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Systems and software engineering — Lifecycle profiles for Very Small Enterprises (VSEs) —

Part 3-3: Certification requirements for conformity assessments of VSE profiles using process assessment and maturity models

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

Partie 3-3: Exigences de cetification pour la vérification de conformité en utilisant la vérification des processus et les niveaux de maturité

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

A list of all parts in the ISO/IEC 29110 series can be found on the ISO website.

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Introduction

Very Small Entities (VSEs) around the world are creating valuable products and services. For the purpose of ISO/IEC 29110, a Very Small Entity (VSE) is an enterprise, an organization, a department or a project having up to 25 people. Since many VSEs develop and/or maintain system and software components used in systems, either as independent products or incorporated in larger systems, a recognition of VSEs as suppliers of high quality products is required.

According to the Organization for Economic Co-operation and Development (OECD) SME and Entrepreneurship Outlook report (2005), "Small and Medium Enterprises (SMEs) constitute the dominant form of business organization in all countries world-wide, accounting for over 95 % and up to 99 % of the business population depending on country". The challenge facing governments and economies 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. Implementation of and conformance with these standards is difficult, if not impossible. Consequently VSEs have no, or very limited, ways to be recognized as entities that produce quality systems/system elements including software in their domain. Therefore, VSEs are excluded from some economic activities.

It has been found that VSEs find it difficult to relate International Standards to their business needs and to justify the effort required to apply standards to their business practices. Most VSEs can neither afford the resources, in terms of number of employees, expertise, budget and time, nor do they see a net benefit in establishing over-complex systems or software life cycle processes. To address some of these difficulties, a set of guides has been developed based on a set of VSE characteristics. The guides are based on subsets of appropriate standards processes, activities, tasks, and outcomes, referred to as Profiles. The purpose of a profile is to define a subset of International Standards relevant to the VSEs' context; for example, processes, activities, tasks, and outcomes of ISO/IEC/IEEE 12207 for software; and processes, activities, tasks, and outcomes of ISO/IEC/IEEE 15288 for systems; and information products (documentation) of ISO/IEC/IEEE 15289 for software and systems.

VSEs can achieve recognition through implementing a profile and by being audited against ISO/IEC 29110 specifications.

The ISO/IEC 29110- series of International Standards and Technical Reports can be applied at any phase of system or software development within a life cycle. This series of International Standards and Technical Reports is intended to be used by VSEs that do not have experience or expertise in adapting/tailoring ISO/IEC/IEEE 12207 or ISO/IEC/IEEE 15288 standards to the needs of a specific project. VSEs that have expertise in adapting/tailoring ISO/IEC/IEEE 12207 or ISO/IEC/IEEE 15288 are encouraged to use those standards instead of ISO/IEC 29110.

ISO/IEC 29110 is intended to be used with any lifecycle such as waterfall, iterative, incremental, evolutionary or agile. Systems, in the context of ISO/IEC 29110, are typically composed of hardware and software components.

The ISO/IEC 29110- series, targeted by audience, has been developed to improve system or software and/or service quality, and process performance. See Table 1.

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Table 1 — ISO/IEC 29110 target audience

ISO/IEC 29110	Title	Target audience
Part 1	Overview	VSEs and their customers, assessors, standards producers, tool vendors and methodology vendors.
Part 2	Framework for profile preparation	Profile producers, tool vendors and methodology vendors. Not intended for VSEs.
Part 3	Certification and assessment guidance	VSEs and their customers, assessors, accreditation bodies.
Part 4	Profile specifications	VSEs, customers, standards producers, tool vendors and methodology vendors.
Part 5	Management, engineering and service delivery guides	VSEs and their customers.
Part 6	Management and engineering guides not tied to a specific profile	VSEs and their customers.

If a new profile is needed, ISO/IEC 29110-4 and ISO/IEC/TR 29110-5 can be developed with minimal impact to existing documents.

ISO/IEC/TR 29110-1 defines the terms common to the Set of ISO/IEC 29110 Documents. It introduces processes, life cycle and standardization concepts, the taxonomy (catalogue) of ISO/IEC 29110 profiles, and the ISO/IEC 29110- series. It also introduces the characteristics and needs of a VSE, and clarifies the rationale for specific profiles, documents, standards and guides.

ISO/IEC 29110-2-1 introduces the concepts for systems and software engineering profiles for VSEs. It establishes the logic behind the definition and application of profiles. For standardized profiles, it specifies the elements common to all profiles (structure, requirements, conformance, assessment). For domain-specific profiles (profiles that are not standardized and developed outside of the ISO process), it provides general guidance adapted from the definition of standardized profiles.

ISO/IEC 29110-3 defines certification schemes, assessment guidelines and compliance requirements for process capability assessment, conformity assessments, and self-assessments for process improvements. ISO/IEC 29110-3 also contains information that can be useful to developers of certification and assessment methods and developers of certification and assessment tools. ISO/IEC 29110-3 is addressed to people who have direct involvement with the assessment process, e.g. the auditor, certification and accreditation bodies and the sponsor of the audit, who need guidance on ensuring that the requirements for performing an audit have been met.

ISO/IEC 29110-4-m provides the specification for all profiles in one profile group that are based on subsets of appropriate standards elements.

ISO/IEC/TR 29110-5-m-n provides a management and engineering guide for each profile in one profile group.

ISO/IEC/TR 29110-6-x provides management and engineering guides not tied to a specific profile.

This part of ISO/IEC 29110 presents conformity assessment requirements using process assessments and maturity models. This part of ISO/IEC 29110 is addressed to people who have direct involvement with the assessment process, e.g. assessor, certification and accreditation bodies and sponsor of an assessment.

Figure 1 describes the ISO/IEC 29110 International Standards (IS) and Technical Reports (TR) and positions the parts within the framework of reference. Overview, assessment guide, management and engineering guide are available from ISO as freely available Technical Reports (TR). The Framework document, profile specifications and certification schemes are published as International Standards (IS).

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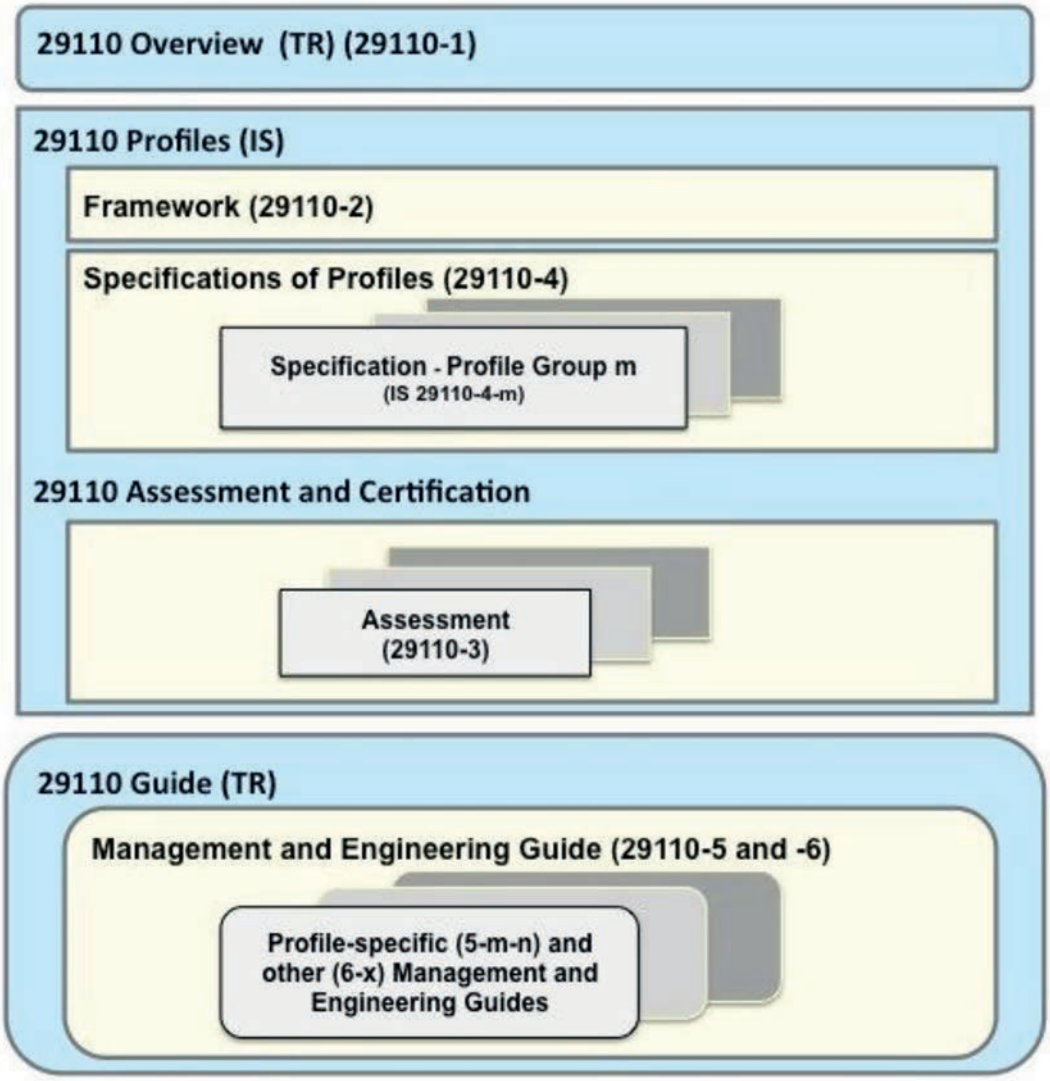


Figure 1 — ISO/IEC 29110 Series

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Systems and software engineering — Lifecycle profiles for Very Small Enterprises (VSEs) —

Part 3-3: Certification requirements for conformity assessments of VSE profiles using process assessment and maturity models

1 Scope

This document contains the requirements for certification bodies performing conformity assessments, of the requirements contained in VSE profile specifications (e.g. ISO/IEC 29110-4-1 for VSE software basic profile), using process assessments and maturity models. This document is based on published ISO/IEC standards and guides for

a) certification bodies (see ISO/IEC 17065)

b) the process assessment and organizational process maturity performed according to the requirements of the ISO/IEC 33001 to ISO/IEC 33099 family of process assessment standards, and

c) based on ISO/IEC 29169 to support an environment which encourages worldwide recognition of VSE profiles conformity assessment results.

The overall framework for conformity assessment follows the approach defined in ISO/IEC 17065:2012.

This document has been developed following practical use and in consultation with key stakeholders, national accreditation bodies, and ISO's policy committee for conformity assessment (CASCO).

This document is addressed to people and certification bodies who have a direct relationship with the assessment process based on the VSE profiles.

It is intended that ISO/IEC/TR 29110-1, ISO/IEC 29110-2-1 and ISO/IEC 29110-4-1 (containing VSE profile specifications) be read first when investigating the possibility of conducting VSE profile certification.

NOTE Any clause with requirements directly copied from other standards has those copied requirements marked up in a box. Other requirements which are also copied but for which information is added are not marked up in a box but their source is clearly referenced in the text.

2 Normative references

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

ISO/IEC 17065:2012, *Conformity assessment — Requirements for bodies certifying products, processes and services*

ISO/IEC/TR 29110-3-1, *Systems and software engineering — Lifecycle profiles for Very Small Entities (VSEs) — Part 3-1: Assessment guide*

ISO/IEC 29110-4-1, *Software engineering — Lifecycle profiles for Very Small Entities (VSEs) — Part 4-1: Software engineering - Profile specifications: Generic profile group*

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ISO/IEC 29169, *Information technology — Process assessment — Application of conformity assessment methodology to the assessment to process quality characteristics and organizational maturity*

ISO/IEC 33002:2015, *Information technology — Process assessment — Requirements for performing process assessment*

ISO/IEC 33003, *Information technology — Process assessment — Requirements for process measurement frameworks*

ISO/IEC 33004, *Information technology — Process assessment — Requirements for process reference, process assessment and maturity models*

ISO/IEC 33020, *Information technology — Process assessment — Process measurement framework for assessment of process capability*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC/TR 29110-1, ISO/IEC 17000 and ISO/IEC 17065 and the following apply.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
basic process set
set of processes that ensure the achievement of the basic maturity level

Note 1 to entry: The set of processes are drawn from specified process assessment models.

Note 2 to entry: A basic process set will include a minimum set of processes, together with additional and optional processes determined by the organizational context for the assessment.

3.2
certification body
third-party conformity assessment body operating certification schemes

Note 1 to entry: A certification body can be non-governmental or governmental (with or without regulatory authority).

Note 2 to entry: For this document, the certification body will be also named the assessment body of Type A independence (i.e. third party), as defined in ISO/IEC 33002 for process assessments.

[SOURCE: ISO/IEC 17065:2012, 3.12, modified – Note 2 has been added.]

3.3
certification scheme
certification system related to specified products, to which the same specified requirements, specific rules and procedures apply

Note 1 to entry: Adapted from ISO/IEC 17000:2004, 2.8.

Note 2 to entry: A “certification system” is a “conformity assessment system”, which is defined in ISO/IEC 17000:2004, 2.7.

[SOURCE: ISO/IEC 17065:2012, 3.9, modified – Notes 3 and 4 have been deleted.]

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3.4
conformity assessment
demonstration that specified requirements relating to a product, process, system, person or body are fulfilled

[SOURCE: ISO/IEC 17000:2004, 2.1]

3.5
conformity assessment body
body that performs conformity assessment services

[SOURCE: ISO/IEC 17000:2004, 2.5]

Note 1 to entry: Where the term conformity assessment is used, the definition in ISO/IEC 17000 applies. Wherever the term assessment is used without the word conformity (e.g. assessment, process assessment, conformant process assessment, assessment body), the relevant ISO/IEC 33001 definitions apply.

Note 2 to entry: Conformity assessment body is synonymous with assessment body or the body performing assessment in ISO/IEC 33002.

Note 3 to entry: In this document it will only refer to third-party conformity assessment body operating conformity assessment services.

3.6
conformity assessment scheme
conformity assessment system as related to specified objects of conformity assessment to which the same particular specified requirements, rules and procedures apply

[SOURCE: ISO/IEC 17000:2004, 2.8]

3.7
extended process set
set of processes specific to a maturity level higher than the basic maturity level that ensures the achievement of the relevant process profile

Note 1 to entry: The set of processes are drawn from specified process assessment models.

Note 2 to entry: An extended process set will include a minimum set of processes, together with additional and optional processes determined by the organizational context for the assessment.

3.8
maturity model
model, derived from one or more specified process assessment model(s), that identifies the process sets associated with the levels in a specified scale of organizational process maturity

[SOURCE: ISO/IEC 33001:2015, 3.3.7]

Note 1 to entry: The maturity model for the VSE profiles is defined in ISO/IEC/TR 29110-3-1:2015, Annex A.

3.9
organizational (process) maturity
extent to which an organizational unit consistently implements processes within a defined scope that contributes to the achievement of its business needs (current or projected)

Note 1 to entry: The defined scope is that of the specified maturity model.

Note 2 to entry: In this document, and as defined in ISO/IEC/TR 29110-3-1, organizational (process) maturity corresponds to fulfilment of VSE profiles.

[SOURCE: ISO/IEC 33001:2015, 3.4.2, modified – Note 2 has been added.]

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