INTERNATIONAL STANDARD

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Software engineering — Lifecycle profiles for Very Small Entities (VSEs) —

Part 4-1: Profile specifications: Generic profile group

Ingénierie du logiciel — Profils de cycle de vie pour très petits organismes (TPO) —

Partie 4-1: Spécification de profil: Groupe de profil générique

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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

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

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

ISO/IEC 29110-4-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

ISO/IEC 29110 consists of the following parts, under the general title *Software engineering — Lifecycle profiles for Very Small Entities (VSEs)*:

— *Part 1: Overview* [Technical Report]

— *Part 2: Framework and taxonomy*

— *Part 3: Assessment guide* [Technical Report]

— *Part 4-1: Profile specifications: Generic profile group*

— *Part 5-1-2: Management and engineering guide: Generic profile group: Basic profile* [Technical Report]

Parts 4 and 5 can be developed to accommodate new profile specifications and management and engineering guides as follows:

— *Part 4-m: Profile specifications: Profile group aaaaa*

— *Part 5-m-n: Management and engineering guide: Profile group aaaaa: Profile bbbbb* [Technical Report]

This first edition of part 4-1 contains the specification for the first profile developed (Basic). As more profiles are developed, this part will be restructured and amended to accommodate and include multiple specifications.

— *Part 4-1: Profile specifications: Generic profile group*

Introduction

The software industry recognizes the value of Very Small Entities (VSEs) in contributing valuable products and services. For the purpose of ISO/IEC 29110, a Very Small Entity (VSE) is an entity (enterprise, organization, department or project) having up to 25 people. VSEs also develop and/or maintain software that is used in larger systems; therefore, recognition of VSEs as suppliers of high quality software is often required.

According to the Organization for Economic Co-operation and Development (OECD), SME and Entrepreneurship Outlook report (2005), 'SMEs constitute the dominant form of business organisation in all countries world-wide, accounting for over 95 % and up to 99 % of the business population depending on country'. The challenge facing OECD governments is to provide a business environment that supports the competitiveness of this large heterogeneous business population and that promotes a vibrant entrepreneurial culture.

From studies and surveys conducted, it is clear that the majority of International Standards do not address the needs of VSEs. Conformance with these standards is difficult, if not impossible, giving VSEs no way, or very limited ways, to be recognized as entities that produce quality software in their domain. Therefore, VSEs are often cut off from some economic activities.

It has been found that VSEs find it difficult to relate International Standards to their business needs and to justify their application to their business practices. Most VSEs can neither afford the resources, in terms of number of employees, budget and time, nor do they see a net benefit in establishing software lifecycle processes. To rectify some of these difficulties, a set of guides has been developed according to a set of VSE characteristics. The guides are based on subsets of appropriate standards elements, referred to as VSE profiles. The purpose of a VSE profile is to define a subset of International Standards relevant to the VSE context, for example, processes and outcomes of ISO/IEC 12207 and products of ISO/IEC 15289.

ISO/IEC 29110, targeted by audience, has been developed to improve product and/or service quality, and process performance. See Table 1. ISO/IEC 29110 is not intended to preclude the use of different life cycles, such as waterfall, iterative, incremental, evolutionary or agile.

Table 1 — ISO/IEC 29110 target audience

ISO/IEC 29110	Title	Target audience
Part 1	Overview	VSEs, assessors, standards producers, tool vendors, and methodology vendors
Part 2	Framework and taxonomy	Standards producers, tool vendors and methodology vendors. Not intended for VSEs.
Part 3	Assessment guide	Assessors and VSEs
Part 4	Profile specifications	Standards producers, tool vendors and methodology vendors. Not intended for VSEs.
Part 5	Management and engineering guide	VSEs

If a new profile is needed, ISO/IEC 29110-4 and ISO/IEC TR 29110-5 can be developed without impacting existing documents and they become ISO/IEC 29110-4-m and ISO/IEC 29110-5-m-n, respectively, through the ISO/IEC process.

ISO/IEC TR 29110-1 defines the business terms common to the VSE Profile Set of Documents. It introduces processes, lifecycle and standardization concepts, and the ISO/IEC 29110 series. It also introduces the characteristics and requirements of a VSE, and clarifies the rationale for VSE-specific profiles, documents, standards and guides.

ISO/IEC 29110-2 introduces the concepts for software engineering standardized profiles for VSEs, and defines the terms common to the VSE Profile Set of Documents. It establishes the logic behind the definition and application of standardized profiles. It specifies the elements common to all standardized profiles (structure, conformance, assessment) and introduces the taxonomy (catalogue) of ISO/IEC 29110 profiles.

ISO/IEC TR 29110-3 defines the process assessment guidelines and compliance requirements needed to meet the purpose of the defined VSE Profiles. ISO/IEC TR 29110-3 also contains information that can be useful to developers of assessment methods and assessment tools. ISO/IEC TR 29110-3 is addressed to people who have direct relation with the assessment process, e.g. the assessor and the sponsor of the assessment, who need guidance on ensuring that the requirements for performing an assessment have been met.

This part of ISO/IEC 29110 provides the specification for all the profiles of the Generic Profile Group. The Generic Profile Group is applicable to VSEs that do not develop critical software products. The profiles are based on subsets of appropriate standards elements. VSE Profiles apply and are targeted at authors/providers of guides and authors/providers of tools and other support material.

ISO/IEC TR 29110-5-m-n provides an implementation management and engineering guide for the VSE Profile described in ISO/IEC 29110-4-m.

Figure 1 describes the ISO/IEC 29110 series and positions the parts within the framework of reference. Overviews and guides are published as Technical Reports (TR), and profiles are published as International Standards (IS).

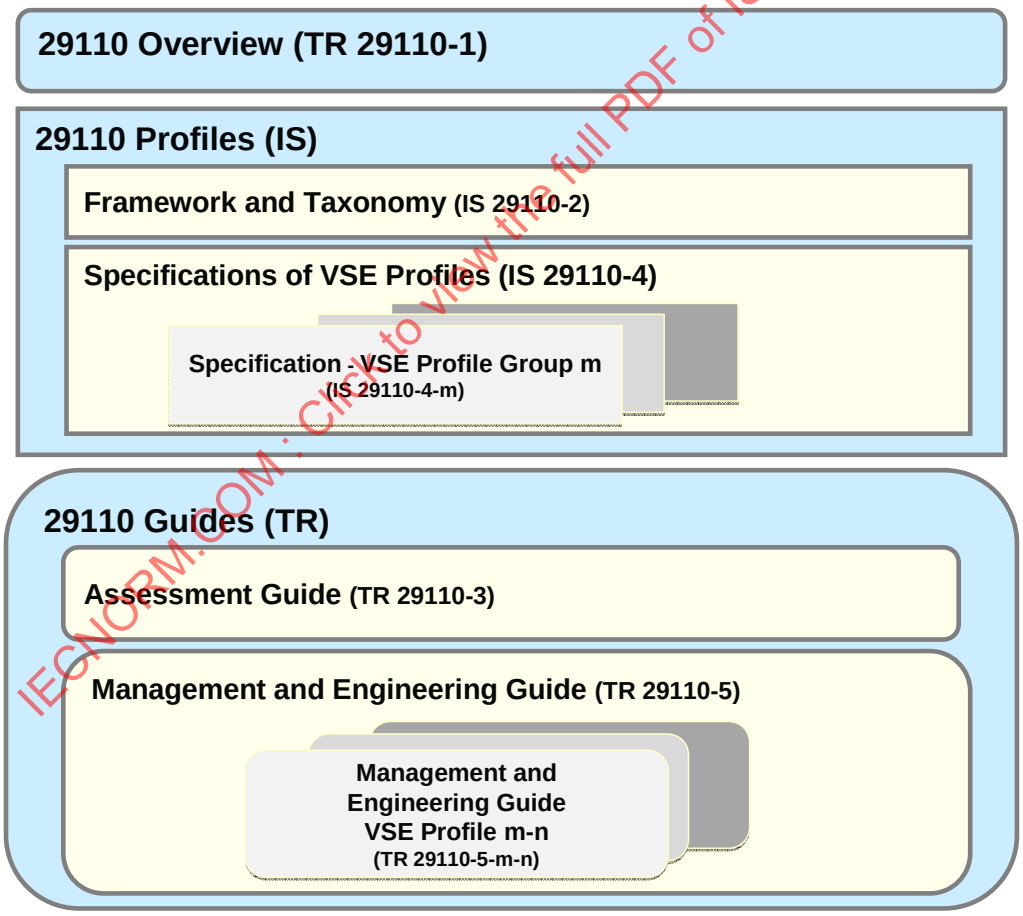

Figure 1 — ISO/IEC 29110 series

Software engineering — Lifecycle profiles for Very Small Entities (VSEs) —

Part 4-1:
Profile specifications: Generic profile group

1 Scope

1.1 Fields of application

ISO/IEC 29110 is applicable to Very Small Entities (VSEs). VSEs are enterprises, organizations, departments or projects up to 25 people. The lifecycle processes described in ISO/IEC 29110 are not intended to preclude or discourage their use by organizations bigger than VSEs.

The lifecycle processes defined in ISO/IEC 29110 can be used by VSEs when acquiring and using, as well as when creating and supplying, a software system. They can be applied at any level in a software system's structure and at any stage in the lifecycle. The processes described in ISO/IEC 29110 are not intended to preclude or discourage the use of additional processes that VSEs find useful.

This part of ISO/IEC 29110 provides a profile specification for the Basic VSE Profile within the Generic Profile Group. The Basic VSE Profile applies to VSEs involved in software development. It selects ISO/IEC 12207 project management and software implementation process elements and ISO/IEC 15289:2006 products from the single project perspective.

Its purpose is to provide the normative and informative links to the subset of ISO/IEC 12207 and ISO/IEC 15289:2006.

1.2 Target audience

This part of ISO/IEC 29110 is targeted at assessors, VSEs that want to claim conformance, authors/providers of guides, and authors/providers of tools and other support material.

2 Conformance

2.1 Conformance situations

This part of ISO/IEC 29110 can be implemented by

— developers of products that facilitate the implementation and the use of this part of ISO/IEC 29110 within organizations;

NOTE Examples of such products are methods, courses, teaching aids, tools, and forms.

— organizations or projects implementing and using the processes and products prescribed by this part of ISO/IEC 29110.

Therefore, conformance can be claimed by developers of products and organizations, with different interpretations, and different conformity assessment methods.

It can be attested by a third party. It can be mandated as part of procurement and contractual processes

2.2 Conformance to this part of ISO/IEC 29110

A VSE that claims conformance to this part of ISO/IEC 29110 shall implement and use all the mandatory profile elements as identified in Clause 7, and the associated properties and requirements as described in the base standards when applicable.

Conformance is achieved by demonstrating that

— mandatory requirements for the lifecycle products (information items) have been satisfied using the content of conformant work products as evidence,

— mandatory requirements for the lifecycle processes have been satisfied using the objectives (outcomes) and products as evidence.

Conformance to this part of ISO/IEC 29110 implies conformance to ISO/IEC 12207 and ISO/IEC 15289:2006, as per their conformance clause that allows partial or tailored conformance.

A product that claims conformance to this part of ISO/IEC 29110 shall implement all the mandatory profile elements as identified in Clause 7, and the associated properties and requirements as described in the base standards when applicable. Conformance is achieved by demonstrating that the conforming product does not exclude, modify or contradict any of the mandatory profile elements.

3 Normative references

The following referenced documents are indispensable for the application 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.

ISO/IEC TR 29110-1, *Software engineering — Lifecycle profiles for Very Small Entities (VSEs) — Part 1: Overview*

ISO/IEC 29110-2, *Software engineering — Lifecycle profiles for Very Small Entities (VSEs) — Part 2: Framework and taxonomy*

ISO/IEC 12207:2008, *Systems and software engineering — Software life cycle processes*

ISO/IEC 15289:2006, *Systems and software engineering — Content of systems and software life cycle process information products (Documentation)*

4 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC TR 29110-1 apply.

5 Conventions and abbreviated terms

5.1 Naming, diagramming and definition conventions

Conventions for naming, diagramming, describing and defining VSE Profiles are defined in ISO/IEC 29110-2.

5.2 Abbreviations

VSE Very Small Entity

VSEs Very Small Entities

6 Description of the Basic VSE Profile

6.1 Preparation of the Basic VSE Profile

The purpose of the Basic VSE Profile is to define a subset of processes and outcomes of ISO/IEC 12207 and products of ISO/IEC 15289:2006 for software implementation and project management. The main reasons to include software implementation and project management are that the VSE core business is software development and their financial success depends on successful project completion within schedule and budget.

The preparation of the Basic VSE Profile follows the next steps:

a) The recognition of VSE characteristics related to: finance, resources, customer interface, internal business processes, learning and growth.

b) The identification of VSE needs and suggested Competencies that derives from those characteristics.

c) The specification of the Basic VSE Profile elements proper to respond to the VSE needs and suggested Competencies according to ISO/IEC 29110-2.

d) The selection and link of the subset of the Basic VSE Profile elements that map to the ISO/IEC 12207 processes and outcomes elements and ISO/IEC 15289:2006 product elements related to the Basic VSE Profile elements.

e) The definition of the Basic VSE Profile Guides: ISO/IEC TR 29110-5-1-2, Management and Engineering Guide for the implementation of Basic VSE Profile.

Figure 2 illustrates the steps to prepare the Basic VSE Profile.

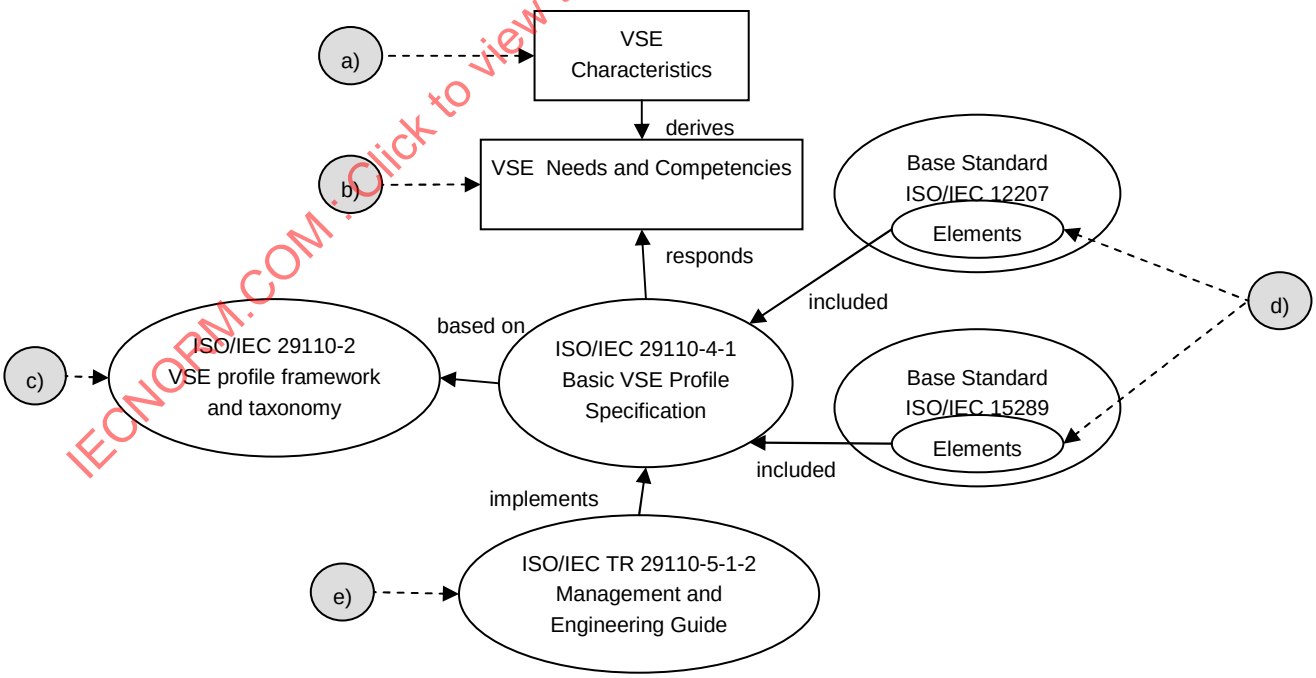

Figure 2 — Basic VSE Profile preparation

The interpretation of the diagram notation is as follows: the rectangle represents the VSE elements; the ellipse represents the standard or a subset of its elements; solid arrow is a labelled relation and circle with dashed arrow is a number of the preparation step.

6.2 Implementation of the Basic VSE Profile

To implement a Basic VSE Profile a contract or agreement with statement of work must be defined based on the customer requirements and supplemented by the business practices / conventions and accepted by the VSE customer.

A VSE software development project follows the VSE Management and Engineering Guide to fulfil the statement of work and to generate the products. VSE can perform other activities to support the project.

Figure 3 illustrates the context of the implementation rationale for the Basic VSE Profile.

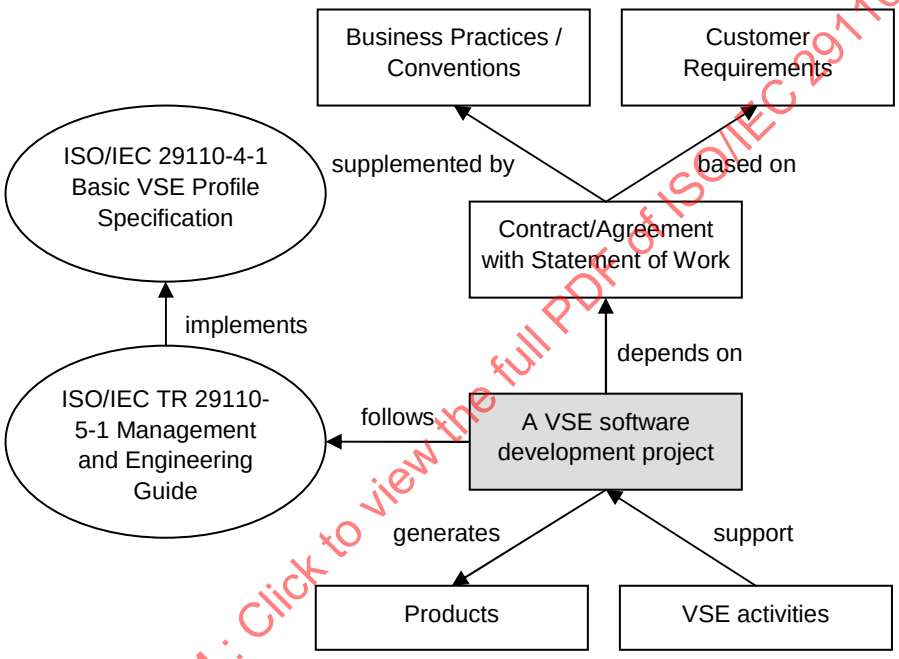

Figure 3 — Context of the implementation rational for Basic VSE Profile

The notation of Figure 3 is similar to Figure 2.

In order to implement the Basic VSE Profile, VSE can follow ISO/IEC TR 29110-5-1-2, which is a collection of selected and structured process elements such as: objectives, activities, tasks, roles and work products; useful for Basic VSE Profile implementation. For concept definition see ISO/IEC TR 29110-5-1-2.

6.3 VSE characteristics, needs and suggested competencies for Basic VSE profile

6.3.1 General

VSEs are subject to a number of characteristics, needs and suggested competencies that affect the contents, the nature and the extent of their activities. The Basic VSE Profile addresses a subset of VSEs which are described through the following characteristics, needs and suggested Competencies, classified in four categories: Finance and Resources, Customer Interface, Internal Business Processes and Learning and Growth.

6.3.2 Finance and resources

6.3.2.1 Characteristics:

a) small number of engineers (e.g. the cost of a payroll up to 25 people);

b) short term cash flow of each project may be critical for VSE;

c) low budget projects that last a few months and involve few people to develop small products;

d) depend on successful project completion within schedule and budget;

e) prefer separate project to perform corrective post delivery maintenance;

f) limited internal resources to perform management, support and organizational processes like risk management, training, quality management, process improvement and reuse.

6.3.2.2 Needs and suggested competencies:

a) perform the projects within the budget and deliver the product on schedule;

b) maintain close communication with the customer to manage risks.

6.3.3 Customer interface

6.3.3.1 Characteristics:

a) usually have one customer per project at a time;

b) customer satisfaction depends on

   1) fulfilment of specific requirements that may change during the project,

   2) timely information during the product development,

   3) delivery on schedule,

   4) low level of defects found post-delivery, and

   5) close communication and prompt responses to any changes.

c) customers usually do not define quantitative quality requirements;

d) a VSE is usually not in charge of the management of the system, and the software integration, installation and operation.

6.3.3.2 Needs and suggested competencies:

a) fulfil customer requirements;

b) manage the change of customer requirements during the project;

c) provide close communication and timely update information to the customer during the product development;

d) deliver the product with low level of defects.

6.3.4 Internal business process

6.3.4.1 Characteristics:

a) The main process is to develop custom software systems written in house on contract.

b) The software product is elaborated progressively and has to be consistent with customer requirements.

c) Products are developed or maintained through projects with a single line of communication between implementation group and customer.

d) The number of engineers in the organization is small (e.g. up to 25 people); therefore most of the communication, decision making and problem resolution can be performed promptly face to face.

e) The VSE has lean Project Management and focused Software Implementation activities.

f) Infrastructure Management, Project Portfolio Management and Human Resource Management Processes are performed through face to face informal mechanisms.

g) Products generated in projects are software items which may have more than one version and have to be saved and control.

6.3.4.2 Needs and suggested competencies:

a) Version control and storage of the products generated during project.

b) progressive elaboration of the software product, achieving consistency with customer requirements.

6.3.5 Learning and growth

6.3.5.1 Characteristics:

a) awareness of the importance of standards;

b) lack of human resources to engage in standardization;

c) lack of information of International Standards;

d) lack of knowledge of software process improvement and process evaluation.

6.3.5.2 Needs and suggested competencies:

a) guidelines, flexible and easy to use for beginners, to adopt practices of International Standards focused on processes to support their software development projects needs.

6.4 VSE needs and suggested competencies related to the Basic VSE profile elements

6.4.1 General

The needs and suggested Competencies are related to Basic VSE Profile elements: processes, objectives and work products, as given in 6.4.2 to 6.4.5.

6.4.2 Needs and suggested competencies derived from finance and resources characteristics

a) Perform the projects within the budget and deliver the product on schedule. To respond to this need and suggested Competencies Basic VSE Profile processes, objectives and work products are:

Project Management Process

PM.O1. The *Project Plan* for the execution of the project is developed according to the *Statement of Work* and validated with the Customer. The tasks and resources necessary to complete the work are sized and estimated.

PM.O2. Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status Record*. Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Appropriate Closure of the project is performed to get the Customer acceptance documented in the *Acceptance Record*.

Software Implementation Process

SI.O1. Tasks of the activities are performed through the accomplishment of the current *Project Plan*.

Work Products: *Statement of Work*, *Progress Status Record, Project Plan, Correction Register* and *Acceptance Record*.

b) Maintain close communication with the customer to manage risks. To respond to this need and suggested Competencies Basic VSE Profile processes, objectives and work products are:

Project Management Process

PM.O5. Risks are identified as they develop and during the conduct of the project.

Work Product: *Project Plan.*

6.4.3 Needs and suggested competencies derived from customer Interface characteristics

a) Fulfil customer requirements. To respond to this need and suggested Competencies Basic VSE Profile processes, objectives and work products are:

Project Management Process

PM.O7. Software Quality Assurance is performed to provide assurance that work products and processes comply with the *Project Plan* and *Requirements Specification*.

Software Implementation Process

SI.O2. Software requirements are defined, analyzed for correctness and testability, approved by the Customer, baselined and communicated.

Work Products: *Requirements Specification*, *Verification Results*, and *Validation Results*.

b) Manage the change of customer requirements during the project. To respond to this need and suggested Competencies Basic VSE Profile processes, objectives and work products are:

Project Management Process

PM.O3. The *Change Requests* are addressed through their reception and analysis. Changes to the software requirements are evaluated for cost, schedule and technical impact.

Work Product: *Change Request*.

c) Provide close communication and timely updated information response to the customer during the product development. To respond to this need and suggested Competencies Basic VSE Profile processes, objectives and work products are:

Project Management Process

PM.O4. Review meetings with the Work Team and the Customer are held. Agreements are registered and tracked.

Work Product: *Meeting Record*.

d) Deliver the product with low level of defects. To respond to this need and suggested Competencies Basic VSE Profile processes, objectives and work products are:

Software Implementation Process

SI.O7. Verification and Validation tasks of all required work products are performed using the defined criteria to achieve consistency among output and input products in each activity. Defects are identified and corrected; records are stored in the *Verification/Validation Results*.

Work Products: *Verification Results*, and *Validation Results*.

6.4.4 Needs and suggested competencies derived from internal business process characteristics

a) Version control and storage of the products generated during the project. To respond to this need and suggested Competencies Basic VSE Profile processes, objectives and work products are:

Project Management Process

PM.O6. A software *Version Control Strategy* is developed. Items of *Software Configuration* are identified, defined and baselined. Modifications and releases of the items are controlled and made available to the Customer and Work Team including the storage, handling and delivery of the items.

Work Products: *Project Repository* and *Project Repository Backup*.

b) Elaborate progressively the software product, achieving consistency with customer requirements. To respond to this need and suggested Competencies Basic VSE Profile processes, objectives and work products are:

Software Implementation Process

SI.O3. Software architectural and detailed design is developed and baselined. It describes the software items and internal and external interfaces of them. Consistency and traceability to software requirements are established.

SI.O4. Software components defined by the design are produced. Unit test are defined and performed to verify the consistency with requirements and the design. Traceability to the requirements and design are established.

SI.O5. *Software* is produced performing integration of software components and verified using *Test Cases and Test Procedures*. Results are recorded at the *Test Report*. Defects are corrected and consistency and traceability to *Software Design* are established.

SI.O6. A *Software Configuration*, that meets the *Requirements Specification* as agreed to with the Customer, which includes user, operation and maintenance documentations is integrated, baselined and stored at the *Project Repository*. Needs for changes to the *Software Configuration* are detected and related *Change Requests* are initiated.

Work Products: *Software Components*, *Test Report*, *Maintenance Documentation*, *Product Operation Guide*, *Software*, *Software Configuration*, *Software Design*, *Software User Documentation*, *Test Cases and Test Procedures* and *Traceability Record*.

6.4.5 Needs and suggested competencies derived from learning and growth characteristics

a) Guidelines, flexible and easy to use for beginners, to adopt practices of international standards focused on processes to support their software development projects needs. To respond to this need and suggested Competencies Basic VSE Profile has:

The Management and Engineering Guide ISO/IEC 29110 5-1-2 that supports the implementation of Basic VSE Profile, useful for software development and project management, through a process description which integrates purposes, objectives, outcomes, activities, tasks, products and roles within explicit workflows.

6.5 Basic VSE profile elements

Basic VSE Profile is composed by Project Management (PM) and Software Implementation (SI) processes with its corresponding objectives (identified as PM.O1, PM.O2, etc; and SI.O1, SI.O2, etc) and work products.

Project Management Process

PM.O1. The *Project Plan* for the execution of the project is developed according to the *Statement of Work* and validated with the Customer. The tasks and resources necessary to complete the work are sized and estimated.

PM.O2. Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status Record.* Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Customer acceptance documented in the *Acceptance Record*.

PM.O3. The *Change Requests* are addressed through their reception and analysis. Changes to the software requirements are evaluated for cost, schedule and technical impact.

PM.O4. Review meetings with the Work Team and the Customer are held. Agreements are registered and tracked.

PM.O5. Risks are identified as they develop and during the conduct of the project.

PM.O6. A software *Version Control Strategy* is developed. Items of *Software Configuration* are identified, defined and baselined. Modifications and releases of the items are controlled and made available to the Customer and Work Team including the storage, handling and delivery of the items.

PM.O7. Software Quality Assurance is performed to provide assurance that work products and processes comply with the *Project Plan* and *Requirements Specification*.

Work Products: *Statement of Work, Progress Status Record, Project Plan, Change Requests, Meeting Record, Correction Register, Verification Results, Validation Results Project Repository, Project Repository Backup* and *Acceptance Record*.

Software Implementation Process

SI.O1. Tasks of the activities are performed through the accomplishment of the current *Project Plan*.

SI.O2. Software requirements are defined, analyzed for correctness and testability, approved by the Customer, baselined and communicated.

SI.O3. Software architectural and detailed design is developed and baselined. It describes the software items and internal and external interfaces of them. Consistency and traceability to software requirements are established.

SI.O4. Software components defined by the design are produced. Unit test are defined and performed to verify the consistency with requirements and the design. Traceability to the requirements and design are established.

SI.O5. *Software* is produced performing integration of software components and verified using *Test Cases and Test Procedures*. Results are recorded at the *Test Report*. Defects are corrected and consistency and traceability to *Software Design* are established.

SI.O6. A *Software Configuration*, that meets the *Requirements Specification* as agreed to with the Customer, which includes user, operation and maintenance documentations is integrated, baselined and stored at the *Project Repository*. Needs for changes to the *Software Configuration* are detected and related *Change Requests* are initiated

SI.O7. Verification and Validation tasks of all required work products are performed using the defined criteria to achieve consistency among output and input products in each activity. Defects are identified and corrected; records are stored in the *Verification/Validation Results*.

Work Product: *Requirements Specification, Components, Test Report, Maintenance Documentation, Product Operation Guide, Software, Software Configuration, Software Design, Software User Documentation, Test Cases and Test Procedures, Traceability Record, Verification Results* and *Validation Results*.

6.6 Basic VSE profile coverage of ISO/IEC 12207 processes

The presentation of coverage from Basic VSE Profile to ISO/IEC 12207 processes and outcomes, and to ISO/IEC 15289:2006 products are described in Clause 7,

6.7 Entry conditions for Basic VSE profile use

To use the Basic VSE Profile, it is assumed that the VSE already fulfills the following conditions:

a) There is a project contract or agreement with statement of work.

b) The cost, technical, and schedule feasibility was performed before the project start.

c) Thr project working team, including project manager, is assigned and trained

d) Goods, services and infrastructure are available.

7 Basic VSE profile specifications

7.1 Introduction

This clause contains the specification of the standardized profile in the form of tables. The explanation of the column names and contents is stated in ISO/IEC 29110-2:2010, clause 10. It contains the specification for the following profile elements:

— In clause 7.2 Process definition and composition specification;

— In clause 7.3 Process objectives specification;

— In clause 7.4 Work product specifications;

— In clause 7.5 Activity input & output specification.

Each of the lines in these tables expresses a requirement on the implementation of this profile. For conformity assessment purposes, each of these requirements is qualified (in the Conformity Type column) as a mandatory requirement (MAN) or an optional requirement (OPT). In summary:

— In clause 7.2 Process definition and composition specification:

  — All processes are mandatory.

  — All activities are mandatory.

  — All tasks are optional.

— In clause 7.3 Process objectives specification:

  — All objectives are mandatory.

— In clause 7.4 Work product specifications:

  — All work products are mandatory.

— In clause 7,5 Activity input & output specification:

  — All outputs are mandatory.

  — All inputs are optional.

7.2 Process definition and composition specification

7.2.1 Process PM – Project Management

These columns and associated values are common to all rows in the following specification table, and therefore not repeated.

Table 2 — PM - Project Management Process

Profile Document ID	Target Capability Level	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
29110-4-1	1	Process	PM	Project Management

Table 3 — PM - Project Management activities

Profile Process Identification and Composition			
Profile Conf. Type	**Profile Element2 Type**	**Profile Element2 ID**	**Profile Element2 Name**
MAN	Activity	PM.1	Project Planning
MAN	Activity	PM.2	Project Plan Execution
MAN	Activity	PM.3	Project Assessment and Control
MAN	Activity	PM.4	Project Closure

Table 4 — PM - Project Management tasks

Profile Process Identification and Composition						
Profile Conf. Type	**Profile Element2 Type**	**Profile Element2 ID**	**Profile Element2 Name**	**Profile Element3 Type**	**Profile Element3 ID**	**Profile Element3 Name**
MAN	***Activity***	***PM.1***	***Project Planning,***			
OPT	"	"	"	Task	PM.1.1	Review the *Statement of Work*
OPT	"	"	"	Task	PM.1.2	Define with the Customer the *Delivery Instructions* of each one of the deliverables specified in the *Statement of Work*.
OPT	"	"	"	Task	PM.1.3	Identify the specific tasks to be performed in order to produce the deliverables and their software components identified in the *Statement of Work.* Include tasks in the SI process along with verification, validation and reviews with Customer and Work Team tasks to assure the quality of work products. Identify the tasks to perform the *Delivery Instructions.* Document the *Tasks.*
OPT	"	"	"	Task	PM.1.4	Establish the *Estimated Duration* to perform each task.
OPT	"	"	"	Task	PM.1.5	Identify and document the resources: human, material, equipment and tools, standards, including the required training of the Work Team to perform the project. Include in the schedule the dates when resources and training will be needed.
OPT	"	"	"	Task	PM.1.6	Establish the *Composition of Work Team* assigning roles and responsibilities according to the *Resources*.
OPT	"	"	"	Task	PM.1.7	Assign estimated start and completion dates to each one of the tasks in order to create the *Schedule of the Project Tasks* taking into account the assigned resources, sequence and dependency of the tasks.
OPT	"	"	"	Task	PM.1.8	Calculate and document the project *Estimated Effort and Cost*.
OPT	"	"	"	Task	PM.1.9	Identify and document the risks which may affect the project.
OPT	"	"	"	Task	PM.1.10	Document the *Version Control Strategy* for the project.
OPT	"	"	"	Task	PM.1.11	Generate the *Project Plan* integrating the elements previously identified and documented.
OPT	"	"	"	Task	PM.1.12	Include product description, scope, objectives and deliverables in the *Project Plan*.
OPT	"	"	"	Task	PM.1.13	Verify and obtain approval of the *Project Plan*. Verify that all *Project Plan* elements are viable and consistent. The results found are documented in a *Verification Results* and corrections are made until the document is approved by PM
OPT	"	"	"	Task	PM.1.14	Review and accept the *Project Plan*. Customer reviews and accepts the *Project Plan*, making sure that the *Project Plan* elements match with the *Statement of Work*
OPT	"	"	"	Task	PM.1.15	Establish the project repository using the *Version Control Strategy*.
MAN	***Activity***	***PM.2***	***Project Plan Execution***			
OPT	"	"	"	Task	PM.2.1	Monitor the *Project Plan* execution and record actual data in *Progress Status Record*.
OPT	"	"	"	Task	PM.2.2	Analyze and evaluate the *Change Request* for cost, schedule and technical impact. The *Change Request* can be initiated externally by the Customer or internally by the Work Team. Update the *Project Plan*, if the accepted change does not affect agreements with Customer. *Change Request*, which affects those agreements, needs to be negotiated by both parties (see PM.2.4).

Profile Process Identification and Composition						
Profile Conf. Type	**Profile Element2 Type**	**Profile Element2 ID**	**Profile Element2 Name**	**Profile Element3 Type**	**Profile Element3 ID**	**Profile Element3 Name**
OPT	"	"	"	Task	PM.2.3	Conduct revision meetings with the Work Team, identify problems, review risk status, record agreements and track them to closure.
OPT	"	"	"	Task	PM.2.4	Conduct revision meetings with the Customer, record agreements and track them to closure. *Change Request* initiated by Customer or initiated by Work Team, which affects the Customer, needs to be negotiated to reach acceptance of both parties. If necessary, update the *Project Plan* according to new agreement with Customer.
OPT	"	"	"	Task	PM.2.5	Perform backup according to the *Version Control Strategy*.
OPT	"	"	"	Task	PM.2.6	Perform *Project Repository* recovery using the *Project Repository Backup*, if necessary.
MAN	***Activity***	***PM.3***	***Project Assessment and Control***			
OPT	"	"	"	Task	PM.3.1	Evaluate project progress with respect to the *Project Plan*, comparing: -actual tasks against planned tasks -actual results against established project objectives -actual resource allocation against planned resources -actual cost against budget estimates -actual time against planned schedule -actual risk against previously identified
OPT	"	"	"	Task	PM.3.2	Establish actions to correct deviations or problems and identified risks concerning the accomplishment of the plan, as needed, document them in *Correction Register* and track them to closure.
OPT	"	"	"	Task	PM.3.3	Identify changes to requirements and/or *Project Plan* to address major deviations, potential risks or problems concerning the accomplishment of the plan, document them in *Change Request* and track them to closure.
MAN	***Activity***	***PM.4***	***Project Closure***			
OPT	"	"	"	Task	PM.4.1	Formalize the completion of the project according to the *Delivery Instructions* established in the *Project Plan,* providing acceptance support and getting the *Acceptance Record* signed.
OPT	"	"	"	Task	PM.4.2	Update *Project Repository*

7.2.2 Process SI – Software Implementation

These columns and associated values are common to all rows in the following specification table, and therefore not repeated.

Table 5 — SI - Software Implementation process

Profile Document ID	Target Capability Level	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
29110-4-1	1	Process	SI	Software Implementation

Table 6 — SI – Software Implementation activities

Profile Process Identification and Composition			
Profile Conf. Type	**Profile Element2 Type**	**Profile Element2 ID**	**Profile Element2 Name**
MAN	Activity	SI.1	Software Implementation Initiation
MAN	Activity	SI.2	Software Requirements Analysis
MAN	Activity	SI.3	Software Architectural and Detailed Design
MAN	Activity	SI.4	Software Construction
MAN	Activity	SI.5	Software Integration and Tests
MAN	Activity	SI.6	Product Delivery

Table 7 — SI - Software Implementation tasks

Profile Process Identification and Composition						
Profile Conf. Type	**Profile Element2 Type**	**Profile Element2 ID**	**Profile Element2 Name**	**Profile Element3 Type**	**Profile Element3 ID**	**Profile Element3 Name**
MAN	***Activity***	***SI.1***	***Software Implementation Initiation***			
OPT	"	"	"	Task	SI.1.1	Revision of the current *Project Plan* with the Work Team members in order to achieve a common understanding and get their engagement with the project.
OPT	"	"	"	Task	SI.1.2	Set or update the implementation environment.
MAN	***Activity***	***SI.2***	***Software Requirements Analysis***			
OPT	"	"	"	Task	SI.2.1	Assign tasks to the Work Team members in accordance with their role, based on the current *Project Plan*.
OPT	"	"	"	Task	SI.2.2	Document or update the *Requirements Specification.* Identify and consult information sources (customer, users, previous systems, documents, etc.) in order to get new requirements. Analyze the identified requirements to determinate the scope and feasibility. Generate or update the *Requirements Specification.*
OPT	"	"	"	Task	SI.2.3	Verify and obtain approval of the *Requirements Specification.* Verify the correctness and testability of the *Requirements Specification* and its consistency with the *Product Description*. Additionally, review that requirements are complete, unambiguous and not contradictory. The results found are documented in a *Verification Results* and corrections are made until the document is approved by AN. If significant changes were needed, initiate a *Change Request.*
OPT	"	"	"	Task	SI.2.4	Validate and obtain approval of the *Requirements Specification.* Validate that *Requirements Specification* satisfies needs and agreed upon expectations, including the user interface usability. The results found are documented in a *Validation Results* and corrections are made until the document is approved by the CUS.

Profile Process Identification and Composition						
Profile Conf. Type	**Profile Element2 Type**	**Profile Element2 ID**	**Profile Element2 Name**	**Profile Element3 Type**	**Profile Element3 ID**	**Profile Element3 Name**
OPT	"	"	"	Task	SI.2.5	Document the preliminary version of the *Software User Documentation* or update the present manual. (if appropriate)
OPT	"	"	"	Task	SI.2.6	Verify and obtain approval of the *Software User Documentation.* Verify consistency of the *Software User Documentation* with the *Requirements Specification*. The results found are documented in a *Verification Results* and corrections are made until the document is approved by AN. If significant changes were needed, initiate a *Change Request.* (if appropriate)
OPT	"	"	"	Task	SI.2.7	Incorporate the *Requirements Specification,* and **Software User Documentation* to the *Software Configuration* in the baseline. *(if appropriate)
MAN	***Activity***	***SI.3***	***Software Architectural and Detailed Design***	Activity	SI.3	Software Architectural and Detailed Design
OPT	"	"	"	Task	SI.3.1	Assign tasks to the Work Team members related to their role according to the current *Project Plan.*
OPT	"	"	"	Task	SI.3.2	Understand *Requirements Specifications.*
OPT	"	"	"	Task	SI.3.3	Document or update the *Software Design.* Analyze the *Requirements Specification* to generate the architectural design, its arrangement in subsystems and software components defining the internal and external interfaces. Describe in detail, the appearance and the behavior of the interface, based on the *Requirements Specification* in a way that resources for its implementation can be foreseen. Provide the detail of software components and their interfaces to allow the construction in an evident way. Generate or update the *Traceability Record.*
OPT	"	"	"	Task	SI.3.4	Verify and obtain approval of the *Software Design.* Verify correctness of *Software Design* documentation, its feasibility and consistency with their *Requirements Specification*. Verify that the *Traceability Record* contains the adequate relationships between requirements and the *Software Design* elements. The results found are documented in a *Verification Results* and corrections are made until the document is approved by AN. If significant changes were needed, initiate a *Change Request*.
OPT	"	"	"	Task	SI.3.5	Establish or update *Test Cases and Test Procedures* for integration testing based on *Requirements Specification* and *Software Design.* Customer provides testing data, if needed.

Profile Process Identification and Composition						
Profile Conf. Type	**Profile Element2 Type**	**Profile Element2 ID**	**Profile Element2 Name**	**Profile Element3 Type**	**Profile Element3 ID**	**Profile Element3 Name**
OPT	"	"	"	Task	SI.3.6	Verify and obtain approval of the *Test Cases and Test Procedures.* Verify consistency among *Requirements Specification*, *Software Design* and *Test Cases and Test Procedures*. The results found are documented in a *Verification Results* and corrections are made until the document is approved by AN.
OPT	"	"	"	Task	SI.3.7	Update the *Traceability Record* incorporating the *Test Cases and Test Procedures.*
OPT	"	"	"	Task	SI.3.8	Incorporate the *Software Design and Traceability Record* to the *Software Configuration* as part of the baseline. Incorporate the *Test Cases, and Test Procedures* to the *Project Repository*.
MAN	***Activity***	***SI.4***	***Software Construction***			
OPT	"	"	"	Task	SI.4.1	Assign tasks to the Work Team members related to their role, according to the current *Project Plan.*
OPT	"	"	"	Task	SI.4.2	Understand *Software Design.*
OPT	"	"	"	Task	SI.4.3	Construct or update *Software Components* based on the detailed part of the *Software Design*.
OPT	"	"	"	Task	SI.4.4	Design or update unit test cases and apply them to verify that the *Software Components* implements the detailed part of the *Software Design.*
OPT	"	"	"	Task	SI.4.5	Correct the defects found until successful unit test (reaching exit criteria) is achieved.
OPT	"	"	"	Task	SI.4.6	Update the *Traceability Record* incorporating *Software Components* constructed or modified.
OPT	"	"	"	Task	SI.4.7	Incorporate *Software Components* and *Traceability Record* to the *Software Configuration* as part of the baseline
MAN	***Activity***	***SI.5***	***Software Integration and Tests***			
OPT	"	"	"	Task	SI.5.1	Assign tasks to the work team members related to their role, according to the current *Project Plan.*
OPT	"	"	"	Task	SI.5.2	Understand *Test Cases and Test Procedures.* Set or update the testing environment.
OPT	"	"	"	Task	SI.5.3	Integrates the *Software* using *Software Components* and updates Test Cases and Test Procedures for integration testing, as needed.
OPT	"	"	"	Task	SI.5.4	Perform *Software* tests using *Test Cases and Test Procedures* for integration and software product and document results in *Test Report*.
OPT	"	"	"	Task	SI.5.5	Correct the defects found and perform regression test until exit criteria is achieved.
OPT	"	"	"	Task	SI.5.6	Updates the *Traceability Record,* if appropriate.
OPT	"	"	"	Task	SI.5.7	Document the *Product Operation Guide* or update the current guide, if appropriate.
OPT	"	"	"	Task	SI.5.8	Verify and obtain approval of the *Product Operation Guide*, if appropriate (see SI.5.7) Verify consistency of the *Product Operation Guide* with the *Software*. The results found are documented in a *Verification Results* and corrections are made until the document is approved by DES.

Profile Process Identification and Composition						
Profile Conf. Type	**Profile Element2 Type**	**Profile Element2 ID**	**Profile Element2 Name**	**Profile Element3 Type**	**Profile Element3 ID**	**Profile Element3 Name**
OPT	"	"	"	Task	SI.5.9	Document the *Software User Documentation* or update the current one, if appropriate.
OPT	"	"	"	Task	SI.5.10	Verify and obtain approval of the *Software User Documentation,* if appropriate (see SI.5.9) Verify consistency of the *Software User Documentation* with the *Software*. The results found are documented in a *Verification Results* and corrections are made until the document is approved by CUS.
OPT	"	"	"	Task	SI.5.11	Incorporate the *Test Cases and Test Procedures, Software, Traceability Record, Test Report, Product Operation Guide and Software User Documentation* to the *Software Configuration* as part of the baseline.
MAN	***Activity***	***SI.6***	***Product Delivery***			
OPT	"	"	"	Task	SI.6.1	Assign tasks to the work team members related to their role, according to the current *Project Plan.*
OPT	"	"	"	Task	SI.6.2	Understand *Software Configuration.*
OPT	"	"	"	Task	SI.6.3	Document the *Maintenance Documentation* or update the current one.
OPT	"	"	"	Task	SI.6.4	Verify and obtain approval of the *Maintenance Documentation.* Verify consistency of *Maintenance Documentation* with *Software Configuration*. The results found are documented in a *Verification Results* and corrections are made until the document is approved by TL.
OPT	"	"	"	Task	SI.6.5	Incorporate the *Maintenance Documentation* as baseline for the *Software Configuration.*
OPT	"	"	"	Task	SI.6.6	Perform delivery according to *Delivery Instructions*

7.3 Process objectives specification

7.3.1 Process PM – Project Management

These columns and associated values are common to all rows in the following specification table, and therefore not repeated.

Table 8 — PM - Project Management Conformity Type

Profile Document ID	Target Conformity Type	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
29110-4-1	MAN	Process	PM	Project Management

Table 9 — PM - Project Management objectives

Profile Process Objectives		
Profile Element2 Type	**Profile Element2 ID**	**Profile Element2 Name**
Objectives	PM.O1.	The *Project Plan* for the execution of the project is developed according to the *Statement of Work* and review and accepted by the Customer. The tasks and resources necessary to complete the work are sized and estimated.
Objectives	PM.O2.	Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status Record.* Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Customer acceptance documented in the *Acceptance Record*.
Objectives	PM.O3.	The *Change Requests* are addressed through their reception and analysis. Changes to the software requirements are evaluated for cost, schedule and technical impact.
Objectives	PM.O4.	Review meetings with the Work Team and the Customer are held. Agreements are registered and tracked.
Objectives	PM.O5.	Risks are identified as they develop and during the conduct of the project.
Objectives	PM.O6.	A software *Version Control Strategy* is developed. Items of *Software Configuration* are identified, defined and baselined. Modifications and releases of the items are controlled and made available to the Customer and Work Team. The storage, handling and delivery of the items are controlled.
Objectives	PM.O7.	Software Quality Assurance is performed to provide assurance that work products and processes comply with the *Project Plan* and *Requirements Specification*.

7.3.2 Process SI – Software Implementation

These columns and associated values are common to all rows in the following specification table, and therefore not repeated.

Table 10 — SI – Software Implementation Conformity Type

Profile Document ID	Profile Conf. Type	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
29110-4-1	MAN	Process	SI	Software Implementation

Table 11 — SI – Software Implementation objectives

Profile Process Objectives		
Profile Element2 Type	**Profile Element2 ID**	**Profile Element2 Name**
Objectives	SI.O1.	Tasks of the activities are performed through the accomplishment of the current *Project Plan*.
Objectives	SI.O2.	Software requirements are defined, analyzed for correctness and testability, approved by the Customer, baselined and communicated.
Objectives	SI.O3.	Software architectural and detailed design is developed and baselined. It describes the software components and internal and external interfaces of them. Consistency and traceability to software requirements are established.
Objectives	SI.O4.	Software components defined by the design are produced. Unit test are defined and performed to verify the consistency with requirements and the design. Traceability to the requirements and design are established.
Objectives	SI.O5.	Software is produced performing integration of software components and verified using *Test Cases and Test Procedures*. Results are recorded at the *Test Report*. Defects are corrected and consistency and traceability to *Software Design* are established.

Profile Process Objectives		
Profile Element2 Type	**Profile Element2 ID**	**Profile Element2 Name**
Objectives	SI.O6.	A *Software Configuration*, that meets the *Requirements Specification* as agreed to with the Customer, which includes user, operation and maintenance documentations is integrated, baselined and stored at the *Project Repository*. Needs for changes to the *Software Configuration* are detected and related *Change Requests* are initiated
Objectives	SI.O7.	Verification and Validation tasks of all required work products are performed using the defined criteria to achieve consistency among output and input products in each activity. Defects are identified and corrected; records are stored in the *Verification/Validation Results*.

7.4 Work product specifications

These columns and associated values are common to all rows in the following specification table, and therefore not repeated. For work products description see ISO/IEC 29110-5-1-2.

Table 12 — Work products Conformity Type

Profile Document ID	Profile Conf. Type
29110-4-1	MAN

Table 13 — Work products

Profile Work products		
Profile Element1 Type	**Profile Element1 ID**	**Profile Element1 Name**
Work product	1	Acceptance Record
Work product	2	Change Request
Work product	3	Correction Register
Work product	4	Maintenance Documentation
Work product	5	Meeting Record
Work product	6	Product Operation Guide
Work product	7	Progress Status Record
Work product	8	Project Plan
Work product	9	Project Repository
Work product	10	Project Repository Backup
Work product	11	Requirements Specification
Work product	12	Software
Work product	13	Software Component
Work product	14	Software Configuration
Work product	15	Software Design
Work product	16	Software User Documentation
Work product	17	Statement of Work
Work product	18	Test Cases and Test Procedures
Work product	19	Test Report
Work product	20	Traceability Record
Work product	21	Verification Results
Work product	22	Validation Results

7.5 Activity input & output specification

7.5.1 Process PM – Project Management input & output

These columns and associated values are common to all rows in the following specification table, and therefore not repeated.

Table 14 — PM - Project Management Process

Profile Document ID	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
29110-4-1	Process	PM	Project Management

Table 15 — PM - Project Management activity input & outpu

Profile Process and Activity Identification				Rel.	Profile Input & Output/Internal Work product Identification			
Profile Conf. Type	Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Input /Output /Internal	Profile Document ID	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
OPT	Activity	PM.1	Project Planning,	INP	29110-4-1	Work product	17	Statement of Work
MAN	Activity	PM.1	Project Planning,	OUT	29110-4-1	Work product	8	Project Plan
MAN	Activity	PM.1	Project Planning	OUT	29110-4-1	Work product	5	Meeting Record
MAN	Activity	PM.1	Project Planning,	OUT	29110-4-1	Work product	9	Project Repository
OPT	Activity	PM.2	Project Plan Execution	INP	29110-4-1	Work product	2	Change Request
OPT	Activity	PM.2	Project Plan Execution	INP	29110-4-1	Work product	8	Project Plan
MAN	Activity	PM.2	Project Plan Execution	OUT	29110-4-1	Work product	2	Change Request
MAN	Activity	PM.2	Project Plan Execution	OUT	29110-4-1	Work product	5	Meeting Record
MAN	Activity	PM.2	Project Plan Execution	OUT	29110-4-1	Work product	7	Progress Status Record
MAN	Activity	PM.2	Project Plan Execution	OUT	29110-4-1	Work product	8	Project Plan
MAN	Activity	PM.2	Project Plan Execution	OUT	29110-4-1	Work product	10	Project Repository Backup
OPT	Activity	PM.3	Project assessment and control	INP	29110-4-1	Work product	7	Progress Status Record
OPT	Activity	PM.3	Project assessment and control	INP	29110-4-1	Work product	8	Project Plan
MAN	Activity	PM.3	Project assessment and control	OUT	29110-4-1	Work product	2	Change Requests
MAN	Activity	PM.3	Project assessment and control	OUT	29110-4-1	Work product	3	Correction Register
MAN	Activity	PM.3	Project assessment and control	OUT	29110-4-1	Work product	7	Progress Status Record
OPT	Activity	PM.4	Project Closure	INP	29110-4-1	Work product	8	Project Plan
OPT	Activity	PM.4	Project Closure	INP	29110-4-1	Work product	14	Software Configuration
MAN	Activity	PM.4	Project Closure	OUT	29110-4-1	Work product	1	Acceptance Record
MAN	Activity	PM.4	Project Closure	OUT	29110-4-1	Work product	14	Software Configuration
MAN	Activity	PM.4	Project Closure	OUT	29110-4-1	Work product	9	Project Repository

7.5.2 Process SI – Software Implementation input & output

These columns and associated values are common to all rows in the following specification table, and therefore not repeated.

Table 16 — SI - Software Implementation Process

Profile Document ID	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
29110-4-1	Process	SI	Software Implementation

Table 17 — SI – Software Implementation input & output

Profile Process and Activity Identification				Rel.	Profile Input & output Work product Identification			
Profile Conf. Type	Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Input /Output /Internal	Profile Document ID	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
OPT	Activity	SI.1	Software Implementation Initiation	INP	29110-4-1	Work product	8	Project Plan
OPT	Activity	SI.2	Software Requirements Analysis	INP	29110-4-1	Work product	8	Project Plan
MAN	Activity	SI.2	Software Requirements Analysis	OUT	29110-4-1	Work product	2	Change Request
MAN	Activity	SI.2	Software Requirements Analysis	OUT	29110-4-1	Work product	11	Requirements Specification
MAN	Activity	SI.2	Software Requirements Analysis	OUT	29110-4-1	Work product	14	Software Configuration
MAN	Activity	SI.2	Software Requirements Analysis	OUT	29110-4-1	Work product	16	Software User Documentation
MAN	Activity	SI.2	Software Requirements Analysis	OUT	29110-4-1	Work product	22	Validation Results
MAN	Activity	SI.2	Software Requirements Analysis	OUT	29110-4-1	Work product	21	Verification Results
OPT	Activity	SI.3	Software Architectural and Detailed Design	INP	29110-4-1	Work product	8	Project Plan
OPT	Activity	SI.3	Software Architectural and Detailed Design	INP	29110-4-1	Work product	11	Requirements Specification
MAN	Activity	SI.3	Software Architectural and Detailed Design	OUT	29110-4-1	Work product	2	Change Request
MAN	Activity	SI.3	Software Architectural and Detailed Design	OUT	29110-4-1	Work product	15	Software Design
MAN	Activity	SI.3	Software Architectural and Detailed Design	OUT	29110-4-1	Work product	18	Test Cases and Test Procedures

Profile Process and Activity Identification				Rel.	Profile Input & output Work product Identification			
Profile Conf. Type	**Profile Element2 Type**	**Profile Element2 ID**	**Profile Element2 Name**	**Input /Output /Internal**	**Profile Document ID**	**Profile Element1 Type**	**Profile Element1 ID**	**Profile Element1 Name**
MAN	Activity	SI.3	Software Architectural and Detailed Design	OUT	29110-4-1	Work product	20	Traceability Record
MAN	Activity	SI.3	Software Architectural and Detailed Design	OUT	29110-4-1	Work product	21	Verification Results
MAN	Activity	SI.3	Software Architectural and Detailed Design	OUT	29110-4-1	Work product	14	Software Configuration
OPT	Activity	SI.4	Software Construction	INP	29110-4-1	Work product	8	Project Plan
OPT	Activity	SI.4	Software Construction	INP	29110-4-1	Work product	15	Software Design
OPT	Activity	SI.4	Software Construction	INP	29110-4-1	Work product	20	Traceability Record
MAN	Activity	SI.4	Software Construction	OUT	29110-4-1	Work product	13	Software Components
MAN	Activity	SI.4	Software Construction	OUT	29110-4-1	Work product	20	Traceability Record
MAN	Activity	SI.4	Software Construction	OUT	29110-4-1	Work product	14	Software Configuration
OPT	Activity	SI.5	Software Integration and Tests	INP	29110-4-1	Work product	13	Software Components
OPT	Activity	SI.5	Software Integration and Tests	INP	29110-4-1	Work product	8	Project Plan
OPT	Activity	SI.5	Software Integration and Tests	INP	29110-4-1	Work product	16	Software User Documentation
OPT	Activity	SI.5	Software Integration and Tests	INP	29110-4-1	Work product	18	Test Cases and Test Procedures
OPT	Activity	SI.5	Software Integration and Tests	INP	29110-4-1	Work product	20	Traceability Record
MAN	Activity	SI.5	Software Integration and Tests	OUT	29110-4-1	Work product	13	Software Components
MAN	Activity	SI.5	Software Integration and Tests	OUT	29110-4-1	Work product	6	Product Operation Guide
MAN	Activity	SI.5	Software Integration and Tests	OUT	29110-4-1	Work product	12	Software
MAN	Activity	SI.5	Software Integration and Tests	OUT	29110-4-1	Work product	14	Software Configuration
MAN	Activity	SI.5	Software Integration and Tests	OUT	29110-4-1	Work product	16	Software User Documentation
MAN	Activity	SI.5	Software Integration and Tests	OUT	29110-4-1	Work product	18	Test Cases and Test Procedures

Profile Process and Activity Identification				Rel.	Profile Input & output Work product Identification			
Profile Conf. Type	Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Input /Output /Internal	Profile Document ID	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
MAN	Activity	SI.5	Software Integration and Tests	OUT	29110-4-1	Work product	19	Test Report
MAN	Activity	SI.5	Software Integration and Tests	OUT	29110-4-1	Work product	20	Traceability Record
MAN	Activity	SI.5	Software Integration and Tests	OUT	29110-4-1	Work product	21	Verification Results
OPT	Activity	SI.6	Product Delivery	INP	29110-4-1	Work product	8	Project Plan
OPT	Activity	SI.6	Product Delivery	INP	29110-4-1	Work product	14	Software Configuration
MAN	Activity	SI.6	Product Delivery	OUT	29110-4-1	Work product	4	Maintenance Documentation
MAN	Activity	SI.6	Product Delivery	OUT	29110-4-1	Work product	14	Software Configuration
MAN	Activity	SI.6	Product Delivery	OUT	29110-4-1	Work product	20	Verification Results

8 Basic VSE profile base document references

8.1 Introduction

This clause establishes the reference between the standardized profile elements and the source standards, in the forms of tables. The explanation of the column names and contents is stated in ISO/IEC 29110-2 clause 10. It contains only the profile elements that have such references for the following profile elements;

— In clause 8.2 Process definition and composition references;

— In clause 8.3 Process objectives references;

— In clause 8.4 Work product references;

According to this, some profiles elements are not included in the tables.

8.2 Process definition and composition references

8.2.1 Process PM – Project Management

Table 18 — PM - Project Management process

Profile Process Identification and Composition			Process Source Document References				
Profile Element1 Type	Profile Element1 ID	Profile Element1 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name
Process	PM	Project Management	MAN	ISO/IEC 12207:2008	Process	6.3.1	Project Planning

These columns and associated values are common to all rows in the following specification table, and therefore not repeated.

Table 19 — PM - Project Management process

Profile Document ID	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
29110-4-1	Process	PM	Project Management

Table 20 — PM - Project Management activities

Profile Process Identification and Composition			Process Source Document References							
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name
Activity	PM.1	Project Planning,	OPT	ISO/IEC 12207:2008	Process	6.3.1	Project Planning	Activity	6.3.1.3.2	Project Planning
Activity	PM.2	Project Plan Execution	MAN	ISO/IEC 12207:2008	Process	6.4.8	Software Acceptance Support			
Activity	PM.2	Project Plan Execution	MAN	ISO/IEC 12207:2008	Process	7.2.2	Software Configuration Management			
Activity	PM.2	Project Plan Execution	MAN	ISO/IEC 12207:2008	Process	7.2.6	Software Review			
Activity	PM.2	Project Plan Execution	MAN	ISO/IEC 12207:2008	Process	7.2.8	Software Problem Resolution			
Activity	PM.3	Project Assessment and Control	MAN	ISO/IEC 12207:2008	Process	6.3.2	Project Assessment and Control			
Activity	PM.3	Project Assessment and Control	MAN	ISO/IEC 12207:2008	Process	6.3.7	Measurement			
Activity	PM.4	Project Closure	MAN	ISO/IEC 12207:2008	Process	6.1.2	Supply Process			

Table 21 — PM - Project Management tasks

Profile Process Identification and Composition						Process Base Document References										
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Profile Element3 Type	Profile Element3 ID	Profile Element3 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name	Source Element3 Type	Source Element3 ID	Source Element3 Name
Activity	***PM.1***	***Project Planning***														
"	"	"	Task	PM.1.3	Identify the specific tasks to be performed in order to produce the deliverables and their software components identified in the *Statement of Work*.	OPT	ISO/IEC 12207:2008	Process	6.3.1	Project Planning	Activity	6.3.1.3.2	Project Planning	Task	6.3.1..3.2.1	prepare the plans for execution of the project
"	"	"	Task	PM.1.4	Establish the *Estimated Duration* to perform each task.	OPT	ISO/IEC 12207:2008	Process	6.3.1	Project Planning	Activity	6.3.1.3.2	Project Planning	Task	6.3.1..3.2.1	prepare the plans for execution of the project
"	"	"	Task	PM.1.5	Identify and document the resources: human, material, equipment and tools, standards, including the required training of the Work Team to perform the project. Include in the schedule the dates when resources and training will be needed.	OPT	ISO/IEC 12207:2008	Process	6.3.1	Project Planning	Activity	6.3.1.3.2	Project Planning	Task	6.3.1..3.2.1	prepare the plans for execution of the project

Profile Process Identification and Composition							Process Base Document References										
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Profile Element3 Type	Profile Element3 ID	Profile Element3 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name	Source Element3 Type	Source Element3 ID	Source Element3 Name
"	"	"	Task	PM.1.6	Establish the *Composition of Work Team* assigning roles and responsibilities according to the *Resources*.	OPT	ISO/IEC 12207:2008	Process	6.3.1	Project Planning	Activity	6.3.1.3.2	Project Planning	Task	6.3.1..3.2.1	prepare the plans for execution of the project
"	"	"	Task	PM.1.7	Assign estimated start and completion dates to each one of the tasks in order to create the *Schedule of the Project Tasks* taking into account the assigned resources, sequence and dependency of the tasks.	OPT	ISO/IEC 12207:2008	Process	6.3.1	Project Planning	Activity	6.3.1.3.2	Project Planning	Task	6.3.1..3.2.1	prepare the plans for execution of the project
"	"	"	Task	PM.1.8	Calculate and document the project *Estimated Effort and Cost*	OPT	ISO/IEC 12207:2008	Process	6.3.1	Project Planning	Activity	6.3.1.3.2	Project Planning	Task	6.3.1..3.2.1	prepare the plans for execution of the project
Activity	***PM.2***	***Project Plan Execution***														

Profile Process Identification and Composition						Process Base Document References										
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Profile Element3 Type	Profile Element3 ID	Profile Element3 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name	Source Element3 Type	Source Element3 ID	Source Element3 Name
"	"	"	Task	PM.2.3	Conduct revision meetings with the Work Team, identify problems, review risk status, record agreements and track them to closure.	MAN	ISO/IEC 12207:2008	Process	7.2.6	Software Review	Activity	7.2.6.3.3	Technical Reviews.	Task	7.2.6.3.3.1	Technical reviews shall be held to evaluate the software products or services under consideration
"	"	"	Task	PM.2.3	Conduct revision meetings with the Work Team, identify problems, review risk status, record agreements and track them to closure.	MAN	ISO/IEC 12207:2008	Process	7.2.6	Software Review						
"	"	"	Task	PM.2.3	Conduct revision meetings with the Work Team, identify problems, review risk status, record agreements and track them to closure.	MAN	ISO/IEC 12207:2008	Process	7.2.8	Software Problem Resolution						
"	"	"	Task	PM.2.4	Conduct revision meetings with the Customer, record agreements and track them to closure.	MAN	ISO/IEC 12207:2008	Process	6.4.8	Software Acceptance Support						

Profile Process Identification and Composition						Process Base Document References										
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Profile Element3 Type	Profile Element3 ID	Profile Element3 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name	Source Element3 Type	Source Element3 ID	Source Element3 Name
''	''	''	Task	PM.2.4	Conduct revision meetings with the Customer, record agreements and track them to closure.	MAN	ISO/IEC 12207:2008	Process	7.2.2	Software Configuration Management						
Activity	PM.3	Project assessment and control	Task	PM.3.1	Evaluate project progress with respect to the *Project Plan*.	MAN	ISO/IEC 12207:2008	Process	6.3.7	Measurement						
Activity	PM.4	Project Closure	Task	PM.4.1	Formalize the completion of the project according to the *Delivery Instructions* established in the *Project Plan,* providing acceptance support and getting the *Acceptance Record* signed.	OPT	ISO/IEC 12207:2008	Process	6.1.2	Supply Process	Activity	6.1.2.3.6	Closure	Task	6.1.2.3.6.1	The supplier shall accept and acknowledge payment or other agreed consideration.

8.2.2 Process SI – Software Implementation

These columns and associated values are common to all rows in the following specification table, and therefore not repeated.

Table 22 — SI – Software Implementation process

Profile Document ID	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
29110-4-1	Process	SI	Software Implementation

Table 23 — SI – Software Implementation activities

Profile Process Identification and Composition			Process Base Document References							
Profile Element2 Type	Profile Element 2 ID	Profile Element2 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name
Activity	SI.1	Software Implementation Initiation	MAN	ISO/IEC 12207:2008	Process	6.3.1	Project Planning Process			
Activity	SI.2	Software Requirements Analysis	MAN	ISO/IEC 12207:2008	Process	6.4.1	Stakeholder Requirements Definition			
Activity	SI.2	Software Requirements Analysis	MAN	ISO/IEC 12207:2008	Process	7.1.2	Software Requirements Analysis			
Activity	SI.2	Software Requirements Analysis	MAN	ISO/IEC 12207:2008	Process	7.2.6	Software Review			
Activity	SI.3	Software Architectural and Detailed Design	MAN	ISO/IEC 12207:2008	Process	7.1.3	Software Architectural Design	Activity	7.1.3.3.1	Software Architectural Design
Activity	SI.3	Software Architectural and Detailed Design	MAN	ISO/IEC 12207:2008	Process	7.1.5	Software Construction Process	Activity	7.1.5.3.1	Software Construction
Activity	SI.3	Software Architectural and Detailed Design	MAN	ISO/IEC 12207:2008	Process	7.1.6	Software Integration Process	Activity	7.1.6.3.1	Software Integration
Activity	SI.3	Software Architectural and Detailed Design	MAN	ISO/IEC 12207:2008	Process	7.1.7	Software Qualification Testing Process	Activity	7.1.7.3.1	Software Qualification Testing
Activity	SI.4	Software Construction	MAN	ISO/IEC 12207:2008	Process	7.1.5	Software Construction Process	Activity	7.1.5.3.1	Software Construction
Activity	SI.5	Software Integration and Tests	MAN	ISO/IEC 12207:2008	Process	7.1.6	Software Integration	Activity	7.1.6.3.1	Software Integration
Activity	SI.5	Software Integration and Tests	MAN	ISO/IEC 12207:2008	Process	7.1.7	Software Qualification Testing			
Activity	SI.5	Software Integration and Tests	MAN	ISO/IEC 12207:2008	Process	7.2.4	Software Verification			
Activity	SI.5	Software Integration and Tests	MAN	ISO/IEC 12207:2008	Process	7.2.5	Software Validation			
Activity	SI.5	Software Integration and Tests	MAN	ISO/IEC 12207:2008	Process	7.1.6	Software Integration	Activity	7.1.6.3.1	Software Integration
Activity	SI.5	Software Integration and Tests	MAN	ISO/IEC 12207:2008	Process	7.1.5	Software Construction Process	Activity	7.1.5.3.1	Software Construction
Activity	SI.5	Software Integration and Tests	MAN	ISO/IEC 12207:2008	Process	7.2.1	Software Documentation Management			
Activity	SI.6	Product Delivery	MAN	ISO/IEC 12207:2008	Process	6.1.2	Supply Process	Activity	6.1.2.3.5	Product/Service Delivery and Support.

Table 24 — SI – Software Implementation tasks

Profile Process Identification and Composition						Process Base Document References										
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Profile Element3 Type	Profile Element3 ID	Profile Element3 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name	Source Element3 Type	Source Element3 ID	Source Element3 Name
Activity	***SI.1***	***Software Implementation Initiation***														
"	"	"	Task	SI.1.1	Revision of the current *Project Plan* with the Work Team members in order to achieve a common understanding and get their engagement with the project.	OPT	ISO/IEC 12207:2008	Process	6.3.1	Project Planning Process	Activity	6.3.1.3.3	Project Activation.	Task	6.3.1.3.3.3	The manager shall initiate the implementation of the project plan/s to satisfy the objectives and criteria set, exercising control over the project
Activity	***SI.2***	***Software Requirements Analysis***														
"	"	"	Task	SI.2.2	Document or update the Requirements Specification.	MAN	ISO/IEC 12207:2008	Process	6.4.1	Stakeholder Requirements Definition						
"	"	"	Task	SI.2.2	Document or update the Requirements Specification.	OPT	ISO/IEC 12207:2008	Process	7.1.2	Software Requirements Analysis	Activity	7.1.2.3.1	Software Requirements Analysis	Task	7.1.2.3.1.1	establish and document software requirements
"	"	"	Task	SI.2.3	Verify and obtain approval of the *Requirements Specification*	OPT	ISO/IEC 12207:2008	Process	7.1.2	Software Requirements Analysis	Activity	7.1.2.3.1	Software Requirements Analysis	Task	7.1.2.3.1.2	evaluate the software requirements
"	"	"	Task	SI.2.4	Validate and obtain approval of the *Requirements Specification*	OPT	ISO/IEC 12207:2008	Process	7.1.2	Software Requirements Analysis	Activity	7.1.2.3.1	Software Requirements Analysis	Task	7.1.2.3.1.3	The implementer shall conduct review(s) in accordance with subclause 7.2.6.

Profile Process Identification and Composition						Process Base Document References											
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Profile Element3 Type	Profile Element3 ID	Profile Element3 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name	Source Element3 Type	Source Element3 ID	Source Element3 Name
"	"	"	Task	SI.2.4	Validate and obtain approval of the *Requirements Specification*	OPT	ISO/IEC 12207:2008	Process	7.2.6	Software Review	Activity	7.2.6.3.3	Technical Reviews.	Task	7.2.6.3.3.1	Technical reviews shall be held to evaluate the software products or services under consideration
Activity	***SI.3***	***Software Architectural and Detailed Design***														
"	"	"	Task	SI.3.3	Document or update the *Software Design*	MAN	ISO/IEC 12207:2008	Process	7.1.3	Software Architectural Design	Activity	7.1.3.3.1	Software Architectural Design			
"	"	"	Task	SI.3.5	Establish or update *Test Cases and Test Procedures* for integration testing based on *Requirements Specification* and *Software Design.*	OPT	ISO/IEC 12207:2008	Process	7.1.5	Software Construction Process	Activity	7.1.5.3.1	Software Construction	Task	7.1.5.3.1.1.b	develop and document the following: b) Test procedures and data for testing each software unit and database
"	"	"	Task	SI.3.5	Establish or update *Test Cases and Test Procedures* for integration testing based on *Requirements Specification* and *Software Design.*	OPT	ISO/IEC 12207:2008	Process	7.1.6	Software Integration Process	Activity	7.1.6.3.1	Software Integration	Task	7.1.6.3.1.2	test as the aggregates are developed in accordance with the integration plan.

Profile Process Identification and Composition						Process Base Document References									
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Profile Element3 Type	Profile Element3 ID	Profile Element3 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name	Source Element3 Type	Source Element3 ID	Source Element3 Name
"	"	"	Task	SI.3.6	Verify and obtain approval of the *Test Cases and Test Procedures*	OPT	ISO/IEC 12207:2008	Process	7.1.6	Software Integration Process	Activity	7.1.6.3.1	Software Integration	Task	7.1.6.3.1.2	The integration and test results shall be documented.
"	"	"	Task	SI.3.6	Verify and obtain approval of the *Test Cases and Test Procedures*	OPT	ISO/IEC 12207:2008	Process	7.1.7	Software Qualification Testing Process	Activity	7.1.7.3.1	Software Qualification Testing	Task	7.1.7.3.1.1	It shall be ensured that the implementation of each software requirement is tested for compliance. The qualification testing results shall be documented.
Activity	***SI.4***	***Software Construction***														
"	"	"	Task	SI.4.3	Construct or update *Software Components* based on the detailed part of the *Software Design* and define or update unit test cases	OPT	ISO/IEC 12207:2008	Process	7.1.5	Software Construction Process	Activity	7.1.5.3.1	Software Construction	Task	7.1.5.3.1.1.a	develop and document the following: a) Each software unit and database.
"	"	"	Task	SI.4.4	Design or update unit test cases and apply them to verify that the *Software Components*	OPT	ISO/IEC 12207:2008	Process	7.1.5	Software Construction Process	Activity	7.1.5.3.1	Software Construction	Task	7.1.5.3.1.1.b	develop and document the following: b) Test procedures and data for testing each software unit and database

Profile Process Identification and Composition						Process Base Document References									
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Profile Element3 Type	Profile Element3 ID	Profile Element3 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name	Source Element3 Type	Source Element3 ID	Source Element3 Name
"	"	"	Task	SI.4.5	Correct the defects found until successful unit test (reaching exit criteria) is achieved	OPT	ISO/IEC 12207:2008	Process	7.1.5	Software Construction Process	Activity	7.1.5.3.1	Software Construction	Task	7.1.5.3.1.2	The implementer shall test each software unit and database ensuring that it satisfies its requirements. The test results shall be documented.
"	"	"	Task	SI.4.6	Update the *Traceability Record* incorporating *Software Components* constructed or modified	OPT	ISO/IEC 12207:2008	Process	7.1.5	Software Construction Process	Activity	7.1.5.3.1	Software Construction	Task	7.1.5.3.1.4	The implementer shall update the test requirements and the schedule for Software Integration.
Activity	***SI.5***	***Software Integration and Tests***														
"	"	"	Task	SI.5.3	Integrates the *Software* using *Software Components* and updates Test Cases and Test Procedures for integration testing, as needed	OPT	ISO/IEC 12207:2008	Process	7.1.6	Software Integration	Activity	7.1.6.3.1	Software Integration	Task	7.1.6.3.1.2	integrate the software units and software components and test as the aggregates are developed

Profile Process Identification and Composition						Process Base Document References											
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Profile Element3 Type	Profile Element3 ID	Profile Element3 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name	Source Element3 Type	Source Element3 ID	Source Element3 Name
"	"	"	Task	SI.5.4	Perform *Software* tests using *Test Cases and Test Procedures* for integration and document results in *Test Report*	OPT	ISO/IEC 12207:2008	Process	7.1.6	Software Integration	Activity	7.1.6.3.1	Software Integration	Task	7.1.6.3.1.2	integrate the software units and software components and test as the aggregates are developed
"	"	"	Task	SI.5.4	Perform *Software* tests using *Test Cases and Test Procedures* for integration and document results in *Test Report*	MAN	ISO/IEC 12207:2008	Process	7.1.7	Software Qualification Testing						
"	"	"	Task	SI.5.4	Perform *Software* tests using *Test Cases and Test Procedures* for integration and document results in *Test Report*	MAN	ISO/IEC 12207:2008	Process	7.2.4	Software Verification						
"	"	"	Task	SI.5.4	Perform *Software* tests using *Test Cases and Test Procedures* for integration and document results in *Test Report*	MAN	ISO/IEC 12207:2008	Process	7.2.5	Software Validation						

Profile Process Identification and Composition					Process Base Document References										
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Profile Element3 Type	Profile Element3 ID	Profile Element3 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name	Source Element3 Type	Source Element3 ID	Source Element3 Name
"	"	"	Task	SI.5.5	Correct the defects found and perform regression test until exit criteria is achieved	OPT	ISO/IEC 12207:2008	Process	7.1.6	Software Integration	Activity	7.1.6.3.1	Software Integration	Task	7.1.6.3.1.2	integrate the software units and software components and test as the aggregates are developed
"	"	"	Task	SI.5.6	Updates the *Traceability Record*. if appropriate.	OPT	ISO/IEC 12207:2008	Process	7.1.5	Software Construction Process	Activity	7.1.5.3.1	Software Construction	Task	7.1.5.3.1.4	The implementer shall update the test requirements and the schedule for Software Integration.
"	"	"	Task	SI.5.9	Document the *Software User Documentation* or update the current one, if appropriate	OPT	ISO/IEC 12207:2008	Process	7.1.6	Software Integration	Activity	7.1.6.3.1	Software Integration	Task	7.1.6.3.1.3	update the user documentation as necessary
"	"	"	Task	SI.5.9	Document the *Software User Documentation* or update the current one, if appropriate	MAN	ISO/IEC 12207:2008	Process	7.2.1	Software Documentation Management						
Activity	***SI.6***	***Product Delivery***														
"	"	"	Task	SI.6.6	Perform delivery according to *Delivery Instruction*.	OPT	ISO/IEC 12207:2008	Process	6.1.2	Supply Process	Activity	6.1.2.3.5	Product/Service Delivery and Support.	Task	6.1.2.3.5.1	The supplier shall deliver the software product or service as specified in the contract.

8.3 Process objectives references

8.3.1 Process PM – Project Management

These columns and associated values are common to all rows in the following specification table, and therefore not repeated.

Table 25 — PM – Process Management process

Profile Document ID	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
29110-4-1	Process	PM	Project Management

Table 26 — PM - Project Management process objectives references

Profile Process Objectives			Process Outcomes Base Document References							
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name
Objectives	PM.O1.	The *Project Plan* for the execution of the project is developed according to the *Statement of Work* and reviewed and accepted by the Customer. The tasks and resources necessary to complete the work are sized and estimated.	MAN	ISO/IEC 12207:2008	Process	6.3.1	Project Planning	Outcome	6.3.1.a	the scope of the work for the project is defined
Objectives	PM.O1.	The *Project Plan* for the execution of the project is developed according to the *Statement of Work* and reviewed and accepted by the Customer. The tasks and resources necessary to complete the work are sized and estimated.	MAN	ISO/IEC 12207:2008	Process	6.3.1	Project Planning	Outcome	6.3.1.c	the tasks and resources necessary to complete the work are sized and estimated
Objectives	PM.O1.	The *Project Plan* for the execution of the project is developed according to the *Statement of Work* and reviewed and accepted by the Customer. The tasks and resources necessary to complete the work are sized and estimated.	MAN	ISO/IEC 12207:2008	Process	6.3.1	Project Planning	Outcome	6.3.1.e	plans for the execution of the project are developed
Objectives	PM.O1.	The *Project Plan* for the execution of the project is developed according to the *Statement of Work* and reviewed and accepted by the Customer. The tasks and resources necessary to complete the work are sized and estimated.	MAN	ISO/IEC 12207:2008	Process	6.3.1	Project Planning	Outcome	6.3.1.f	plans for the execution of the project are activated

Profile Process Objectives				Process Outcomes Base Document References							
Profile Element2 Type	**Profile Element2 ID**	**Profile Element2 Name**	**Source Conf. Type**	**Source Doc. ID**	**Source Element1 Type**	**Source Element1 ID**	**Source Element1 Name**	**Source Element2 Type**	**Source Element2 ID**	**Source Element2 Name**
Objectives	PM.O1.	The *Project Plan* for the execution of the project is developed according to the *Statement of Work* and reviewed and accepted by the Customer. The tasks and resources necessary to complete the work are sized and estimated.	MAN	ISO/IEC 12207:2008	Process	6.3.7	Measurement	Outcome	6.3.7.a	the information needs of technical and management processes are identified;
Objectives	PM.O2.	Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status Record*. Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Customer acceptance documented in the *Acceptance Record*.	MAN	ISO/IEC 12207:2008	Process	6.3.2	Project Assessment and Control	Outcome	6.3.2.a	progress of the project is monitored and reported
Objectives	PM.O2.	Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status Record*. Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Customer acceptance documented in the *Acceptance Record*.	MAN	ISO/IEC 12207:2008	Process	6.3.2	Project Assessment and Control	Outcome	6.3.2.c	actions to correct deviations from the plan and to prevent recurrence of problems identified in the project, are taken when project targets are not achieved
Objectives	PM.O2.	Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status Record*. Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Customer acceptance documented in the *Acceptance Record*.	MAN	ISO/IEC 12207:2008	Process	6.3.2	Project Assessment and Control	Outcome	6.3.2.d	project objectives are achieved and recorded
Objectives	PM.O2.	Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status Record*. Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Customer acceptance documented in the *Acceptance Record*.	MAN	ISO/IEC 12207:2008	Process	6.3.7	Measurement	Outcome	6.3.7.d	the required data are collected, stored, analyzed, and the results interpreted;

Profile Process Objectives			Process Outcomes Base Document References							
Profile Element2 Type	**Profile Element2 ID**	**Profile Element2 Name**	**Source Conf. Type**	**Source Doc. ID**	**Source Element1 Type**	**Source Element1 ID**	**Source Element1 Name**	**Source Element2 Type**	**Source Element2 ID**	**Source Element2 Name**
Objectives	PM.O2.	Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status Record.* Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Customer acceptance documented in the *Acceptance Record*.	MAN	ISO/IEC 12207:2008	Process	6.3.7	Measurement	Outcome	6.3.7.e	information products are used to support decisions and provide an objective basis for communication;
Objectives	PM.O2.	Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status Record.* Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Customer acceptance documented in the *Acceptance Record*.	MAN	ISO/IEC 12207:2008	Process	6.4.8	Software Acceptance Support	Outcome	6.4.8.a	the product is completed and delivered to the acquirer;
Objectives	PM.O2.	Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status Record.* Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Customer acceptance documented in the *Acceptance Record*.	MAN	ISO/IEC 12207:2008	Process	7.2.8	Software Problem Resolution	Outcome	7.2.8.b	problems are recorded, identified and classified;
Objectives	PM.O2.	Progress of the project is monitored against the *Project Plan* and recorded in the *Progress Status Record.* Corrections to remediate problems and deviations from the plan are taken when project targets are not achieved. Closure of the project is performed to get the Customer acceptance documented in the *Acceptance Record*.	MAN	ISO/IEC 12207:2008	Process	7.2.8	Software Problem Resolution	Outcome	7.2.8.e	problems are tracked to closure.
Objectives	PM.O3.	The *Change Requests* are addressed through their reception and analysis. Changes to the software requirements are evaluated for cost, schedule and technical impact.	MAN	ISO/IEC 12207:2008	Process	7.1.2	Software Requirements Analysis	Outcome	7.1.2.g	changes to the software requirements are evaluated for cost, schedule and technical impact
Objectives	PM.O4.	Review meetings with the Work Team and the Customer are held. Agreements are registered and tracked.	MAN	ISO/IEC 12207:2008	Process	7.2.6	Software Review	Outcome	7.2.6.a	management and technical reviews are held based on the needs of the project
Objectives	PM.O4.	Review meetings with the Work Team and the Customer are held. Agreements are registered and tracked.	MAN	ISO/IEC 12207:2008	Process	7.2.6	Software Review	Outcome	7.2.6.c	review results are made known to all affected parties

Profile Process Objectives			Process Outcomes Base Document References							
Profile Element2 Type	**Profile Element2 ID**	**Profile Element2 Name**	**Source Conf. Type**	**Source Doc. ID**	**Source Element1 Type**	**Source Element1 ID**	**Source Element1 Name**	**Source Element2 Type**	**Source Element2 ID**	**Source Element2 Name**
Objectives	PM.O4.	Review meetings with the Work Team and the Customer are held. Agreements are registered and tracked.	MAN	ISO/IEC 12207:2008	Process	7.2.6	Software Review	Outcome	7.2.6.d	action items resulting from reviews are tracked to closure
Objectives	PM.O5.	Risks are identified as they develop and during the conduct of the project.	MAN	ISO/IEC 12207:2008	Process	6.3.4	Risk Management	Outcome	6.4.3.c	risks are identified as they develop and during the conduct of the project
Objectives	PM.O5.	Risks are identified as they develop and during the conduct of the project.	MAN	ISO/IEC 12207:2008	Process	7.2.6	Software Review	Outcome	7.2.6.e	risks and problems are identified and recorded
Objectives	PM.O6.	A software *Version Control Strategy* is developed. Items of *Software Configuration* are identified, defined and baselined. Modifications and releases of the items are controlled and made available to the Customer and Work Team. The storage, handling and delivery of the items are controlled.	MAN	ISO/IEC 12207:2008	Process	7.2.2	Software Configuration Management	Outcome	7.2.2.a	a software configuration management strategy is developed
Objectives	PM.O6.	A software *Version Control Strategy* is developed. Items of *Software Configuration* are identified, defined and baselined. Modifications and releases of the items are controlled and made available to the Customer and Work Team. The storage, handling and delivery of the items are controlled.	MAN	ISO/IEC 12207:2008	Process	7.2.2	Software Configuration Management	Outcome	7.2.2.b	items generated by the process or project are identified, defined and baselined
Objectives	PM.O6.	A software *Version Control Strategy* is developed. Items of *Software Configuration* are identified, defined and baselined. Modifications and releases of the items are controlled and made available to the Customer and Work Team. The storage, handling and delivery of the items are controlled.	MAN	ISO/IEC 12207:2008	Process	7.2.2	Software Configuration Management	Outcome	7.2.2.c	modifications and releases of the items are controlled
Objectives	PM.O6.	A software *Version Control Strategy* is developed. Items of *Software Configuration* are identified, defined and baselined. Modifications and releases of the items are controlled and made available to the Customer and Work Team. The storage, handling and delivery of the items are controlled.	MAN	ISO/IEC 12207:2008	Process	7.2.2	Software Configuration Management	Outcome	7.2.2.d	modifications and releases are made available to affected parties

Profile Process Objectives			Process Outcomes Base Document References							
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name
Objectives	PM.O6.	A software *Version Control Strategy* is developed. Items of *Software Configuration* are identified, defined and baselined. Modifications and releases of the items are controlled and made available to the Customer and Work Team. The storage, handling and delivery of the items are controlled.	MAN	ISO/IEC 12207:2008	Process	7.2.2	Software Configuration Management	Outcome	7.2.2.g	the storage, handling and delivery of the items are controlled
Objectives	PM.O7.	Software Quality Assurance is performed to provide assurance that work products and processes comply with the *Project Plan* and *Requirements Specification*.	MAN	ISO/IEC 12207:2008	Process	7.2.3	Software Quality Assurance	Outcome	7.2.3.a	a strategy for conducting quality assurance is developed
Objectives	PM.O7.	Software Quality Assurance is performed to provide assurance that work products and processes comply with the *Project Plan* and *Requirements Specification*.	MAN	ISO/IEC 12207:2008	Process	7.2.3	Software Quality Assurance	Outcome	7.2.3.b	evidence of Software quality assurance is produced and maintained
Objectives	PM.O7.	Software Quality Assurance is performed to provide assurance that work products and processes comply with the *Project Plan* and *Requirements Specification*.	MAN	ISO/IEC 12207:2008	Process	7.2.3	Software Quality Assurance	Outcome	7.2.3.c	problems and/or non-conformance with requirements are identified and recorded
Objectives	PM.O7.	Software Quality Assurance is performed to provide assurance that work products and processes comply with the *Project Plan* and *Requirements Specification*.	MAN	ISO/IEC 12207:2008	Process	7.2.3	Software Quality Assurance	Outcome	7.2.3.d	adherence of products, processes and activities to the applicable standards, procedures and requirements are verified

8.3.2 Process SI – Software Implementation

These columns and associated values are common to all rows in the following specification table, and therefore not repeated.

Table 27 — SI – Software Implementation process

Profile Document ID	Profile Element1 Type	Profile Element1 ID	Profile Element1 Name
29110-4-1	Process	SI	Software Implementation

Table 28 — SI – Software Implementation process objectives references

Profile Process Objectives			Process Outcomes Base Document References							
Profile Element2 Type	Profile Element2 ID	Profile Element2 Name	Source Conf. Type	Source Doc. ID	Source Element1 Type	Source Element1 ID	Source Element1 Name	Source Element2 Type	Source Element2 ID	Source Element2 Name
Objectives	SI.O1.	Tasks of the activities are performed through the accomplishment of the current *Project Plan*.								
Objectives	SI.O2.	Software requirements are defined, analyzed for correctness and testability, approved by the Customer, baselined and communicated.	MAN	ISO/IEC 12207:2008	Process	6.4.1	Stakeholder Requirements Definition	Outcome	6.4.1.a	the required characteristics and context of use of services are specified.
Objectives	SI.O2.	Software requirements are defined, analyzed for correctness and testability, approved by the Customer, baselined and communicated.	MAN	ISO/IEC 12207:2008	Process	7.1.2	Software Requirements Analysis	Outcome	7.1.2.a	the requirements allocated to the software elements of the system and their interfaces are defined
Objectives	SI.O2.	Software requirements are defined, analyzed for correctness and testability, approved by the Customer, baselined and communicated.	MAN	ISO/IEC 12207:2008	Process	7.1.2	Software Requirements Analysis	Outcome	7.1.2.b	software requirements are analyzed for correctness and testability
Objectives	SI.O2.	Software requirements are defined, analyzed for correctness and testability, approved by the Customer, baselined and communicated.	MAN	ISO/IEC 12207:2008	Process	7.1.2	Software Requirements Analysis	Outcome	7.1.2.f	the software requirements are approved and updated as needed