are not necessarily of measuring equipment.The difference in definitions between measuring equipment and measuring instruments is explained in IEC 60050-351.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the cited edition applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10303-21, *Industrial automation systems and integration — Product data representation and exchange — Part 21: Implementation methods: Clear text encoding of the exchange structure.*

ISO 13584-1:2001, *Industrial automation systems and integration — Parts library — Part 1: Overview and fundamental principles.*

ISO 13584-24:2003, *Industrial automation systems and integration — Parts library — Part 24: Logical resource: Logical model of supplier library.*

ISO 13584-25:2004, *Industrial automation systems and integration — Parts library — Part 25: Logical resource: Logical model of supplier library with aggregate values and explicit content.*

ISO 13584-26:2000, *Industrial automation systems and integration — Parts library — Part 26: Logical resource: Information supplier identification.*

ISO 13584-42:1998, *Industrial automation systems and integration — Parts library — Part 42: Description methodology: Methodology for structuring part families.*

ISO/IEC 6523-1:1998, *Information technology — Structure for the identification of organizations and organization parts — Part 1: Identification of organization identification schemes.*

ISO/IEC 6523-2, *Information technology — Structure for the identification of organizations and organization parts — Part 2: Registration of organization identification schemes.*

ISO/IEC 8824-1, *Information technology — Abstract Syntax Notation One (ASN.1) — Part 1: Specification of basic notation.*

3 Terms, definitions, and abbreviations

For the purposes of this document, the following terms and definitions apply. Some of these terms and definitions are repeated for convenience from:

— ISO 10303-1:1994;

— ISO 10303-11:1994;

— ISO 13584-1:2001;

— ISO 13584-42:1998;

— ISO 13584-24:2003;

— IEC 60050-300:2001.

3.1
applicable property
a property that is defined for some family of parts and that shall apply to any part that belongs to this family of parts

[ISO 13584-24:2003]

EXAMPLE For a screw generic family of parts, the threaded diameter is an applicable property: this characteristic applies to any screw.

3.2
application
a group of one or more processes creating or using product data

[ISO 10303-1:1994, definition 3.2.2]

3.3
assembled item
an item that is defined as a composition of other items

[ISO 13584-42:1998]

3.4
atomic item
an item that is not defined as a composition of other items

[ISO 13584-42:1998]

NOTE A part that consists of several subassemblies can be described as an atomic item if its class definition does not define its constituent subassemblies.

3.5
basic semantic unit
BSU
the entity that provides an absolute and universal identification of certain objects of the application domain (for example, classes, data element types)

[ISO 13584-42:1998]

3.6
characteristic of a part
part characteristic
a constant property, characteristic of a part, of which the value is fixed once the part is defined

[ISO 13584-24:2003]

NOTE Changing the value of a characteristic of a part would mean changing the part.

EXAMPLE For a ball bearing, the inner and outer diameters are part characteristics.

3.7
common dictionary schema
the information model for a dictionary, using the information modelling language EXPRESS, resulting from a joint effort between ISO TC184/SC4/WG2 and IEC SC3D

[ISO 13584-42:1998]

NOTE The common dictionary schema is specified in IEC 61360-2, and its content is provided in the informative ISO 13584-42:1998, Annex D.

3.8
composite property
collection of properties that can be referenced from a class or classes as a single entity

3.9
data
a representation of facts, concepts, or instructions in a formal manner suitable for communication, interpretation, or processing by human beings or computers

[ISO 10303-1:1994, definition 3.2.14]

3.10
data element type
DET
a unit of data for which the identification, the description, and value representation have been specified

[ISO 13584-42:1998]

3.11
data exchange
the storing, accessing, transferring, and archiving of data

[ISO 10303-1:1994, definition 3.2.15]

3.12
data type
a domain of values

[ISO 10303-11:1994]

3.13
dictionary
a table consisting of a series of entries. One meaning corresponds to each entry in the dictionary and one dictionary entry identifies one single meaning

[ISO 13584-1:2001]

NOTE 1 In ISO 13584, the kinds of meaning intended to constitute dictionary entries are: supplier, class, property, program library, type, table and document.

NOTE 2 In ISO 13584, the information that represents a dictionary entry is split into three entities: a basic semantic unit (BSU) that provides for reference, a dictionary element that describes the dictionary entry by means of attributes, and, possibly, a content item entity that describes the dictionary entry by describing its content.

3.14
dictionary data
the set of data that describes hierarchies of families of parts and properties of these parts

[ISO 13584-42:1998, definition 3.4.6]

3.15
dictionary element
the set of attributes that constitutes the dictionary description of certain objects of the application domain (for example, classes, data element types)

[ISO 13584-42:1998, definition 3.4.7]

3.16
entity
a class of information defined by common properties

[ISO 10303-11:1994, definition 3.2.5]

3.17
entity data type
a representation of an entity. An entity data type establishes a domain of values defined by common attributes and constraints

[ISO 10303-11:1994, definition 3.2.6]

3.18
entity (data type) instance
a named unit of data that represents a unit of information within the class defined by an entity. It is a member of the domain established by an entity data type

[ISO 10303-11:1994, definition 3.2.7]

3.19
environment measuring instrument
measuring instrument that is used to measure physicochemical properties of the environment, or of the substance that is released into the environment, such as air pollutants, noises, and water pollutants, soil contaminants, on spot or on line

3.20
family of parts
a simple or generic family of parts

[ISO 13584-42:1998]

3.21
family of products
simple or generic family of products each of which can have several parts

NOTE In object oriented paradigm, such a family is usually called class.

3.22
feature
an aspect of an item that can be captured by a class structure and set of properties and that cannot exist independently of the item

[ISO 13584-24:2003]

EXAMPLE In a piping component, an outlet is an aspect of a part that conforms to some preconceived function stereotype that is associated with properties (for example, its name, its role). It can be represented as a feature.

3.23
general model of a part
the library data that carries the definition and identity of a part in an integrated library

[ISO 13584-1:2001]

3.24
generic family of parts
a grouping of simple or generic families of parts done for purposes of classification or for factoring common information

[ISO 13584-24:2003]

3.25
implementation method
a technique used by computers to exchange data that is described using the EXPRESS data specification language

[ISO 13584-24:2003]

3.26
instance
a named value

[ISO 10303-11:1994, definition 3.2.8]

3.27
is-a relationship
the inheritance relationship defined in the object oriented paradigm

[ISO 13584-24:2003]

NOTE In ISO 13584 the is-a relationship holds between a family of parts and a generic family of parts to which the former family belongs.

3.28
is-case-of relationship
a relationship providing a formal expression of the fact that an object conforms to the partial specification defined by another object

[ISO 13584-24:2003]

NOTE In ISO 13584, all the properties and data types visible or applicable for some family of parts can be imported by all the families of parts that declare to be case-of the former family. These properties and data types can then be used to describe the latter families.

3.29
is-part-of
the aggregation part/whole relationship

[ISO 13584-24:2003]

NOTE In ISO 13584 the is-part-of relationship holds between a family of constituent parts and a family of assembled parts to which the constituent parts belongs.

3.30
item
a thing that can be captured by a class structure and a set of properties

[ISO 13584-42:1998/Cor.1:2002]

3.31
laboratory measuring instrument
measuring instrument that is used in a laboratory to measure physicochemical properties of target objects or samples of such objects that are either placed within a laboratory or brought into a laboratory, in a state isolated from the production process or from the environment

NOTE Measuring instruments of this category are supposed to have the properties specified by the standards of classes ICS 17.220 (Electricity. Magnetism. Electrical and magnetic measurements) and/or ICS 71.040 (Analytical chemistry).

3.32
library data supplier
an organization that delivers a supplier library in the standard format defined in ISO 13584 and is responsible for its content

[ISO 13584-1:2001]

3.33
library delivery file
a population of EXPRESS entity instances conforming to a library integrated information model and represented according to one of the implementation methods specified in ISO 10303

[ISO 13584-24:2003]

NOTE A library delivery file specifies the structure and the content of a supplier library. It can reference library external files.

3.34
library exchange context
the set of one library delivery file and zero, one or several library external files that represent together a supplier library

[ISO 13584-24:2003]

3.35
library external file
a file, referenced from a library delivery file, that contributes to the definition of a supplier library

[ISO 13584-24:2003]

NOTE The structure and the format of a library external file is specified in the library delivery file that references it.

3.36
library integrated information model
LIIM
an EXPRESS schema that integrates resource constructs from different EXPRESS schemas for representing supplier libraries for the purpose of exchange and that is associated with conformance requirements

[ISO 13584-24:2003]

3.37
measuring equipment
assembly of measuring instruments intended for specified measurement purposes

[IEC 60050-300:2001]

3.38
measuring instrument
device intended to be used to make measurements, alone or in conjunction with supplementary devices

[IEC 60050-300:2001]

3.39
part
a material or functional element that is intended to constitute a component of different products

[ISO 13584-1:2001, definition 3.1.16]

NOTE 1 A part can be an atomic component, a subsystem or a whole product provided that it can be reused in various contexts.

NOTE 2 In the ISO 13584 series, a part is characterized by class-belonging and property values.

3.40
product data
a representation of information about a product in a formal manner suitable for communication, interpretation, or processing by human beings or by computers

[ISO 10303-1:1994, definition 3.2.27]

3.41
property
set of characteristic information that conceptually characterizes a class and can characterize parts that belong to the class or its subclasses

3.42
RA dictionary
ISO 13584 compliant dictionary whose data elements are registered through RA and which can include intermediate releases and formal releases of the reference dictionary for measuring instruments

3.43
reference dictionary
ISO 13584 compliant dictionary whose data elements are registered through and formally released from the RA established with ISO 13584-501

3.44
registration authority
RA
organization authorized by ISO to register dictionary elements for the reference dictionary for measuring instruments, and commissioned to maintain and update the dictionary over a specified period of time

3.45
registration authority identifier
RAI
identifier assigned to a registration authority in accordance with the specification of ISO 13584-501

NOTE The RAI defined in this part of ISO 13584 is adapted from the one defined in ISO/IEC 11179-6.

3.46
secretary of registration authority
SORA
secretariat of registration authority
organization or a number of officers that are nominated by the hosting organization of the registration authority for the administration of the registration, and held responsible for the update and maintenance of the registered dictionary elements, whereas the office of the nominated officers, or the secretariat of the registration authority, may also be referenced as SORA

3.47
simple family of parts
a set of parts of which each part may be described by the same group of properties

[ISO 13584-24:2003]

3.48
standard data
requirement on a software system defined by means of EXPRESS entity (data type) instances that are supposed to be recognized by this software system

3.49
supplier library
a set of data, and possibly of programs, for which the supplier is defined and that describes in the standard format defined in ISO 13584 a set of parts and/or a set of representation of parts

[ISO 13584-1:2001]

NOTE The dictionary defined in this part of ISO 13584 can be exchanged as a supplier library.

3.50
technical committee of registration authority
TCRA
virtual community over the Internet that consists of technical experts in the domain of measuring instruments and associated data modelling

3.51
technical subcommittee of registration authority
TSRA
subcommittee of TCRA that consists of technical experts in a specific domain of measuring instruments and associated data modelling

3.52
validation committee of registration authority
VCRA
virtual community over Internet that consists of validation experts nominated by each member body of ISO and IEC and that agrees to participate in the dictionary registration process of this registration authority

3.53
visible property
a property that is defined for some family of parts and that may or may not apply to the different parts of this family of parts

[ISO 13584-24:2003]

EXAMPLE For a generic family of screws, the non-threaded length is a visible property: it is clearly defined for any screw, but only those screws with a non-threaded part have a value for this property.

NOTE The code of the class where a property is defined as visible is part of the identification of the data element type that represents this property.

4 Representation of ontology concepts as dictionaries entries

4.1 Measuring instrument classes

4.1.1 Modelled classes

In the reference dictionary for measuring instruments, only **item_class** shall be used for capturing the concept of a class of product of measuring instruments. If a product imports some properties

from other classes, **item_class_case_of** may be used instead of the class mentioned above. Entities of class such as **component_class**, **material_class**, **feature_class**, **component_class_case_of**, **material_class_case_of**, **feature_class_case_of,** **functional_model_class**, and **functional_view_class** shall not be used in this reference dictionary. For the purpose of modelling a concept of composite property which may encompass a collection of properties, **item_class** or **item_class_case_of** shall be used instead of **feature_class** and **feature_class_case_of**. If the concept of the composite property may not stand alone and shall be embedded in a class, the intent shall be marked with a literal string "embeddable" in the **remark** attribute of the **item_class** or **item_class_case_of** used for modelling the property. If the concept of the composite property may be sharable with other classes as a stand alone concept, this shall be modelled as an **item_class** or **item_class_case_of** without marking in the attribute. This literal marking in the attribute may be substituted or reinforced by a structural attribute for the same purpose, when a future edition of ISO 13584-42 introduces such an attribute in **item_class** or **item_class_case_of**.

4.1.2 Referenced classes

Classes of other ISO 13584-compliant dictionaries shall be referenced whenever possible and appropriate in this reference dictionary for measuring instruments to avoid duplication of standardization effort.

4.1.3 Used attributes

In the reference dictionary for measuring instruments, classes shall be defined by the following information elements specified in ISO 13584-42:

— Code;

— Superclass;

— Preferred Name;

— Synonymous Name;

— Visible Types;

— Applicable Types;

— Visible Properties;

— Applicable Properties;

— Definition;

— Source Document of Definition;

— Note;

— Simplified Drawing;

— Date of Original Definition;

— Date of Current Version;

— Date of Current Revision;

— Version Number;

— Revision Number;

— Remark.

The following information elements specified in ISO 13584-42 shall not be used for defining the classes specified in this part of ISO 13584:

— Short Name;

— Sub-Class Selection Properties;

— Class Value Assignment.

4.2 Property DET definitions

4.2.1 Modelled properties

No **condition_DET** or **dependent_P_DET** shall be used.

4.2.2 Imported properties

Properties defined in other ISO 13584-compliant dictionaries shall be imported whenever possible by the reference dictionary for measuring instruments to avoid duplication of standardization effort. Property importation shall be done by means of the case-of relationship.

4.2.3 Used Attributes

In the reference dictionary for measuring instruments, properties shall be defined by the following information elements specified in ISO 13584-42:

— Code;

— Definition Class;

— Data Type;

— Preferred Name;

— Synonymous Name;

— Definition;

— Source Document of Definition;

— Note;

— Unit;

— Value Format;

— Date of Original Definition;

— Date of Current Version;

— Date of Current Revision;

— Version Number;

— Revision Number;

— Remark.

The following information elements specified in ISO 13584-42 shall not be used for defining the property DETs specified in this part of ISO 13584:

— Preferred Letter Symbol;

— Short Name;

— Synonymous Letter Symbols;

— Property Type Classification;

— Condition;

— Formula.

4.3 Data type definitions

4.3.1 Modelled domains of values

All the data types allowed in ISO 13584-42 are also allowed for the dictionary elements to be registered through the registration authority (RA) established by this part of ISO13584. In addition, aggregate types defined in ISO 13584-25 may be used for property definition.

4.3.2 Used Attributes

This part of ISO 13584 has no used attributes for data type definitions.

4.4 Identification of dictionary entries

As defined in ISO 13584-42, classes, properties and data types are identified by BSUs. The coding style of BSU is illustrated in the Figure 1. The **class_BSU**, the **property_BSU** and the **data_type_BSU** defined and used in the Reference Dictionary shall start with capital letters 'P501_C' for **class_BSU**s and 'P501_P' for **property_BSU**s and 'P501_T' for **data_type_BSU**s, respectively. Imported properties from any other dictionary compliant to ISO13584 data model shall retain the codes issued by the dictionary supplier of the property. For the properties that could be presumably imported from a foreign class being outside the scope of this reference dictionary, but currently no ISO 13584 compliant dictionary is available for such, the first letter of the third section shall start with 'F' to mark that they are of foreign nature. If necessary, provisional classes are also created for such properties, and shall be assigned a **class_BSU** whose third section starts with 'F'. Thus, when a due reference dictionary with a proper scope is made for such classes and properties, they may become deprecated but the code themselves shall be maintained. These provisions are intended to clarify in which part of the standard content series of ISO13584 or in any other standards, the definitions of these properties can be found. In addition, a single underscore is inserted between 'P501' and 'C', between 'P501' and 'P', or between 'P501' and 'T' to improve the readability of the codes.

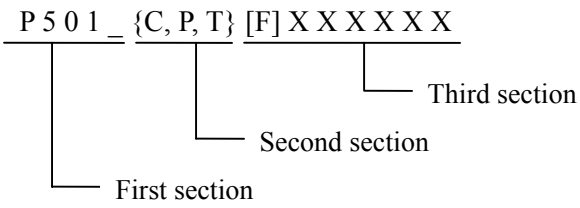

Figure 1 — BSU coding style

EXAMPLE Valid codes are P501_C000001, P501_P000001.

4.5 Specification of registration status

For data elements to be registered through the RA to be established by this part of ISO 13584, a designation of the position in the registration life-cycle of the data element shall be assigned. In case of a class or a property, the status shall be recorded in the **remark** attribute of each data element. The following statuses shall be assigned by the RA for each data element in the process of implementing the registration procedure established by this part of ISO 13584:

rejected: The data element submitted to the RA did not contain all mandatory attribute values specified by this part of ISO 13584, and thus does not meet the formality requirements specified in this or other parts of ISO 13584.

recorded: The registered data element contains all mandatory attribute values, but the content may not meet the quality requirements specified in this or other parts of ISO 13584, or may contain technically irrelevant or incorrect information that may be disapproved by the technical experts of the RA.

certified: The recorded data element has met the quality requirements specified in this or other parts of ISO 13584 and has been technically approved by the technical experts of the RA.

validated: The certified data element has been approved by the validation experts of the validation committee of the RA for the adoption into a new formal release of the RA dictionary.

deprecated: A recorded, certified, or standardized data element is considered no longer desirable for describing a product from a certain time on; thus, it is in a phase-out period. Such a data element might have been superseded by a new data element.

Note that a product described by such a deprecated data element remains in use for a long time; thus, it is inappropriate to remove such a data element from the RA dictionary.

NOTE The labels of statuses used here are adapted from ISO/IEC 11179-6 except for **validated** and **deprecated**, for the counterparts of the original definitions in ISO/IEC 11179-6 are not completely fit for this part. Note that the dictionary elements are RA-collected but not standardized, and the items that are once put into use with a formal BSU cannot be retracted in ISO 13584.

5 Classification principles

5.1 Connection to pre-existing classification

This part of ISO 13584 has no connection to a single pre-existing classification.

5.2 Upper level of the hierarchy

5.2.1 Principal identification hierarchy

The upper level of the standard identification hierarchy of the reference dictionary for measuring instruments shall consist of the following layers, and shall be referenced as principal identification hierarchy (or layers):

— first layer: Domain;

— second layer: Function;

— third layer: Principle.

5.2.2 Domain

Measuring instruments shall be classified as either environment measuring instruments, or laboratory measuring instruments.

5.2.3 Function

Measuring instruments may be classified by the physical quantity or quality they measure.

EXAMPLE “mass spectrometer”, “online water quality analyzer”, “online air quality analyzer”

5.2.4 Principle

Measuring instruments may be classified by their measuring principles.

EXAMPLE "inductively coupled plasma mass spectrometer", "gas chromatography mass spectrometer"

5.3 Subdivision of principal identification layers

If a further subdivision of the principal identification hierarchy seems appropriate, a sub-layer may be introduced for any of the principal identification layers, provided the total number of levels of the principal identification hierarchy shall not exceed six, and only one sub-layer at maximum may be introduced for each principal layer.

EXAMPLE The "carbon monoxide measuring instrument" is a subdivision of the function layer of the "online air quality analyzer"

5.4 Simplification of principal identification layers

If at a certain level of layers, all the principal layers below are considered irrelevant for a family of products, or unprepared for publication in the process of registration, all such layers may be omitted from the hierarchy. However the order of appearance of those layers specified in **5.2** in the principal identification hierarchy shall not be reversed or changed.

5.5 Lower level of the hierarchy

If the instances of a certain family of products are not all characterized by the same set of properties of any class at the bottom of actual principal identification hierarchy, additional layers may be introduced as supplementary identification layers below the bottom layer of principal identification hierarchy. However, in all cases the total number of levels of the standard identification hierarchy of the reference dictionary shall not exceed six.

5.6 Auxiliary classification

A class considered to be part of some other classification in nature but is referenced as a component of a measuring instrument within the scope of this part of ISO13584 may be eventually defined in this reference dictionary for measuring instruments because of the absence of such a preexisting classification scheme compliant to ISO13584 data model. In this case, such classes may be grouped together, and placed under a class marked "auxiliary parts" which is on par with the level of the first layer. In the same manner, as noted previously in **4.4**, the properties, such that they could be presumably imported from a foreign class being outside the scope of this reference dictionary but currently no such a dictionary is available, may be grouped together and placed in an external class or classes named appropriately. The intent of these provisions is to facilitate the future emigration of those classes and properties from this reference dictionary to

another reference dictionary, when such a dictionary compliant to ISO 13584 data model and with a proper standardization scope is provided for reference.

6 Computer sensible description

6.1 External files

Figures, drawings, and programmes are neither the subject of standardization nor registration for this registration authority (RA).

6.2 Information model and conformance class

The computer sensible description of the reference dictionary for measuring instruments shall conform to the library integrated information model defined in ISO 13584-25 in conformance class 4 with a further restriction that description of **item_representation** and representation categories of items shall not be used.

6.3 Implementation method

The computer sensible description of the reference dictionary for measuring instruments shall be available as a file conforming to ISO 10303-21. In addition, other formats may be used as they become available as International Standards.

NOTE Other formats may also be provided by the RA.

6.4 Language to be used for text attributes

The computer sensible description of the reference dictionary for measuring instruments shall be available with all textual attributes defined in the English language.

NOTE Translations in other languages may also be provided by the RA or by third parties.

6.5 Distribution of computer sensible descriptions

Computer sensible descriptions of every formal release of the reference dictionary for measuring instruments shall be made available by the RA as freely downloadable files from an Internet server. Between two formal releases, the RA may also make available the intermediate releases of the RA dictionary that comprise the data elements approved by the TCRA but not yet validated by the VCRA.

6.6 Control on the intermediate and formal releases

For those intermediate releases of the reference dictionary containing data elements that are proposed or submitted to this RA for the purpose of registration in the reference dictionary for measuring instruments but not yet published in any formal release, the RA shall have the

exclusive authority to maintain, edit, or publish them in paper form, in an electronic form, or in any other forms. No other organization or person shall be allowed to publish the intermediate releases of the reference dictionary without written consensus from this RA.

The intermediate releases of the reference dictionary for measuring instruments shall be kept open to the members of technical committee of the RA. This limited disclosure of the intermediate releases shall not be construed as any privilege to set up a hindrance to the free circulation of the reference dictionary .

NOTE Prior to the submission to this RA, dictionary elements may have been used in a private specification or any other consortium data dictionary. Once the elements are proposed and formally registered in this RA, it is requested to the applicant of such elements that the definitions in the original specification or dictionary be marked as deprecated, and the use of the formally registered definitions be promoted.

The rules of the circulation for the formal releases of the reference dictionary are as follows:

— the content of the computer sensible description of the reference dictionary for measuring instruments may be downloaded, exchanged and used without charge for implementation purpose;

— definitions contained therein are permitted in teaching manuals, instruction booklets, technical publications and journals.

The conditions for such reproduction are that:

— no modifications are made to the terms and definitions;

— reproduction for commercial purposes is not authorized without permission in writing from either ISO, at the address below, or ISO's member body in the country of the requester:

ISO copyright office
Case postale 56
CH-1211 Geneva 20
Tel. +41 22 749 01 11
Fax +41 22 749 09 47;

— the ISO 13584-501 is referenced as the source.

6.7 Registration authority identifier

Every organization wishing to become an RA shall possess an internationally recognized organization code, assigned in accordance with the procedure prescribed in ISO/IEC 6523-2. The entire structure for identification of organizations, as described in ISO/IEC 6523-1:1998, Clause 4 shall be the internationally unique registration authority identifier (RAI) for the purpose specified in this part of ISO 13584.

7 Registration and maintenance procedure

7.1 Structure of registration authority

The registration authority (RA) shall consist of three tiers: technical experts, secretary of registration authority, and validation experts. In addition to the above three parties, each ISO/IEC member body of the participating countries of either ISO or IEC may play a role by nominating the validation experts. All the parties involved in the process of RA of this part of ISO 13584 are summarized in Table 1.

Table 1 — Structure of registration authority and levels of participation

Name	Level of authorization	Appointment	Role	Time frame
Technical expert of registration authority	Technical committee of registration authority (TCRA)	a) Volunteers whose identity and affiliation can be confirmed by SORA. b) Chair(s) of TCRA shall be nominated by the hosting organisation of RA.	Propose items for dictionary	Any time
			Comment and vote on proposed items	a) Within three weeks from a TCRA circulation b) Within a week from circulation of a TCRA solution
Secretary of registration authority	Secretariat of registration authority (SORA)	Nominated by the hosting organisation of RA.	a) Manage the register of dictionary b) Manage votes c) Prepare formal and intermediate releases of dictionary	a) Prepare a TCRA circulation within a week from formal registration of application b) Prepare a TCRA solution as inconsistency occurs c) Update RA dictionary as new items approved by TCRA d) Draft and publish a new formal release Min. once a year Max. twice a year
Validation expert of registration authority	Validation committee of registration authority (VCRA)	a) One from ISO member body and another from IEC member body of each participating country of ISO or IEC, which is willing to participate in this RA. b) Three from the hosting organization (including the chairperson).	Vote on a new formal release	a) Min. once a year b) Max. twice a year within four weeks from the circulation of draft

7.2 Role and responsibility

7.2.1 Role and responsibility of parties

Each participating party of the registration authority specified by this part of ISO13584 owes a unique role and responsibility in the registration procedure of dictionary elements. The roles and responsibilities of each party are summarized in the following.

7.2.2 Technical committee of registration authority

The structure of the technical committee shall be as follows.

— The technical committee of the registration authority (TCRA) shall be formed by the technical experts who are registered at the registration authority (RA) and whose identity and affiliation can be confirmed by the RA prior to their participation in the TCRA. Technical experts may participate in or withdraw from the technical committee at any time, however, a technical expert may vote only on proposals registered after his participation and before his withdrawal. If necessary, the secretary of registration authority (SORA) may request confirmation of the identity of technical expert(s) to the affiliated organization or to the relevant ISO/IEC member body.

— The SORA may subdivide the TCRA into technical subcommittees (TSRA), each one of which covers a specific sub-domain of the measuring instruments, and may delegate the study, discussion, and decision to a TSRA, if and only if there are at least five experts of TCRA willing to participate in the TSRA.

— The chair for TCRA and the chair for each TSRA may be nominated among the registered experts by SORA, for leading and managing the discussion. When a TSRA is created, it must be announced to all the registered technical experts, and any of those registered for the TCRA may participate in the TSRA by declaring his or her intention to do so. A TSRA may be closed by the chairperson of TSRA when a voting is finished, or it may be maintained at the request of SORA with or without a change of the chairperson if there remain issues to study or discuss within the TSRA.

— The TCRA and TSRA(s) shall be convened, maintained, and adjourned over the Internet.

The role of the technical committee shall be as follows.

— The role of the technical experts is to propose new dictionary elements to be included in the dictionary or changes to existing dictionary elements. They are also expected to comment,

discuss, and vote on any proposal about dictionary elements to reach a collective TCRA decision within three weeks after the TCRA circulation.

— Technical experts are also expected to consult on domain specific definitions, practices, and use of terms and units, and are invited to cast a vote on solutions prepared by the SORA for the resolution of issues arising from the inconsistencies between the newly approved dictionary items by the TCRA and an existing RA dictionary, upon a request from the SORA.

— In a vote, no more than three experts being employed by or paid by the same organization may take part in the vote. Consultants and advisers being paid by the above organization shall be counted as the members of the organisation. The hosting organization of the RA may delegate three representatives at maximum in one voting. In case that the numbers of votes for approval and disapproval are tied, the chairperson may exert one additional vote for tie-breaking.

7.2.3 Secretary of registration authority

The structure of the secretary of registration authority (SORA) shall be as follows.

— The SORA shall be an organization or person(s) that is responsible for the registration of dictionary elements and their maintenance for this reference dictionary. The SORA shall be appointed by the organization designated as the registration authority for this part of ISO 13584 by the ISO.

The role of the SORA shall be as follows.

— The SORA shall circulate by electronic means the proposed items to the TCRA (TCRA circulation, hereafter) after having checked their conformance to the specification of the application format, within a week from the date of formal registration of the item.

— The SORA shall initiate a vote for proposed items within three weeks from the TCRA circulation, in order to prepare a draft formal release of the reference dictionary to be circulated to the validation committee.

— The SORA shall notify the result of the TCRA vote to all the registered technical experts of TCRA.

— The SORA may resend the proposed item to the TCRA with or without a recommended solution by the SORA for requesting a confirmation vote by the TCRA, in order to resolve inconsistency that is found in the process of the integration of the approved proposed item

with the existing RA dictionary.

— The SORA may circulate a draft formal release of the RA dictionary by electronic means to the VCRA for its validation after compiling the results of votes at TCRA.

— The SORA shall initiate a vote among VCRA members to decide on a release of a formal release of the RA dictionary.

— The SORA may negotiate with the members of VCRA for a possible change of votes by means of solving the comments in case that the total number of votes with “yes” and “yes with comments” does not reach the two thirds of the total of the cast votes. If no positive consensus is reached through the negotiation within four weeks, the SORA shall recirculate the case to the TCRA abandoning the new formal release.

— The SORA shall publicize at least once a year and at most twice a year a new formal release of the reference dictionary for measuring instruments, maintained and updated by the RA. In each publication, by electronic means, a notice including a URI of the published dictionary shall be sent to all the member bodies of the ISO to inform where to find the new release of the reference dictionary.

— The SORA may establish supplementary rules for the administration of the RA.

7.2.4 Validation committee of registration authority

The structure of the validation committee of registration authority (VCRA) shall be as follows.

— The VCRA shall consist of the validation experts who have been nominated by the ISO or IEC member body of each participating country. In addition to the validation experts nominated by the ISO/IEC member body, there shall be three additional validation experts nominated by the hosting organisation of the RA.

The role of the VCRA shall be as follows.

— Validation experts check the conformance of each formal release of the reference dictionary for measuring instrument with ISO 13584-42, ISO 13584-25, and this part of ISO 13584.

— Validation experts check the technical integrity of the reference dictionary for measuring instruments as a whole and execute a vote on a new release of it prior to its publication, within four weeks from the date of circulation of the draft.

— In each voting mentioned above by the validation experts, a vote must be either, “yes”, “yes with comments”, or “no with comments”.

7.2.5 ISO/IEC member body

Each ISO or IEC member body that participates in ISO TC 184/SC 4 as P-member or that participates in IEC TC 3/SC 3D as P-member may participate in the process of the RA by nominating a validation expert. Methods or criteria to select validation experts are at the discretion of each member body.

The role of the ISO/IEC member bodies for this registration authority shall be as follows.

— Each ISO/IEC member body that agrees to participate in the registration process of this registration authority may assign per each one national representative to the validation committee.

— Each ISO/IEC member body that has assigned a national representative adopts a new formal release of reference dictionary for measuring instruments.

7.3 Registration procedure

7.3.1 Decision rules

An application form for proposing modifications in the reference dictionary for measuring instruments is specified in normative annex E. Proposals to the RA shall be automatically checked to see if all the mandatory fields of application form are filled by the applicant. After this check, each application shall be assigned an application identifier, and if necessary, provisional **class_BSU**s or a **property_BSU**s shall be assigned for creating an experimental dictionary in a physical file using proposed items. These identifiers and provisional BSUs shall be notified to all the technical experts including the applicant.

A proposal for adoption or modification of a data element of the dictionary shall be approved by the TCRA if the majority of the effective votes agree to the proposal. For all the approved items, a formal **class_BSU**, and/or a **property_BSU** shall be issued from the RA. These BSUs assigned to the proposed items shall be maintained regardless of the outcome of votes by the VCRA.

A proposal for adoption or modification of a data element of the dictionary shall be approved by the VCRA if more than or equal to the two thirds of the effective votes agree to the proposal.

The items that are approved by the VCRA are intended to be merged into the existing reference dictionary and published in the subsequent formal release of the dictionary. Once approved by the VCRA, items are made available to the public on the Internet. A formal release of the dictionary

shall be undertaken once or twice a year.

7.3.2 Registration process flow

Figure 2 illustrates the time sequences of registration procedures at the RA described above. A vertical line that extends downward from a rectangular box signifies the sequence of actions taken at each group labeled in the box. Prior to submission of a new dictionary element, any applicant must register his or her name, electronic mail address, and affiliation at registration authority as a technical expert. The registration of the technical experts shall be performed at an Internet site maintained by the RA. The RA may delegate the actual service of the site to a third party, as long as it is done by the name of, and under the auspices of the RA.

Figure 3 explains how the information flows between each group of RA. An alphabet assigned to a box in the SORA lane indicates a point of time in the flow of processes at SORA, corresponding to the one used in the Figure 2.

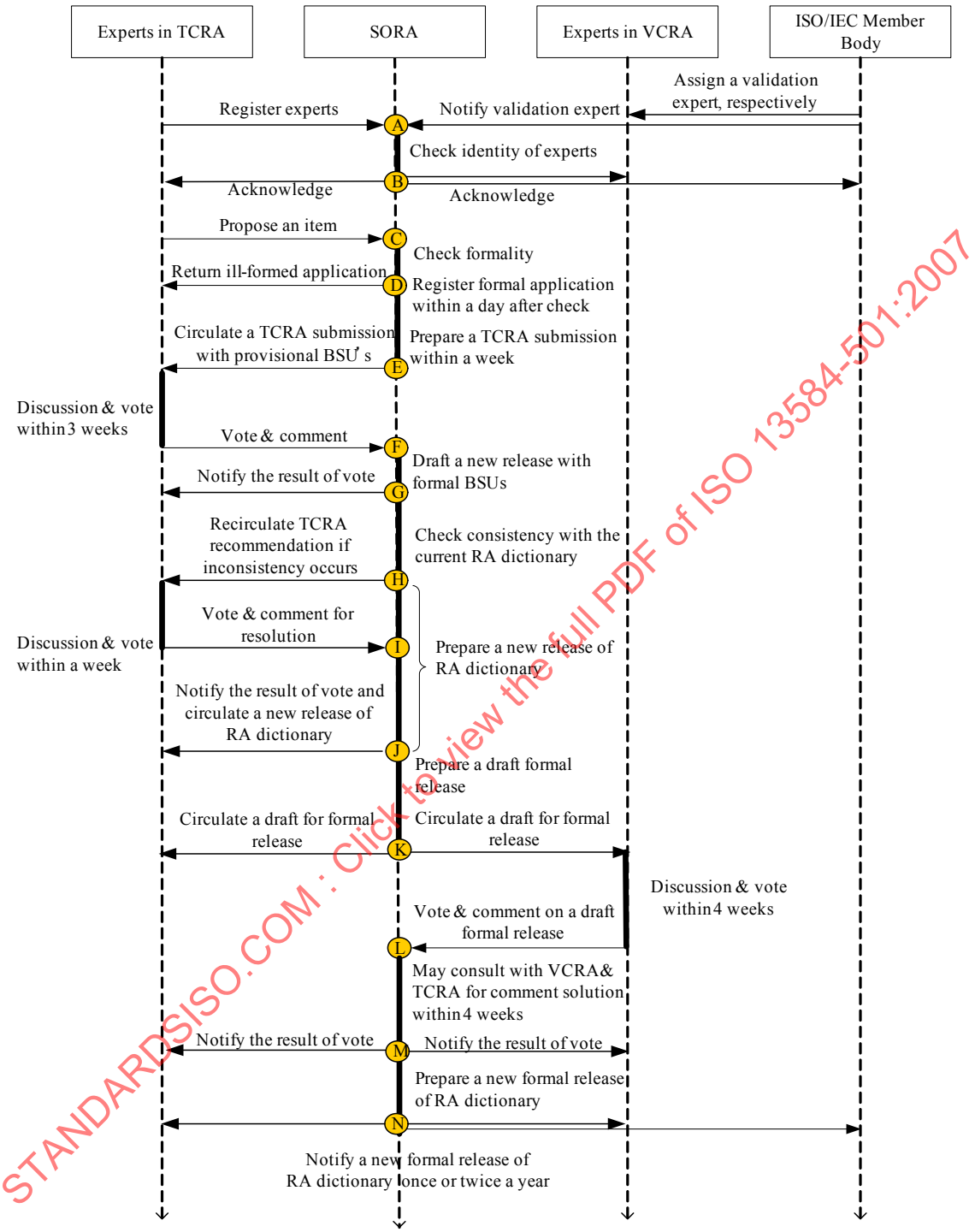

Figure 2 — Registration time frame

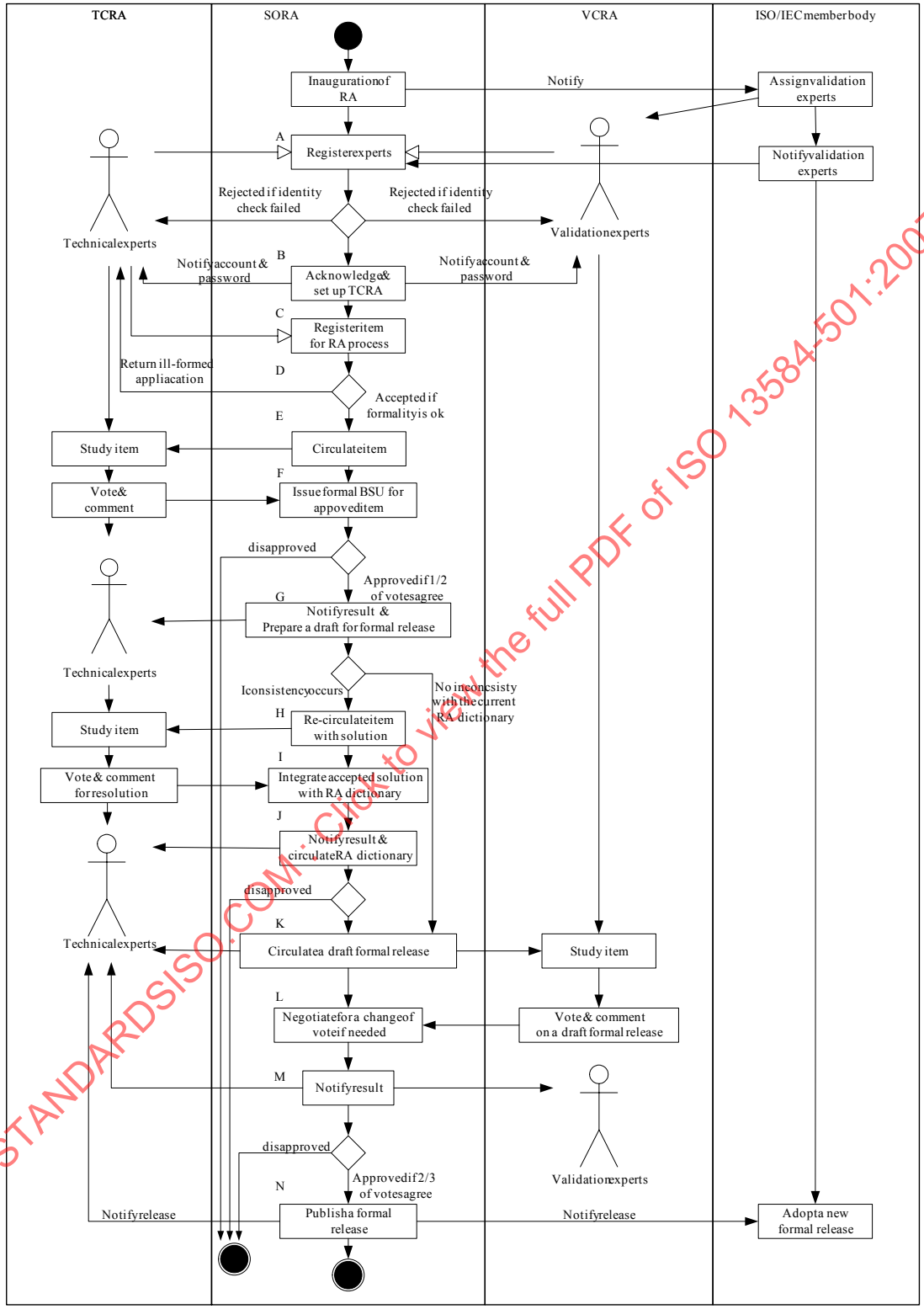

Figure 3 — Registration flow diagram

7.3.3 Task of registration authority

The task of the registration authority at each node of the registration time frame is as follows:

— point A: the SORA shall receive applications for the registration of technical experts of TCRA, and the same for the validation experts of VCRA. Each validation expert must be nominated by one of the either ISO or IEC member bodies prior to the registration;

— point B: the SORA shall acknowledge registered technical experts for the TCRA and registered validation experts for the VCRA, if required conditions for their registration are satisfied;

— point C: a proposal from an expert to add or modify items in the reference dictionary is received by the SORA. After a formality check to see if all the required fields of information are filled appropriately, the proposal shall be assigned a registration code, while each class and property is assigned a provisional **class_BSU**, and a provisional **property_BSU**, respectively. Thereafter, the proposed items shall be referenced, by this registration code, and/or by these provisional BSUs;

— point D: a proposal may be returned if any of the essential information is missing, or not complying with the specified format. In this process, the formality check shall be done semi-automatically by a computer software;

— point E: items that have passed the formality check shall be grouped together for compilation. The compiled result shall be circulated to the TCRA for study, discussion, comment, and for a vote. When circulated to the technical experts, the name(s) of the proposer and his or her affiliation shall be withheld to keep the neutrality of judgments;

— point F: a new formal **class_BSU** , **property_BSU**, or **data_type_BSU** shall be issued for the approved items by the TCRA replacing the provisional BSUs, and they shall be compiled into a TCRA recommendation. Once the formal BSUs are issued, they shall be maintained regardless of the consequent vote by the VCRA;

— point G: the result of the vote by the TCRA shall be notified to the TCRA members and a new intermediate release of RA dictionary shall be drafted, with a purpose to see if there is any inconsistency with the current version of the RA dictionary;

— point H: if a significant inconsistency with the current version of the RA dictionary occurs, the SORA shall re-circulate a TCRA recommendation with a solution, and request the TCRA for another vote on the solution. If no such inconsistency occurs, the SORA shall immediately

start preparing a new release of the RA dictionary;

— point I: the SORA shall prepare a new intermediate release of the RA dictionary, reflecting the result of second TCRA vote on the proposed solutions;

— point J: the SORA shall notify the result of second TCRA vote on the proposed solutions and start preparing a draft formal release of the reference dictionary;

— point K: the draft of a new release of dictionary in ISO10303 physical file format shall be prepared by the SORA, and circulated to the VCRA and TCRA members for the confirmation of the integrity of entire dictionary content;

— point L: the VCRA members shall vote on the draft of a new formal release of the RA dictionary for the confirmation of the integrity of the content within four weeks from the date of circulation of the draft. After the vote by the VCRA members, the SORA may negotiate with the VCRA members within 4 weeks for solution of comments and/or possible change of votes, if this can be achieved without conflicting with the TCRA recommendation. Otherwise the draft shall be abandoned;

— point M: the SORA shall notify the result of vote on a new formal release of RA dictionary;

— point N: the SORA shall notify a new formal release of RA dictionary once or twice a year.

8 Principles of dictionary edition, update, and maintenance

8.1 Initial release of the dictionary

Once the Draft International Standard of this part of ISO 13584 is approved, the organization presumed to become the first hosting organization of the RA shall establish provisional SORA for preparing the initial release of the dictionary. Candidates for technical experts shall be called on for registration and ISO and IEC member bodies shall be requested to nominate validation experts as their national representatives.

Thereafter, a provisional TCRA shall be established. The technical experts shall be invited to issue comments on the initial dictionary content of the reference dictionary (abbreviated hereafter as IDC) for measuring instruments prepared by the provisional SORA, and all the comments shall be discussed according to the rules specified in Clause 7. When all the issues have been resolved, a draft of the dictionary shall be prepared and published on the Internet for review.

Once the draft International Standard of this part of ISO 13584 is approved, the SORA shall be formally established, and then the SORA shall commence a formal registration procedure for the IDC as described in Clause 7.

8.2 Version and revision numbers of dictionary elements

8.2.1 Version number

The first version of a dictionary element shall be issued by the SORA after the approval of the item by the TCRA. Update of the dictionary element through the VCRA validation process increments the version by one million (1000000), while the updates resulting from the TCRA approval and the consequent SORA maintenance activities increment the version by just one (1). The versions are expressed in nine digit codes in a string data type. Thus a property or class that has its version as 002000003 signifies it has received VCRA approval two times, and version updates at TCRA and SORA three times.

8.2.2 Revision number

The first revision of a dictionary element shall be created by SORA after the approval of the item by the TCRA. Any update of the revision of dictionary elements though VCRA validation process or from the TCRA and SORA maintenance activities increments the revision by just one (1) in the same manner. The revisions are expressed in three digits codes in a string data type as explained in ISO13584-42. Thus a property or class that has its revision as 003 means it has received revisions at TCRA, VCRA, or SORA three (3) times. The revision number shall be reset to zero

(0) each time the version number of the corresponding dictionary element is changed.

8.3 Identification of a formal release of the reference dictionary

Each formal release shall be identified by a dictionary code, a version number, a revision number and a supplier code. These values shall in particular be recorded in the **dictionary_identification** entity of the computer sensible representation of any formal release of the reference dictionary for measuring instruments.

Both the dictionary code and the supplier code shall be the standard number of this part of ISO 13584 as defined by ISO 13584-26:2000, 5.1 and 5.2.

NOTE 1 The standard number of this part of ISO 13584 as defined by ISO 13584-26:2000, 5.1 and 5.2, is '112/1///13584_501_1'.

The version number of the first formal release submitted by the tentative SORA for adoption of ISO and IEC member bodies shall be nine (9). The version of the initial dictionary resulting from this vote, possibly with some changes, shall be ten (10). The version number of each new formal release submitted to vote shall be the version number of the previous adopted release incremented by nine (9). The corresponding adopted release shall be the number of the submitted release incremented by one (1).

The revision number of submitted and adopted formal releases shall always be zero (0).

NOTE 2 Other values of version and revision numbers are reserved for internal use within SORA, TCRA and VCRA.

Annex A
(normative)
Information object registration

A.1 Document identification

In order to provide for unambiguous identification of an information object in an open system, the object identifier

{ iso standard 13584 part (501) version (1) }

is assigned to this part of ISO 13584. The meaning of this value is defined in ISO/IEC 8824-1, and is described in ISO 13584-1.

Annex B
(normative)
Dictionary physical file

A physical file that contains the latest formal release of the dictionary shall be accessed at the following addresses.

http://www.ISO13584-501RA.org/PLIB_P501RA/Part501_Dictionary

http://www.tc184-sc4.org/PLIB_dictionaries/

The above addresses may also contain associated human-readable documents that explain class and property definitions of the latest formal release of the dictionary.

In addition to the formal release, the intermediate releases of the dictionary shall be accessible for the technical experts of this registration authority from the first address.

Annex C
(normative)
Class definition

The URI of a web page that contains a human-readable documentation of the classes of which the definition have been certified since the last formal release shall be listed in the following.

http://www.ISO13584-501RA.org/PLIB_P501RA/class_definition

Annex D
(normative)
Property definitions

The URI of a web page that contains a human-readable documentation of the properties of which the definition have been certified since the last formal release shall be listed in the following.

http://www.ISO13584-501RA.org/PLIB_P501RA/property_definition

Annex E
(normative)
Application form for dictionary elements

Either the following paper application forms given in E.1 and E.2, or an electronic application form at the URI listed in E.3 shall be used for a new dictionary element application or for modification.