Consolidated product

Software Process Assessment – Part 6 : Qualification and training of assessors

Version 1.00

(Formerly ATQG Version 1.00)

PREAMBLE

In January 1993 a program of work was approved by ISO/IEC JTC1 for the development of an international standard for software process assessment. In June 1993 the SPICE Project Organisation was established with a mandate from JTC1/SC7 to:

- assist the standardisation project in its preparatory stage by developing initial working drafts;
- undertake user trials in order to gain early experience data which will form the basis for revision of the Technical Report prior to publication as a full International Standard;
- create market awareness and take-up of the evolving standard.

The SPICE Project Organisation completed its task of producing the set of working drafts in June 1995. The SPICE user trials commenced in January 1995. The working drafts have now been handed over to JTC1/SC7 for the normal process of standards development, commencing in July 1995.

So far as can be determined, intellectual property rights for these documents reside with the individuals and organisations that contributed to their development. In agreeing to take part in the Project, participants agreed to abide by decisions of the Management Board in relation to the conduct of the Project. It is in accordance with this understanding that the Management Board has now agreed to release the baseline set of documents. This introductory statement sets out the terms and conditions under which this release is permitted.

The documents as released are available freely from the SPICE Project File Server, sisyphus.cit.gu.edu.au, by anonymous ftp, or from approved mirrors of the server. A hypertext version of the documents is also available on the World Wide Web at URL http://www-sqi.cit.gu.edu.au/spice/

TERMS AND CONDITIONS

These terms and conditions apply to the set of documents developed by the SPICE Project, and published within the Project as Version 1.0, with the following titles:

– Part 1 : *Concepts and introductory guide*
– Part 2 : *A model for process management*
– Part 3 : *Rating processes*
– Part 4 : *Guide to conducting assessment*
– Part 5 : *Construction, selection and use of assessment instruments and tools*
– Part 6 : *Qualification and training of assessors*
– Part 7 : *Guide for use in process improvement*
– Part 8 : *Guide for use in determining supplier process capability*
– Part 9 : *Vocabulary*

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Acknowledgment:

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Note on document formatting

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Paper size	**A4**	**US letter (imperial)**
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SOFTWARE PROCESS ASSESSMENT Part 6

Qualification and training of assessors

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Foreword

In June 1991, the fourth plenary meeting of ISO/IEC JTC1/SC7 approved a study period (resolution 144) to investigate the needs and requirements for a standard for software process assessment.

The results, which are documented in a Study Report (JTC1/SC7 N944R, 11 June 1992), came to the following major conclusions:

- there is international consensus on the needs and requirements for a standard for process assessment;
- there is international consensus on the need for a rapid route to development and trialling to provide usable output in an acceptable timescale and to ensure the standard fully meets the needs of its users;
- there is international commitment to resource the project with an international project team staffed by full time resource, with development being coordinated through four technical development centres in Europe, N America (2) and Asia Pacific;
- the standard should initially be published as a Technical Report Type 2 to enable the developing standard to stabilise during the period of the user trials, prior to its issuing as a full International Standard.

The new work item was approved in January 1993 by JTC1. In June 1993 the SPICE Project Organisation was established with a mandate from JTC1/SC7 to:

- assist the standardisation project in its preparatory stage to develop initial working drafts;
- undertake user trials in order to gain early experience data which will form the basis for revision of the published Technical Report prior to review as a full International Standard;
- create market awareness and take-up of the evolving standard.

The SPICE Project Organisation completed its task of producing the set of working drafts in June 1995. These working drafts have formed the basis for this Technical Report Type 2. The period of SPICE user trials commenced in January 1995 and is synchronised in phases to allow feedback to the stages of the technical work.

ISO/IEC Directives state that a Technical Report Type 2 may be used to publish a prospective standard for provisional application so that information and experience of its practical use may be gathered.

This Technical Report Type 2 consists of the following parts, under the general title *Software Process Assessment:*

- Part 1 : *Concepts and introductory guide*
- Part 2 : *A model for process management*
- Part 3 : *Rating processes*
- Part 4 : *Guide to conducting assessment*
- Part 5 : *Construction, selection and use of assessment instruments and tools*
- Part 6 : *Qualification and training of assessors*
- Part 7 : *Guide for use in process improvement*
- Part 8 : *Guide for use in determining supplier process capability*
- Part 9 : *Vocabulary*

This part of the standard (Part 6) is for guidance only.

Introduction

Conducting a software process assessment in accordance with the provisions of this International Standard assumes that the assessment team includes at least one qualified assessor. The qualified assessor has the primary responsibility for ensuring that the requirements are met during the assessment.

As described in parts 3 and 4 of this International Standard, rating the assessed practices and processes ultimately depends on the skilled judgement of the assessors. The various elements of the standard provide the framework within which assessors exercise judgement, working together to remove, or at least reduce to a minimum, any subjective elements. Nevertheless, the achievement of an acceptable level of consistency, repeatability and reliability of results relies on competent assessors with appropriate skills, experience, and knowledge of the software process, of the model for processes described in part 2 of this International Standard, and of the conduct of assessment and rating described in parts 3 and 4 of this International Standard.

The qualified assessor in a team has the pivotal role of ensuring that other team members collectively have the right blend of specialized knowledge and assessment skills. The qualified assessor provides the necessary guidance to the team, and helps to moderate the judgements and ratings made by the other members of the team to ensure consistency of interpretation.

This part of the International Standard is concerned with assessor competencies and appropriate education, training and experience including mechanisms that may be used to demonstrate competence and to validate education, training and experience.

This guide is primarily directed to assessors, to those responsible for the selection and development of assessors, and to sponsors of assessments seeking assurance that an assessor is appropriately qualified for the task. In addition, it is useful to organizations wishing to offer appropriate assessment training, or in the future, to organizations or bodies wishing to institute registration schemes for suitably qualified assessors.

1 Scope

This part of the International Standard defines the initial and ongoing qualification of assessors and provides guidance for the preparation and qualification of assessors to perform software process assessments. It describes mechanisms that may be used to demonstrate assessor competence and to validate an assessor's education, training and experience.

The guidance in this document is applicable to an organizational unit or a sponsor of an assessment wishing to select or specify the type of assessors to perform either self-assessments or independent assessments.

The guidance is also applicable to the identification and demonstration of the competencies necessary for the performance of assessments, and to the process of obtaining those competencies.

Guidance on the competence and qualification of those who perform process capability determination or process improvement activities is outside the scope of this guide.

2 Normative references

There are no normative references in this part of the International Standard.

3 Definitions

For the purposes of this part of this International Standard, the definitions in *Software Process Assessment - Part 9 : Vocabulary* apply.

4 An overview of the assessor and qualification

4.1 The role of the assessor

The role of the assessor, as described in part 4 of this International Standard, is to assess the capability of the software process of an organizational unit in a constructive and objective manner. The assessment should be focused on the process and not the people implementing the process. The role varies depending on the assessment approach as shown in table 1 below.

Table 1 - The role of the assessor in different assessment approaches

Self-assessment approach	Independent assessment approach
Is task and people oriented.	Is task oriented.
Guides the assessment.	Controls the assessment.
Delivers an approach.	Delivers a rating.
Promotes discussion.	Regulates discussion.
Works with projects.	Works separately from projects.
Uses organizational unit's business goals.	May be indifferent to organizational unit's business goals.
Influences through results obtained, relationships established and expertise.	Influences through position and expertise.
Seeks compliance and commitment.	Determines process adequacies.
Is like being a change agent.	Is like being an auditor.

4.2 Philosophy

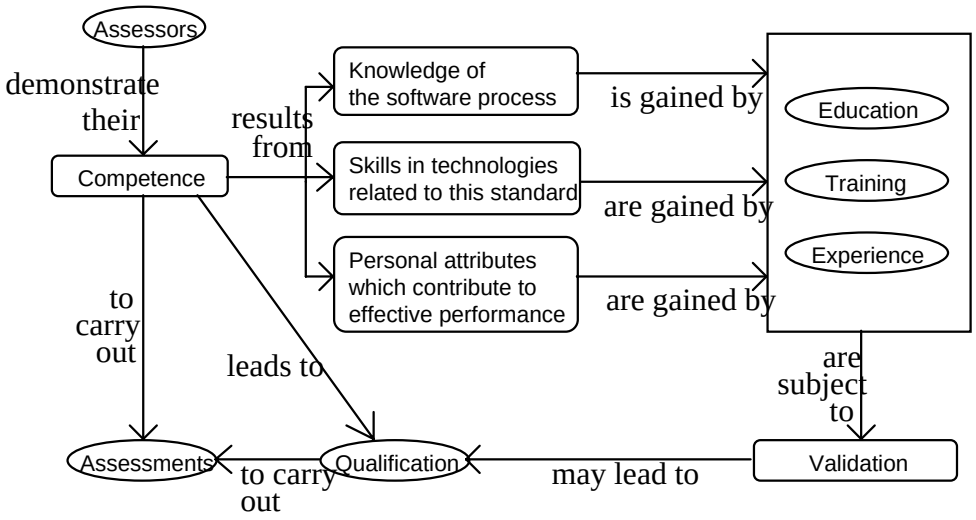

Figure 1 - Entity relationships

Figure 1 shows the key entities and their relationships which may be articulated as follows:

- assessors demonstrate their competence to carry out assessments;
- it is this competence which leads to assessor qualification;
- competence results from
  - the knowledge of the software process;
  - skills in the principle technologies of this International Standard including assessment, rating, assessment instruments, and the process model;
  - personal attributes which contribute to effective performance;
- the knowledge, skills and personal attributes are gained by a combination of education, training and experience;
- an alternative to demonstrable competence is to validate an intending assessor's education, training and experience.

4.3 The process of qualification and on-going qualification

4.3.1 General

Qualified assessors obtain their qualification as shown in figure 2. In addition, the qualification to carry out assessments should be maintained (renewed). The process of qualification and the maintenance of qualification is described in 4.3.2 to 4.3.4 below.

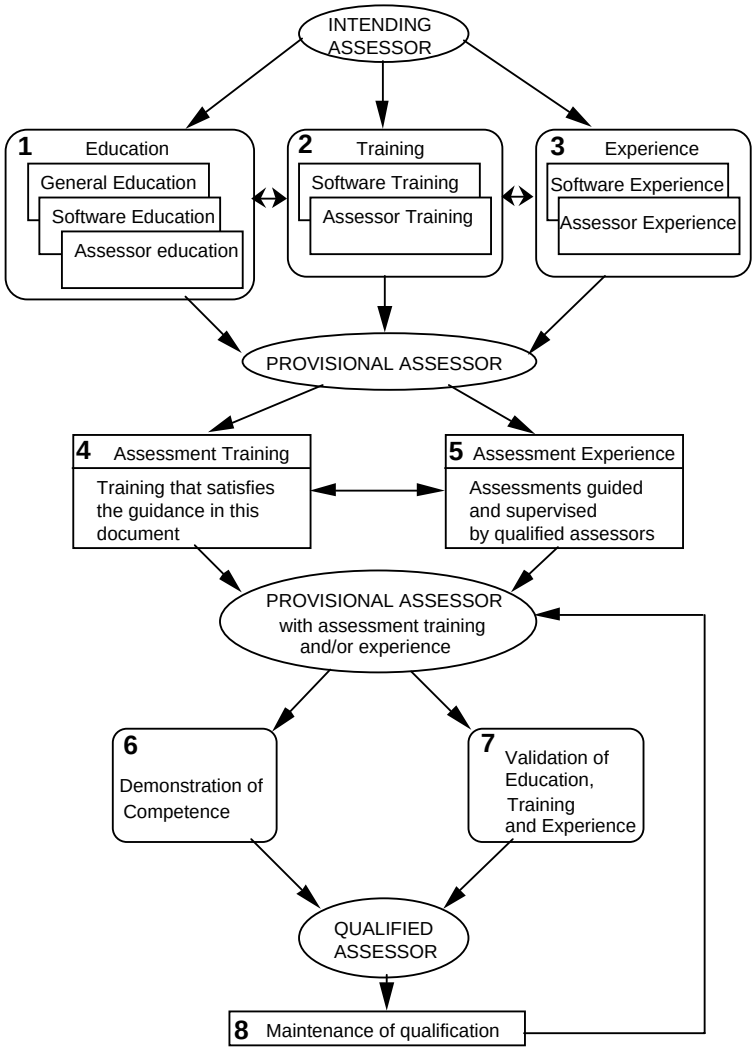

Figure 2 - Path to become a qualified assessor

4.3.2 Becoming a provisional assessor

A provisional assessor is a person who is competent to carry out assessments under the guidance and supervision of a qualified assessor; i.e., an assessor who has reached the required levels of education, training and experience but who has not yet completed the relevant training and/or participated in a sufficient number of assessments conducted according to the provisions of this International Standard.

A provisional assessor, therefore, should be competent to carry out software audits or assessments. A provisional assessor should be trained and experienced in the software process as well as in software process assessment or software quality assessment. In addition, a provisional assessor should have an acceptable level of formal education. Formal education is a combination of general education, software education, and assessor education.

Acceptable levels of education may comprise

- formal courses offered by a college or university;
- professional courses organized by recognized local or international bodies;
- vendor sponsored courses;
- employer sponsored courses.

Acceptable levels of training may comprise

- training provided by recognized local or international bodies;
- training provided by vendors and trainers using the guidance in this part of the International Standard.

Acceptable levels of experience may comprise

- direct "hands-on" experience in specialist areas such as software engineering, software development/maintenance, software quality, or quality assurance;
- management overseeing software specialist areas such as software engineering, software development/maintenance, software quality or quality assurance.

4.3.3 Becoming a qualified assessor

To become a qualified assessor, an assessor should already be a competent software development/maintenance professional or a software audit/assessment professional as described above. In addition, the assessor should have completed training based on the guidance in this part of the International Standard and should have participated in assessments conducted according to the provisions of this International Standard.

4.3.4 Maintenance of the qualification

To maintain (renew) the qualification, assessors should update their knowledge and skills by engaging in a number of professional activities as well as carrying out further assessments conducted according to the provisions of this International Standard.

5 Assessor competence

5.1 The software process

An assessor should be familiar with software development and maintenance including various life cycle models (see figure 2, item 6) and be able to demonstrate competence in at least one of the process categories of the process model described in part 2 of this International Standard.

An assessor should also be able to demonstrate familiarity with the software process, and should be experienced with the use of one or more development models such as Waterfall or Rapid Prototyping.

In addition, an assessor should show an understanding of the activities required to support the software process, including when and how they should be applied according to the development model chosen within the application domain in which the assessor is experienced.

An assessor should be familiar with a range of relevant software engineering standards.

5.2 Assessment technology

Assessors should demonstrate competence in all aspects of the technology of assessment pertaining to this International Standard, particularly the core aspects included in parts 2 to 5 as shown in figure 3.

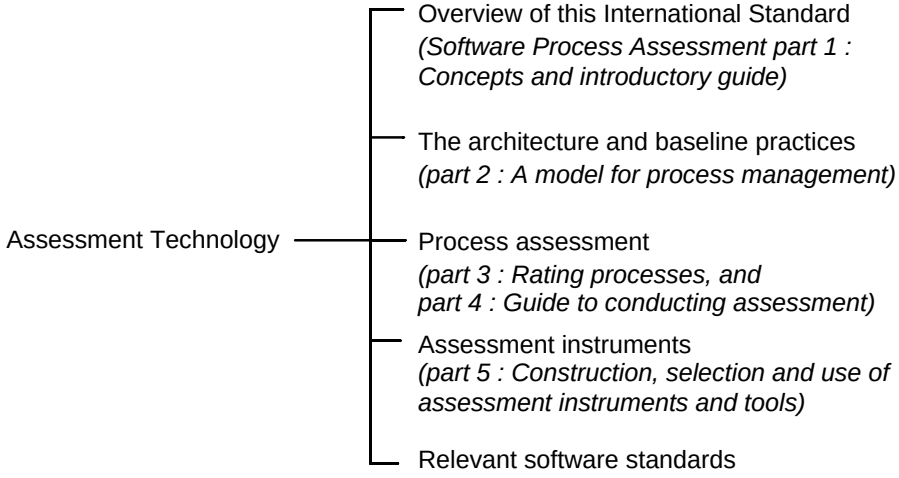

Figure 3 - Demonstrable elements of assessment technology

5.3 Personal attributes

5.3.1. General

Assessors should possess the personal attributes shown in figure 4 and described below.

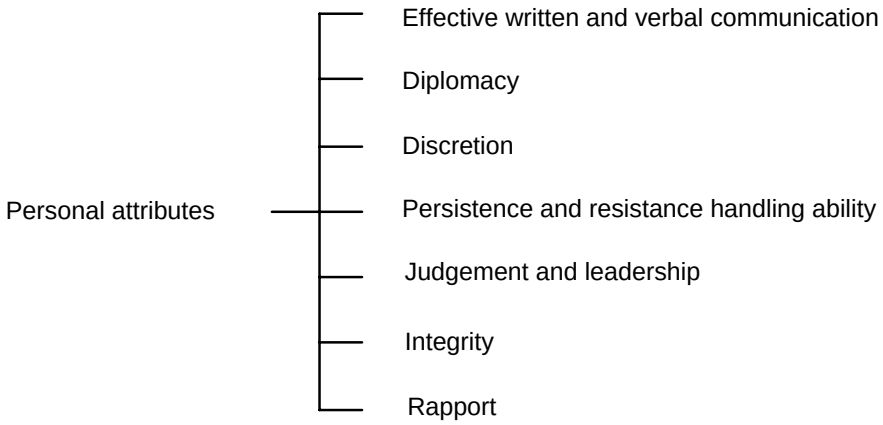

Figure 4 - Personal attributes

5.3.2. Effective written and verbal communication

Assessors who perform assessments will interact with members of the organizational unit being assessed. They may be feeding back the results of the assessment in the form of written reports and/or presentations. Assessors should be able to communicate the findings of the assessments in a clear, non-judgmental style. Assessment findings should be documented in clear and unambiguous language.

5.3.3. Diplomacy

Assessors should act with professionalism and decorum at all times. Independent assessors are guests of the organizational unit being assessed and their conduct should be above reproach at all times.

5.3.4. Discretion

Assessors should develop and maintain the confidence of the assessment participants. In particular, assessors should preserve the confidentiality of the results of the assessment and of information received during an assessment in accordance with the terms of any confidentiality agreement included in the assessment constraints (see parts 3 and 4 of this International Standard).

5.3.5. Persistence and resistance handling ability

Assessors should be persistent in carrying out the duties that are expected of them. They should be able to resolve any conflicts and handle any resistance that they may experience from assessment participants.

5.3.6. Judgement and leadership

It is critical that the organizational unit being assessed has confidence in, and respect for, the assessment team leader, team co-ordinator and team members. If they are not respected within the organizational unit, then the assessment findings may not be accepted by the organizational unit.

5.3.7. Integrity

The assessment team leader, team co-ordinator and team members should have no conflict of interest in performing the assessment. For example, the assessment team members, the leader and the co-ordinator should not be individuals whose performance is being measured by the improvements enacted within the organizational unit. If the team members' individual performances are being measured by the outcome of the assessment, they cannot be considered objective.

5.3.8. Rapport

Individuals who because of their organizational position or personality will stifle the open and honest flow of information should not participate in the assessment. For example, managers who evaluate the performance of individuals involved in the projects being assessed should not be assessment team members. Project personnel might be reluctant to disclose problem areas to their own management as their individual performance may be affected.

6 Validation of education, training and experience

6.1 Overview

Validation of an assessor's education, training and experience (figure 2, item 7) is an alternative to the demonstration of competence as a means of qualification. The education, training and experience may be validated by a review of these elements. The right balance is of prime importance. In general terms, the balance includes general education, software education and assessor education together with training and experience in both software development activities and assessments.

The following factors should be considered when reviewing the education, training and experience of an assessor.

Duration: The amount of time the assessor has spent in a particular process category. (See part 2 of this International Standard for process categories).

Range: The assessor's breadth of exposure to the process categories.

Depth: The level of specialization.

Responsibility: The extent to which an assessor has held responsibility in terms of both range and depth.

Currency: How recent is the assessor's education, training and experience, and the extent to which the assessor's knowledge and skill have been updated.

6.2 Education

Education is shown in figure 2, item 1. Assessors should maintain evidence of their formal education in terms of certificates and official course outlines for validation. The following levels of educational achievement may be considered as appropriate in the categories of general education, software education, and assessor education.

General education: In general, a degree or equivalent of any discipline from an educational establishment.

Software education: A degree or equivalent in Computer Science, Software Engineering or similar, or as an alternative, formal education in these areas or the software process supplementing a general degree, for example CQA.

Assessor education: Qualification as an assessor or auditor, general assessment experience and specific software engineering education.

6.3 Training

Training is shown in figure 2, item 2. An assessor's training should be recorded (see Annex A) for validation.

Acceptable training would cover at least some aspects of software development.

In order to be familiar with software development and maintenance processes, the assessor should have been trained, or have validated experience, in all the processes in the Engineering (ENG) process category.

Project management or technical leadership training provides a background in the Customer Supplier (CUS) and the Organizational (ORG) process categories. Assessors need not have been trained in each process in the two process categories, but should be familiar and conversant with the topics. Assessors should have extensive training in at least one of the processes in these two process categories.

6.4 Experience

6.4.1. General

Experience is shown in figure 2, item 3. Assessors' experience should be recorded (see Annex B) for validation.

Some of the factors which should be taken into account when assessing the relevance of experience in each of the process categories are addressed in 6.4.2 to 6.4.6 below. In lieu of personal experience, the teaching of the particular subject at a suitable level may suffice.

There is an interaction between experience and training: training alone is insufficient. There is also a beneficial interaction between experiences in different roles. For example, team leaders or managers of projects may have had contact with software configuration management and software quality assurance functions. The experience gained may overlap and cover a number of process categories in any particular assignment.

In consequence, recent graduates, or individuals who have spent their entire working lives in a single process category, are unlikely to have accumulated sufficiently broad experience.

6.4.2. Customer-supplier process category

The key element of these practices is joint customer and supplier interaction. Participation in activities within an organizational unit with a recognized quality management system would be helpful. The provision of customer references would aid verification.

6.4.3. Engineering process category

Assessors should show evidence of work experience that shows the use of some of the development practices within this process category. Experience solely in the development of user documentation is insufficient.

6.4.4. Project process category

Ideally, assessors should demonstrate that they have managed a project or projects in the software industry for a period of at least one (1) year. The project should have included management of subcontracted activities. Experience which shows acceptance of responsibility for human resource management in the project category would be relevant to the selection and training of assessment team members.

6.4.5. Support process category

A key feature of these practices is the development of plans and the measurement of performance against these plans. Relevant experience includes developing project or user documentation.

Assessors should be able to demonstrate familiarity with software quality assurance and quality management systems. Examples include participation in activities within an organization with an approved quality management system, familiarity with independent assessments, or qualification as an auditor or assessor under a national scheme.

6.4.6. Organization process category

Assessors should be able to demonstrate experience as managers, consultants or assessors involved in the processes in this process category.

6.5 Training in assessments using this International Standard

This activity is shown in figure 2, item 4. Assessors' training should be recorded (see Annex A) for validation.

A training course to cover the requirements and assessment elements of this International Standard should comprise at least the following topic areas:

6.5.1. Overview of this International Standard

- Background
- Architecture and principles
- The component parts of the International Standard
- Vocabulary and definitions
- Comparison of this International Standard with other standards/methodologies
- Assessment vs. auditing
- How to use the parts of the International Standard

6.5.2. The process model

(based on part 2 : A model for process management)

- Process categories
- Processes and the base practices
- Capability levels, common features and generic practices
- Extended processes
- How to use part 2 of this International Standard.

6.5.3. Process Assessment

(Based on part 3: Rating processes and part 4 : Guide to conducting assessment)

- Assessment preparation
- Conduct of assessments
- Determination of actual ratings
- Determination of derived ratings
- Validation of ratings
- Presentation of assessment results
- Requirements for conformance
- How to use parts 3 and 4 of this International Standard

6.5.4. Assessment Instruments

(Based on part 5 : Construction, selection and use of assessment instruments and tools)

- Selecting instruments
- Building instruments
- Using Instruments
- How to use part 5 of this International Standard

6.6 Experience of assessments using this International Standard

This activity is shown in figure 2, item 5. Assessors' experience of conducting assessments using this International Standard should be recorded (see Annex C) for validation.

In addition to the training mentioned above, it is recommended that a qualified assessor should have:

- participated as a provisional assessor in at least two (2) assessments conducted according to the provisions of this International Standard
- or participated as a provisional assessor in one (1) assessment and as an observer in three (3) assessments conducted according to the provisions of this International Standard.

Training (clause 6.4) and participation in assessments should be formally documented by the trainer or the assessment team leader respectively.

6.7 Maintenance of the qualification

Assessors should maintain (renew) the qualification (figure 2, item 8) by engaging in a combination of the following activities

- on the job experience as a qualified assessor;
- attending professional seminars;
- giving presentations;
- teaching or developing courses;
- engaging in professional association activities;
- publishing articles or books;
- self training or education using this International Standard;
- active involvement or leadership in the organizational unit's improvement teams.

Assessors' professional activities should be recorded (see Annex D and Annex E) for validation.

6.8 Maintenance of records

The following records should be maintained by all assessors and intending assessors

- educational certificates and course outlines;
- training records (see Annex A);
- verified records of experience (see Annex B);
- verified records of attending training course(s) in this International Standard (see Annex A);
- verified records of participation in assessments conducted according to the provisions of this International Standard (see Annex C);
- assessment logs (see Annex D);
- logs of professional activities (see Annex E).

Annex A (informative)

Training record

The following template may be used to record an assessor's training.

Table 9 - Training Record

Training course	Description of training	Dates	Hours	Training provider

Training course: The name of the training course and where held.

Description of training: A short overview of the training specifying the covered processes and process categories provided by either the assessor or the training provider.

Dates: Start and end dates of training.

Hours: Number of hours of training.

Training provider: The name and the signature of the training provider with the training provider's official stamp or logo. Alternatively, a certificate of completion bearing this information may be attached.

Annex B (informative)

Record of experience

The following is an example of an assessor's record of experience in the software process.

Table 10- Record of experience

Process Category	Description of experience	Dates	Level	Verification
CUS				
ENG				
PRO				
SUP				
ORG				
Other				

Process category: Process categories of the process model in part 2 of this International Standard. The assessor may describe any other category which may be relevant.

Description of experience: Short overviews covering the involvement in different processes within the process categories prepared by the assessor.

Level: Level of involvement (i.e., as an assessor, trainee, management, supervisor). Assessors may describe their involvement in the same process category in more than one cell if the level of involvement is different.

Dates: Dates of involvement in different categories.

Verification: Signature and the position of the supervisor, manager or referee who can verify the assessor's experience in each category.

Annex C (informative)

Record of participation

The following template may be used to record an assessor's participation as a provisional assessor or as an observer in assessments conducted according to the provisions of this International Standard.

The involvement in assessments should be verified by a qualified assessor or the assessment team leader. Each assessment is recorded in a format similar to the one below and is completed by a qualified assessor or an assessment team leader.

Name of the person:
Date:
No. of days for the assessment:
Scope of the assessment:
Process categories/areas assessed by the person:
Organization/Organizational unit:

Effective Communications:

Were the discussions with the customer reasonable?	Yes/no
Was a satisfactory understanding of this International Standard shown?	Yes/no
Was the inter team relationship satisfactory?	Yes/no

Judgement and Leadership:

Were the assessment activities completed in a timely manner?	Yes/no
Were the interviews conducted satisfactorily?	Yes/no

Integrity:

Reasonable sample taken?	Yes/no
Range of activity satisfactory?	Yes/no
Depth of questioning satisfactory?	Yes/no
Review of results consistent?	Yes/no

Rapport :

Communication - telling the good and bad news:	satisfactory/unsatisfactory
Review of the programme:	satisfactory/unsatisfactory
Conduct:	satisfactory/unsatisfactory
Team Management:	satisfactory/unsatisfactory

Comments: (on Diplomacy, Discretion, Persistence and Resistance handling ability)

Performance: Acceptable/More Experience Required/Not acceptable

Name and signature of qualified assessor/ team leader: .....

Annex D (informative)

Assessment log

The following is a sample of an assessment log which may be used to record the details of assessments conducted according to the provisions of this International Standard which an assessor has performed as a qualified assessor.

Table 11- Assessment log

Date	Assessment	No of days	Categories assessed	Verification

Date: Start date of the assessment.

Assessment: A short description of the assessment to be written by the assessor. The description should include the level of involvement of the assessor (i.e.as team member, team leader, team co-ordinator) and the number of assessors in the team.

No of days: Duration of the assessment in days.

Categories assessed: The process categories covered by the assessment.

Verification: The signature of a senior manager of the organizational unit assessed, with the stamp or logo. Individual assessment logs may be retained to maintain confidentiality.

Annex E (informative)

Professional activities log

The following template may be used to record the professional activities of an assessor for maintenance (renewal) of the qualification.

Table 12- Professional activities log

Date	Activity	Location	Hours

Date: Date of the professional activity.

Activity: The title and a short description of the activity.

Location: Address with room numbers if applicable.

Hours: Estimated number of hours of the activity.

Annex F (informative)

Mechanisms for the demonstration of competence

F.1 General

An intending assessor may demonstrate competence in each category through a number of mechanisms. The choice of an acceptable mechanisms may be at the discretion of the sponsor of an assessment or the employer of the assessor. The same mechanisms may be used for self evaluation.

The following are examples of such mechanisms.

F.2 Example 1 for demonstration

Table 2 is an example of a matrix which may be set up to determine the competence of an assessor. The left hand column with the title "Category of competence" consists of the broad categories of competence which an assessor should demonstrate. Each sub-category demonstrated may be written in the appropriate cell under the appropriate method of demonstration (see table 2). Finally the number of sub-topic categories may be counted to determine the level of competence.

Alternatively, the sub-categories (instead of the main topic categories) may be provided in the left hand column with the title "Category of competence". A tick may be placed in the appropriate cell when competence in the particular sub-category is demonstrated. The score, represented by the total number of ticks, may be used to determine the level of competence.

Table 2 - Demonstration of competence against different categories

	Method of demonstration			
Category of competence	**Career progression**	**Technology awareness**	**Breadth of performance**	**Other**
CUS Process Category				
ENG Process Category				
PRO Process Category				
SUP Process Category				
ORG Process Category				
Assessment technology				
Personal attributes				

F.3 Example 2 for demonstration

The following example is based on a joint employee-supervisor review. It encourages assessors to describe their own competencies. This approach is particularly helpful in assessing one's own competence to perform assessments conducted according to the provisions of this International Standard, and if used on a regular basis, for building competence over time.

1. Rate your current level of competence to perform assessments, conducted according to the provisions of this International Standard, on a scale of High/Medium/Low.
2. Rate the level of feedback you received on your performance in assessments in the past (High/Medium/Low).
3. Conduct a joint discussion with your supervisor or referees to identify the areas of competence which are relevant to your current assignment or any past assignments. List the assignments against each area of competence in a matrix. Then list specific actions taken, personal attributes established, or outcomes produced which you have used to demonstrate your competence in each of the relevant areas (table 3).

Table 3 - Demonstration of competence against assignments

Areas of competence	Assignments	How demonstrated
Competence 1	Assignment 1	
	Assignment 2	
Competence 2	Assignment 1	
	Assignment 2	

4. Rate the need for improvement of your competence in software assessment (High/Medium/Low).
5. Develop an action plan to improve your competence. Identify the items or areas to be improved, methods of improvement (e.g., training, reading, work assignments, self-paced learning, mentoring) and ways to measure progress.
6. Implement your plan and describe successes, failures and the reasons.
7. Identify what needs to be done next.

Table 4 - Self improvement

Item to improve	Improvement method	Method to measure progress

Annex G (informative)

Mechanisms for the validation of education, training and experience

G.1 General

Validation of an assessor's education, training and experience may be performed in a number of ways. The choice of an acceptable mechanisms should be at the discretion of the sponsor of an assessment or the employer of the assessor. The same mechanisms may be used for self evaluation.

Example mechanisms are described below.

G.2 Example 1 for validation

The following mechanism is based on allocating points to a number of criteria. The example includes a suggestion of the way points may be distributed, the maximum that may be attained in each category, and the acceptable minimum to become an assessor. The allocation of points may be adjusted based on the duration, range, responsibility, depth, and currency of an assessor's education, training and experience.

	Points
Education (Maximum = 4, Minimum = 2)	
Degree or equivalent level of education in any discipline.	1
Any formal course in the Software Process, Computer Science, Software Development, Software Engineering, or Software Quality	1
Degree or equivalent level of education in the Software Process, Computer Science, Software Development, Software Engineering, or Software Quality	2
Assessor education in terms of a national or an international scheme. (e.g., CQA, TickIT or SEI appraiser)	2

Training (Maximum = 10, Minimum =6)

Customer/Supplier process category [CUS]	1
Engineering process category [ENG]	1
Project process category [PRO]	1
Support process category [SUP]	1
Organization process category [ORG]	1
Training Course on this International Standard	5

Experience (Maximum = 5, Minimum = 3)

Customer/Supplier process category [CUS]	1
Engineering process category [ENG]	1
Project process category [PRO]	1
Support process category [SUP]	1
Organization process category [ORG]	1

Once an assessor's suitability is quantified, the outcome may be as shown in table 5.

Table 5 - Recommended outcome of validation

Number of points scored	Recommended outcome
11 or above	suitable to be an assessor
7 to 10	more education, training or experience required.
below 7	not suitable at present

G.3 Example 2 for validation

The following example is a "check list" type of approach that a sponsor or an employer (or the intending assessor) may use to determine the adequacy of education, training and experience by examining a number of items. (See tables 6, 7 and 8.) A tick may be placed in the appropriate position after the check.

The sponsor or employer should determine the minimum number of fully adequate areas and partially adequate areas which would qualify an assessor to perform an assessment.

Table 6 - Validation of the software process against a checklist

Items to validate	Adequate				Items to Examine	Notes and Commentary
	Fully	Partially	No	Unknown		
Software process						
a. Education					• Education accreditation • Degree earned • Number of credit hours • Subject studied	Base or higher degree in a software related discipline preferred.
b. Training					• Training supplier • Type (video, instructor led etc.) • Classroom hours • Subjects matter • Other assessment models	Training and education alone are not sufficient to qualify an assessor.
c. Experience					• Covers assessment scope • Expertise in at least one process. • Business domain • Application domain • Process variants, if applicable • Other assessment accreditation • Level of responsibility attained	Experience in the process categories and processes of the assessment scope is required.

Table 7 - Validation of assessment technology against a checklist

Items to validate	Adequate				Items to Examine	Notes and Commentary
	Fully	Partially	No	Unknown		
Assessment Technology						
a. Education					• Educational Institution • Degrees or certificate earned • Classroom hours	Formal education may be used to gain understanding of this International Standard. Education alone is insufficient to qualify an assessor.
b. Training					• Trainer credentials • Type (video, instructor led etc.) • Coverage (clause 6.5): – Components of the standard – Process model and baseline practices – Process assessment – Assessment Instruments	Training may be used to obtain knowledge of the components of this International Standard; assessment methodologies; managing and conducting an assessment; design of extended processes as well as identifying the mapping of OU processes to the processes defined in part 2 of this International Standard.
c. Experience					• Previous assessments conducted • Previous assessment and assessor evaluations • Assessment methodologies used • Provisional assessor requirements satisfied • Creating an assessment methodology, if applicable • Assessment Instrument(s)	This is validating the set of experience for consideration of an assessor as a qualified assessor.

Table 8 - Validation of personal attributes against a check-list

Items to validate	Adequate				Items to Examine	Notes and Commentary
	Fully	Partially	No	Unknown		
Personal Attributes						
a. Education					• Education accreditation • Degree earned • Number of credit hours	Formal education may include courses in ethics or business philosophy.
b. Training					• Training supplier • Type (video, instructor led etc.) • Classroom hours • Subject matter: – Total Quality leadership – effective meetings – team building – communication skills – change management	Look for training completion, understanding and application of principles.
c. Experience					Assessment evaluations Presentations Writing skills Leading change (self-assessments)	Experience is the most reliable indication that an individual posses the personal attributes required of an assessor.

Key:

Fully adequate: The information submitted clearly demonstrates that the assessor has the knowledge and skills in the specific area to successfully perform assessments conducted according to the provisions of this International Standard.

Partially adequate: The information submitted indicates that the assessor has at least some of knowledge and skills necessary to successfully perform assessments conducted according to the provisions of this International Standard. Additional information may be requested. Alternately, the composition of the assessment team may be altered to include individuals whose knowledge and skills can augment those of the assessor.

Not adequate: The information submitted clearly indicates that the assessor does not posses the knowledge and skills in the specific areas to successfully perform assessments conducted according to the provisions of this International Standard.

Unknown: The information submitted does not address the specific knowledge and skills outlined in this part of the International Standard. Additional information may be needed before a determination can be made.

Annex H (informative)

Glossary

CQA	Certified Quality Analyst of the Quality Assurance Institute, Orlando, Florida, USA.
SEI	**S**oftware **E**ngineering **I**nstitute, Carnegie Mellon University, Pittsburgh, Pennsylvania, USA.
TickIT	A program for ISO9000 registration of software auditors.

Annex J (informative)

References

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