ISO/IEC JTC1/SC7
Software and Systems Engineering
Secretariat: CANADA (SCC)

# ISO/IEC JTC1/SC7 N4170

**2008-12-03**

| | |
|---|---|
| **Document Type** | **Combined WD circulation and PDTR registration ballot** |
| **Title** | Combined WD circulation and PDTR Registration Ballot, 15504-9, Information Technology — Process Assessment — Part 9: Target Process Profiles |
| **Source** | WG10 |
| **Project** | **15504-9** |
| **Status** | Final |
| **References** | |
| **Action ID** | ACT |
| **Due Date** | 2009-05-18 |
| **Start Date** | 2008-12-05 |
| **Distribution** | SC7 AG |
| **Medium** | PDF |
| **No. of Pages** | 19 |
| **Note** | 2009-02-16: Balloting time has been extended to 2009-05-18 to enable electronic balloting. |

Please vote using the ISO Electronic Balloting Facilities (Resolution 937)

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**ISO/IEC JTC 1/SC 7 N 602**

Date: 2008-11-5

**ISO/IEC PDTR 15504-9.2**

ISO/IEC JTC 1/SC 7/WG 10

Secretariat: SCC

# Information Technology — Process Assessment — Part 9: Target Process Profiles

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Document type: Technical Report
Document subtype:
Document stage: (20) Preparatory
Document language: E

Macintosh HD:Users:fcoallier:Documents:SC7:Secrétariat:Documents émis par FC:Série N4169:07N4170 WG10N602 WD2 ISO_IEC WD 15504-9.doc STD Version 2.1

# Contents

Page

# 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.

In exceptional circumstances, the joint technical committee may propose the publication of a Technical Report of one of the following types:

— type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;

— type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;

— type 3, when the joint technical committee has collected data of a different kind from that which is normally published as an International Standard (“state of the art”, for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

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 TR 15504-9, which is a Technical Report of type 2, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Joint Technical Committee Information technology*, Subcommittee SC 7, *Software and Systems Engineering*.

ISO/IEC 15504 consists of the following parts, under the general title *Information Technology — Process Assessment*:

— Part 1 - Concepts and Vocabulary

— Part 2 - Performing an Assessment

— Part 3 - Guidance on performing an assessment

— Part 4 - Guidance on use for process improvement and process capability determination

— Part 5 - An exemplar Process Assessment Model

— Part 6 - An exemplar system life cycle process assessment model

— Part 7 – Assessment of organizational maturity

— Part 8 – An exemplar assessment model for service management processes

— Part 9 – Target process profiles

This Part of ISO/IEC 15504 is informative.

# Introduction

ISO/IEC 15504 provides a framework for process assessment and sets out the minimum requirements for performing an assessment in order to ensure consistency and repeatability of assessment ratings. Process assessment is applicable in the following circumstances:

— by or on behalf of an organization with the objective of understanding the state of its own processes for process improvement;

— by or on behalf of an organization with the objective of determining the capability of another organization's processes for a particular contract or class of contracts, or to determine the capability of its own processes for a particular requirement or class of requirements.

Process assessment has two dimensions, a process dimension and a capability dimension. ISO/IEC 15504-2 specifies the measurement framework within the capability dimension. The process dimension is provided by an external process reference model, which describes a set of processes, each characterized by defined process purpose and process outcomes. ISO/IEC 15504-4:2004 describes the need for a target capability using the capability dimension in ISO/IEC 15504-2 for each process, in a process reference model, appropriate to the specified requirements. This informative part of ISO/IEC 15504 provides guidance on how to create and utilize target process profiles to meet the need for this target capability.

This part of ISO/IEC 15504 is being developed as a Technical Report Type 2, to enable experience in the use of the approach to setting Target Process Profiles to be gained. In future revisions of the Standard, it is likely that the content of this part will be integrated with part 4 of the standard.

The Technical Report provides guidelines for creating and using a target process profile. These guidelines cover the following aspects:

a) the defined purpose of the target process profile, such as a process improvement initiative or process capability determination;

b) the community of use, such as automotive, aerospace;

c) the business requirement;

d) the domain of application, such as systems, software, IT services management;

e) the categorization scheme for the domain of application, such as safety critical systems;

f) applicable processes or process reference models for the domain of application;

g) the data and information to be collected to ensure the profile is relevant to the community of use, business requirements, domain of application and categorization scheme;

h) the factors that, when analysed, transform the collected data or information into processes and process capability (process attributes and process attribute rating) to create a target process profile for a process in the specified categories for domain of application of the business requirement for the community of use;

i) the expression of results, i.e. a target process profile for each required process, with data and notes that allow traceability and interpretation for assessment and improvement guidance purposes.

# Information Technology — Process Assessment — Part 9: Target Process Profiles

## 1 Scope

This part of the International Standard documents guidelines for target process profiles for Capability Determination and Improvement purposes. This Technical Report provides guidance for target process profiles for the following purposes:

— by or on behalf of an organization with the objective of specifying a target process profile based upon specified needs;

— by or on behalf of an organization with the objective of specifying a target process profile against which to assess the actual capability of the organization to meet that target;

— by or on behalf of an organization with the objective of specifying a target process profile against which to assess the actual capability of another organization to meet that target;

— by or on behalf of an organization with the objective of determining the need for improvement based upon any capability gap between the actual capability and the target process profile.

## 2 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 amendment) applies.

ISO/IEC 15504-1:2004, Information Technology – Process Assessment – Part 1: Concepts and Vocabulary

ISO/IEC 15504-2:2003, Information Technology – Process Assessment – Part 2: Performing an Assessment

## 3 Terms and Definitions

For the purposes of this part of ISO/IEC 15504, the terms and definitions given in ISO/IEC 15504-1 and the following apply.

**3.1**
**target process profile**
A target process profile specifies which process attributes are required and the rating necessary for each process attribute, or the capability level and rating, for a required process.

**3.2**
**target capability**
The set of target process profiles, subject to an acceptable process related risk, which meet the specified requirement for process capability determination or the business goals for process improvement.

# 4 Overview

## 4.1 Introduction

Within ISO/IEC 15504, process assessment can be utilized:

— by or on behalf of an organization with the objective of understanding its processes for process improvement purposes;

— by or on behalf of an organization with the objective of determining the capability of another organization's processes for a particular contract or class of contracts, or to determine the capability of its own processes for a particular requirement or class of requirements.

Within a process improvement context, process assessment provides a means of characterizing an organizational unit in terms of the capability of selected processes. Analysis of the output of a conformant process assessment against an organizational unit's *business goals* identifies *strengths*, *weaknesses* and *risks* related to the processes. This, in turn, can help determine whether the processes are effective in achieving business goals, and provide the drivers for making improvements.

Process capability determination is concerned with analysing the output of one or more conformant process assessments to identify the *strengths*, *weaknesses* and *risks* involved in undertaking a specific project using the selected processes within a given organisational unit. A process capability determination can provide a fundamental input to supplier selection, in which case it is often termed a ‘supplier capability determination’.

## 4.2 Target process profiles sponsor

Target process profiles will usually be required and resourced by a sponsor for the purpose of process capability determination or process improvement – as described in ISO/IEC 15504-1:2004. The sponsor has the authority to ensure that the target process profiles, the process assessment and any agreed ensuing programme for process improvement or required process capability is carried out effectively to meet its intended use. For process capability determination, the sponsor should deploy a process capability determination process as outlined in ISO/IEC 15504-4:2004 Clause 4.5. For process improvement, the sponsor should deploy a process improvement process as outlined in ISO/IEC 15504-4:2004 Clause 4.4.

## 4.3 Target process profiles

The purpose of target process profiles is to identify the desired or required process capability for selected processes with respect to a particular intended use. Clause 5 of this part of ISO/IEC 15504 describes the detailed content of a set of target process profiles. As a result of successful establishment, a target process profile meeting its intended use has the following characteristics:

— a defined purpose;

— a defined community of use;

— a defined business requirement;

— the domain of application;

— the categorization of the domain of application;

— the applicable processes or process reference models for the domain of application;

— the applicable process assessment model for the domain of application;

— the data and information collected to create the target process profile is representative of all relevant aspects of the community of use for the specified categories of the domain of application for the business requirement;

— traceability from the input data to the results;

— the process, process attributes and rating for each process attribute, or process capability level rating, are derived from the identified base and generic practices that are in turn based upon the data and information collected;

— a defined expression of results, i.e. target process profile for each required process, with data and notes that allow traceability and interpretation for process assessment, improvement and capability determination guidance purposes;

— criteria to assess the effectiveness of the target process profiles.

NOTE 1 The intended use is defined by the first five characteristics in the above list. It becomes a defined requirement specifically based upon this set of characteristics. If any of these characteristic is changed, the intended use changes and a target process profile should be checked if it is still applicable or requires rework.

NOTE 2 A defined community of use could be at industry level, enterprise level, team/project level, or professional/technical level.

NOTE 3 A defined business requirement may be setting target process profiles for medical device systems; another may be setting target process profiles for security software suppliers.

NOTE 4 The domain of application may be for systems, software or services; for example IT service management.

NOTE 5 The categorization of the domain of application refines the way the domain is further specified. For example, if the domain of application is defined as safety critical software, there may be several categories of safety critical software, ranging from human safety critical to software with minor or no safety criticality.

NOTE 6 Normally the target process profile should refer to an existing and applicable process reference model, so that this model is also used for the process assessment. However the profile may need to refer to processes not in any existing model, due to the domain of application and its categorization. In these cases, the process should be defined in the same way as processes in a process reference model, as required by ISO/IEC 15504-2.

## 4.4 Deploying a documented process

Organisations should deploy a documented process to specify target process profiles that meet an intended use. Clause 6 of this part of ISO/IEC 15504 describes in detail the content and performance of such a documented process. The intent of the process is to provide reproducible and traceable results. Such a documented process should:

— take account of the guidance contained within this part of ISO/IEC 15504;

— take account of the guidance contained within ISO/IEC 15504-4:2004;

— include or reference an assessment process which satisfies the requirements set out within ISO/IEC 15504-2:2003 and accords with the guidance set out in ISO/IEC 15504-3:2004;

— specify the intended use of the target process profiles;

— specify the type of data and information needed to create a profile applicable to the intended use;

— specify the techniques and activities to create and use target process profiles and provide guidance in their use;

— specify the appropriate roles;

— specify the qualifications, experience and skills of persons using the documented process.

NOTE Training may be used to satisfy the need for qualifications and skills.

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# 5 Target process profiles

## 5.1 General

The value in a target process profile is its ability to clearly address the process improvement and process capability determination needs in clause 4. The set of target process profiles expresses the *target capability* which the sponsor judges to be adequate, subject to an acceptable *process related risk,* for meeting the defined business requirements (see note). Target process profiles are derived from the defined business requirements, traceable to one or more specific base practices and one or more generic practices that meet these requirements. These in turn enable the sponsor to select the appropriate process attributes and a required rating for each process attribute or select the appropriate capability level and process capability level rating.

In general, it is recommended that the sponsor selects one or more existing process reference models and uses the processes in the selected models as the basis for determining the process capability of each selected process within the models. Should the sponsor need to define additional processes to meet their business requirements, the resultant target process profile would be considered as nonconforming for process capability determination purposes as defined in ISO/IEC 15504-4:2004.

As a result, a set of target process profiles will consist of a set of processes and process attribute ratings at various process capability levels that are specifically applicable to the intended use. Therefore, a set of target process profiles cannot be generic (e.g. all processes to be capability level 2 or capability level 3) as this will not address the specified business requirement, domain of application and categorization nor specifically determine the specific base and generic practices (see note 2) that meet the intended use.

NOTE 1 The sponsor may appoint persons or teams to perform the work in defining and using target process profiles.

NOTE 2 Software that needs to meet human safety critical business needs (i.e. a specific domain of application) has different requirements to software used to create personal web sites. Within any domain of application, some of the selected processes will need to be at higher process capability levels in order to achieve acceptable process related risk, while the other selected processes that have less effect on the process related risk should be effective at lower process capability levels.

## 5.2 Defining a target process profile

### 5.2.1 Defining the purpose

The sponsor selects or defines the purpose for the target process profiles. This defines whether the profile is to be used for process capability determination or process improvement.

### 5.2.2 Select the community of use

The sponsor selects or defines a community of use for the target process profiles. Target process profiles should vary depending upon the community of use. Hence an industry-wide community of use must be applicable across various industry participants with different enterprise business models, while an enterprise based community of use should embrace the specific enterprise business model. Similarly, a team or project oriented target process profile should embrace more specific team or project needs. The community of use may be based upon:

— a defined industry, e.g. automotive, medical devises, telecommunications, aerospace, IT services, finance, insurance;

— an enterprise level community, i.e. a specific enterprise with a specific business model, hence allowing for enterprise processes and characteristics that may drive competitive advantage in comparison to other enterprises;

— a team or project level within an enterprise with a specified set of business needs, e.g. software project teams in a enterprise application supplier, that may allow more specific guidance for improvement of teams and projects;

— a professional or technical community of use (see note), that should allow the community to define various levels of target capability for application of its processes.

NOTE A professional or technical community may be a specific software development community, IT service management, project management community or similar body.

### 5.2.3 Define the business requirement

The sponsor selects or defines the business requirement so that it is clear to which business needs the target process profiles is applicable. For example, the sponsor may define the business requirement to cover medical device software with potential human safety issues (both to patients and operators) should a medical device running the software not perform correctly. Alternately, the sponsor may define the business requirement on the basis of financial loss, security or other business risk based criteria.

### 5.2.4 Define the domain of application

The sponsor selects or defines a domain of application for the target process profiles. The domain of application should guide the creation of the target process profiles with respect to what process model and processes are selected. It should also guide users of target process profiles to select an applicable profile for its intended purpose and relevant organization, for example a system supplier or a software supplier.

A domain of application may be broadly defined, for example for systems, software or IT services; or may be narrowly defined, for example software for electrical control units for automotive speed control; or anywhere between. The more narrowly defined the domain of application, the more likely will be the need to define specific processes and their capability, and hence the better the guidance and applicability to specific users of the target process profiles. On the other hand, a too narrow definition will reduce the overall applicability of the target process profiles. A broadly defined domain of application will generally apply to more users. On the other hand, a too broadly defined domain of application will result in less useful guidance and a greater potential need to adapt the profile to suit its application to specific users.

### 5.2.5 Define categories

The sponsor defines categories or selects a categorization scheme for the domain of application. The categorization scheme is used to determine process capability of selected processes with the aim to reduce *process related risk*. Hence, the categorization scheme should clearly define criteria that specify any requirement for multiple levels of process capability which guide determination of the number of target process profile sets required and the creation of each target process profile set.

Categories may be based one or more (combination) categorization criteria. These may include:

— Business/Service criticality criteria

— Safety criticality criteria

— Financial criteria

— Operational criteria

— Delivery criteria

— Quality criteria

— Mission or functional criteria

— Timeliness criteria

For example, a categorization scheme that uses safety criticality criteria should result in several *categories* of safety, for example ranging from human safety critical through human safety important to moderate/low safety importance, or even no safety relevance.

When the process related risk varies in each category, it is highly likely that each selected process has a different process capability commensurate to the varying process related risk. Hence each separate category should result in a separate target process profile. Well defined categories will clearly guide users in selecting the correct set of target process profiles with the appropriate process attributes or capability levels to reduce the process related risk and meet the business requirement for the domain of application and community of use.

### 5.2.6 Define target process profile factors

The sponsor defines how to determine which processes are most likely and effective to reduce the process related risk for the defined categories in the domain of application for the business requirement.

This determination should use a factor that guides data collection to identify the process aspects which reduce process related risk or increase the possibility to achieve the business requirement (see note 1). This factor also guides determination of the level of significance of each of the identified processes or practices. In order to determine the level of significance of practices and processes, the factor addresses the likelihood (*probability)* and effectiveness (*consequence*) of a practice or process to achieve the business requirement for each defined category in the domain of application. This factor is referred to as a *probability factor* hereafter. There are two ways for probability factors to meet these criteria:

— reduce the probability of failing to achieve the criteria, which is *risk* based (see note 2);

— increase the possibility of achieving the criteria, which is *value creation* based (see note 3).

The sponsor defines whether a target process profile analysis uses either or both types of probability factors.

Alternatively, the sponsor may refer to the selected documented process that defines the types of probability factors used.

The sponsor creates a list of probability factors. This list should be as comprehensive as possible for each category in the domain of application of the business requirement for the community of use. As required, the outcome of this activity comprises:

— a list of risks, grouped into related risk areas, in order to be used as the basis for collecting evidence of practices that mitigate the risks to the business requirement;

— a list of value creation factors, grouped into related value creation areas, in order to be used as the basis for collecting evidence of practices that improve the possibility of achievement of the business requirement.

The sponsor ensures the list of probability factors is available to guide data collection and subsequent analysis.

The analysis of data collected using these factors relates the data/information collected for each category in a traceable manner to base practices, generic practices and hence to process attributes and ratings, and process capability levels.

NOTE 1 A target process profile is predictive in nature; it is a statement of target capability that aims to reduce process related risk and increase the possibility of achievement of the business requirement. Therefore the use of probability oriented factors is compatible with the predictive nature of a target process profile.

NOTE 2 Using risk based analysis is compatible with process assessment for Process Capability Determination (PCD) purposes. PCD assesses an organization's processes to determine their suitability for the specified requirement and identifies gaps between target and assessed capabilities that can be analysed to determine overall process related risk (ISO/IEC 15504-4:2004 Clause 4.5). Therefore the sponsor may choose to define target process profiles solely based upon risk factors.

NOTE 3 Value creation factor analysis uses the possibility to influence (probability) and effectiveness (consequence) to achieve the criteria. The sponsor may choose to use value creation factor analysis when specific processes are thought to positively influence achievement of the business requirement.

### 5.2.7 Define criteria for data and information collection

The sponsor defines criteria for collecting data and information used to define the target process profile. The criteria cover the following:

— the type of data and information collected;

— the data sample size;

— how to ensure the collected data and information is representative of the community of use;

— the relationship of the data and information to a factor that can be used to derive the target process profile;

— traceability between data/information and the target process profile results.

The criteria ensure that data/information are collected for each defined category in the domain of application for the defined business requirement. The criteria ensure that data/information are collected using a factor that relates to the processes, practices and activities which reduce the *process related risk* (as defined in ISO/IEC 15504-4:2004) and increase the *possibility* of achieving the business requirement. The data/information collected should be representative of all relevant aspects of the community of use for the defined categories in the domain of application for the business requirement. The sponsor should define the data/information collection sample size required to ensure a significant number of data points are collected or refer to the selected documented process which defines data/information collection requirements (see notes).

For a target process profile to be useful for its intended purpose, the community of use must have confidence in the way it has been derived. This requires traceability from the input data/information to the target process profile so that the results are reproducible. This traceability should be clearly defined. The sponsor may provide a statement covering traceability based upon the method used.

NOTE 1 If data are collected through interviewing people involved in performing selected processes, this requires interviewing a sufficient number of people to determine which practices they follow. This requires multiple data/information points to be collected for each process and practice, as well as a comprehensive set of viewpoints (i.e. all factors considered from various aspects such as project management, development, quality assurance and the customer). The number and type of people interviewed is determined based on the combined data/information for all interviews. Data/information is considered representative when it is judged to be statistically significant and allows reliable analysis using expert judgment.

NOTE 2 The data/information collected through interviews are likely to point to many processes, practices and process attributes. Subsequent analysis must determine which processes and process attributes are significant and which are not. This can be guided by appropriate choice of factors that relate the data/information to the fulfilment of the business requirement for each defined category in the domain of application for the business requirement.

NOTE 3 If data collection is based upon automated or semi-automated process control measurements, the number of data points are determined based upon accepted statistical process control practices.

### 5.2.8 Select processes

The sponsor selects a set of processes based upon the defined business requirement and the domain of application. The set of processes is reviewed and the appropriate Process Reference Model(s) are identified; a process reference model describes a set of processes in terms of purpose and outcomes as defined in ISO/IEC 15504-2.

The sponsor should determine which process reference model(s) will best suit the intended use, following the guidance in ISO/IEC 15504-3 on the selection of suitable process reference models. The sponsor should determine which processes from the chosen process reference model(s) are needed to meet the intended

use. In some cases the sponsor may select a subset of the processes from the process reference model to meet the intended use. Based on this, the sponsor will identify suitable Process Assessment Model(s).

Where target process profiles are required for processes that are not aligned with any recognised domain standard, appropriate process models or processes may still be defined and used. In these cases, a process should be defined in the same way as process in a process reference model, as required by ISO/IEC 15504-2. A note should be made that these processes are not part of a conformant process assessment, but are additional information.

The sponsor documents the reasons for these choices. For the set of processes as a whole, the sponsor documents, as a minimum:

a) the statement of purpose;

b) the community of use;

c) the business requirement;

d) the domain of application;

e) the defined categories for the domain of application and business requirement;

f) the process reference models used;

g) the set of processes selected from the chosen process reference model.

NOTE 1 In the ongoing development of ISO/IEC 15504, there are additional process reference models being developed. Users of this standard are advised to check with ISO for these additional models.

NOTE 2 The sponsor may select an industry based process reference model for a defined community of use. Target process profiles and a process assessment using these profiles will be conformant when used for the intended purpose.

### 5.2.9 Define target process profile output

The sponsor defines the required target process profile output.

For each process in the selected set, a statement of the target process profile is provided comprising:

a) the process name and identifier;

b) the process reference model and process assessment model;

c) the process purpose;

d) traceability information from the collected data via the probability factors to the required capability level or process attributes;

e) the required process attributes and attribute rating or process capability level and process capability level rating for each defined category, together with a rationale for the required capability level or process attributes (see note 1). The rationale clearly describes what base and generic practices, via the probability factors, are required for the required capability level or process attributes for each defined category. This rationale supports process assessment and improvement purposes;

f) the supporting processes;

g) the required additional methods or techniques that are not in the selected process reference model processes;

h) notes on applicability and use.

The target process profile should provide the following additional information to guide users:

a) a means to identify key and significant processes that affect achievement of the business requirement for each defined category in the domain of application (see note 2);

b) a classification showing for the selected process the probability factor coverage and importance for the defined categories, and when it is a key or significant process;

c) complementary processes, methods and techniques not in the selected process that help to achieve the business requirement.

NOTE 1 The target process profile may specify a target capability to be fully or largely achieved. If specifying process attribute targets, the profile documents whether all process attributes at the target capability level shall be fully or largely achieved or whether one shall be fully achieved and the other largely achieved.

NOTE 2 A key process clearly affects the achievement of the business requirement. For risk based analysis, a key process mitigates (reduces) or remove one or more important risks and is the only process to mitigate at least one of those risks. In addition, a key process may mitigate a large number of risks within one or more risk areas. A significant process significantly affects the achievement of the business requirement. For risk based analysis, a significant process should be one of a few processes to mitigate one or more risks but may not necessarily remove any one risk. In addition, a significant process may mitigate a significant number of risks within one risk areas.

#### 5.2.10 Define target capability

The sponsor defines what is expected for a statement of target capability, comprising the set of target process profiles, in accordance with clause 5.3 of ISO/IEC 15504-4:2004.

## 6 Process for creating, selecting and using Target Process Profiles

### 6.1 Overview

The sponsor selects or defines a documented process for creating and using target process profiles as defined in clause 5.

This should clearly describe the approach and steps followed to produce the target process profiles, so that suitably qualified persons can use the method to produce conformant target process profiles.

In addition to the matters covered in clause 5, the documented process defines the following:

— the requirements for data/information collection comprising use of: statistical process data, interviews, number and type of functional areas and persons interviewed, use of existing data sources, required sample size, criteria for significance and traceability;

— the specification of the probability factor, covering the use of probability and consequence (see note);

— how to relate probability factors to the data/information collected for each category so it is traceable;

— how to collate the probability factors and data/information collected for each category;

— how to analyse the collated data/information via the probability factors to the processes and practices in order to determine capability levels or process attributes and rating of each process for each defined category in the domain of application of the business requirement.

— additional information required to support the target process profile.

NOTE There are several commonly accepted ways to specify probability factors. For risk analysis, it is common practice to specify the overall probability of occurrence and severity of consequences. It is also possible in risk analysis or value creation to specify the number of opportunities for an event to occur, the probability for each occurrence of the

event, and the consequences. The documented process should define how probability and consequence are measured. This may be by using qualitative evaluation (high, medium, low) or more precise criteria: for example, % probability and consequences in actuarial amounts.

## 6.2 Create the target process profiles

The sponsor applies the selected documented process to create the target process profiles for the intended use. In cases where the sponsor does not select the documented process, the persons or teams creating the target process profiles select a conformant documented process and agree upon its use with the sponsor.

When creating the target process profiles, the responsible persons:

a) collect the data/information that meets the guidelines of clauses 5.2.7 and 5.2.8 taking care to ensure the data is representative of all the areas in the defined community of use (see note 1);

b) ensure that sufficient data/information points are collected and all relevant probability factors, processes and practices are covered for each category in the domain of application of the business requirement;

c) analyse the data/information to collate probability factors related to each category and determine the significant probability factors (see note 2);

d) for each category in the domain of application of the business requirement, :analyse the data/information to determine which business practices and processes have the highest likelihood to affect the significant probability factors (see note 3).

e) from the results of this analysis, assemble and document the set of processes for which target process process profiles will be created:

    1) for each process in the set, analyse the data/information, for the significant probability factors, to derive the significant base and generic practices that in combination specify the process, process attributes and rating for each process attribute or process capability level (see note 4). Not all the generic practices/practice performance indicators may be required to achieve the desired performance. The significant practices need to be noted in the rationale so that they can guide process assessment and improvement;

    2) create a target process profile for each process with the required information;

    3) document the target process profile;

    4) repeat for each process.

f) review the target process profiles to ensure that processes that strongly interface to and rely on each other have consistent targets;

g) verify that the completed target process profiles represent an effective profile for the intended use (see note 5);

h) repeat for each category;

i) compile the target process profiles into a target capability statement (see note 6).

The set of target process profiles expresses the target capability which the sponsor judges to be adequate, subject to an acceptable process related risk, for meeting the intended use (see notes 4 and 6).

NOTE 1 Data/information collection must avoid introducing biases so that the subsequent analysis is representative of the community of use, and the selected categories in the domain of application of the business requirement. For example, interviews of people involved in a software development project should cover all roles and functional areas affected, including customers, managers, support personnel and developers. Interviews should also collect data for each category as the process related risk is very likely to vary by category.

NOTE 2 Not all probability factors affect each category, and some probability factors will have a greater impact than other factors. The probability factor to category correlation should highlight which factors have significant effect upon achieving the business requirements. These are called significant probability factors. The generic practices and the process attributes are derived from the analysis of the collated process data for these significant probability factors.

NOTE 3 If the method specifies key and significant processes, they are determined during this analysis. The process to significant probability factor correlation should highlight which processes significantly affect the achievement of the business requirements.

NOTE 4 The target process profile may specify a target capability to be fully or largely achieved. The target process profile documents whether all process attributes at the target capability level shall be fully or largely achieved or whether one process attribute shall be fully achieved and the other largely achieved. ISO/IEC 15504-2 specifies that the process attributes at capability levels lower than the target level shall be fully achieved in order to achieve a rating of largely or fully achieved the higher level. The only exception is that a process attribute may not be required at the next lower level, although this is unlikely to be specified for a target process profile due to the cumulative nature of the process attributes.

NOTE 5 The sponsor should determine criteria for effectiveness. These may be verified by activities such as independent review, pilot implementation and review, or acceptance by the community of use.

NOTE 6 It must not be assumed that the resultant target process profiles for a selected process reference model will be the same for different communities of use, as differing business requirements and categories should lead to different process attribute levels for selected processes.

## 6.3 Using target process profiles

### 6.3.1 User Guidance

The target process profile output should allow the user to:

— understand the intended use of the target process profile;

— know when to apply the entire set of target process profiles;

— know when and how to select and apply a subset of target process profiles (see note 1).

— select the required processes;

— select the required capability level and rating, or process attributes and process attribute rating, for each selected process for the required category in the domain of application of the business requirement to reduce the process related risks;

— understand the specific base and generic practices that lead to the capability level or process attributes and rating, as described in the rationale, so that these significant practices are the focus of assessment or improvement;

NOTE 1 A Process Capability Determination sponsor may use parts of the target process profile set tailored to the work performed by a particular supplier or internal group (i.e. a subset of target process profiles). The sponsor may use subsets for several suppliers. The subset of target process profiles for each supplier may have selected target process profiles that are specific to each supplier as well as shared target process profiles common to several suppliers.

### 6.3.2 Application for gap analysis

The use of target process profiles is described in ISO/IEC 15504-4:2004, Annex A provides information on how to analyse process related risk related to gaps between a target capability and the actual or assessed capability.

In general, the failure to achieve the target Process Attributes and by implication the Capability Levels affects the probability of not meeting the business need(s), hence it increases process related risks. This failure to achieve the target Process Attributes is called the Process Attribute gap. Similarly, a failure to achieve the

target Capability Level is called the Capability Level gap. The following table summarizes the process related risks exposed by capability level gaps.

**Table 1 — Consequence of capability level gaps.**

| Gap at Capability Level | Risks | Notes |
|---|---|---|
| CL 1 **Performed** | Specific process related risks identified in the target process profile as mitigated by the Process Attribute 1.1 (Process performance), i.e. the process base practices for the selected process.<br>Reduction in ability to produce acceptable quality.<br>Work products not produced.<br>Reduction in ability to prevent time or cost overruns.<br>Missing or inadequate work products.<br>Reduction in cost effectiveness.<br>Reduction in uniformity of performance over time or in different organizational instances (e.g. different projects).<br>Reduction in ability to predict performance.<br>Reduction in ability to detect problems in time.<br>Reduction in cost/time/resource optimisation.<br>Reduction in ability to cope with changes in technology. | Quality and work products are the fundamental outcomes of a Performed process.<br>Note: Each Capability Level gap brings specific risks, and infers that all risks associated with higher Capability Levels apply when the target is set for the higher Capability Level. |
| CL 2 **Managed** | Specific process related risks identified in the target process profile as mitigated by the generic practices in Process Attribute 2.1 (Performance management) and Process Attribute 2.2 (Work product management) for the selected process.<br>Reduction in ability to prevent time or cost overruns.<br>Missing or inadequate work products.<br>Reduction in cost effectiveness.<br>Reduction in uniformity of performance over time or in different organizational instances (e.g. different projects).<br>Reduction in ability to predict performance.<br>Reduction in ability to detect problems in time.<br>Reduction in cost/time/resource optimisation.<br>Reduction in ability to cope with changes in technology. | Managing the time and cost to achieve the process, and managing work products are outcomes of a Managed process. |
| CL 3 **Established** | Specific process related risks identified in the target process profile as mitigated by the generic practices in Process Attribute 3.1 (**Process definition)** and Process Attribute 3.2 (Process deployment) for the selected process.<br>Reduction in cost effectiveness.<br>Reduction in uniformity of performance over time or in different organizational instances (e.g. different projects).<br>Reduction in ability to predict performance.<br>Reduction in ability to detect problems in time.<br>Reduction in cost/time/resource optimisation.<br>Reduction in ability to cope with changes in technology. | Use of defined process based upon a tailored standard process, and the deployment including proper resource allocation are outcomes of the Established process. |

| | | |
|---|---|---|
| CL4 **Predictable** | Specific process related risks identified in the target process profile as mitigated by the generic practices in Process Attribute 4.1 (**Process measurement)** and Process Attribute 4.2 (Process control) for the selected process.<br>Reduction in ability to predict performance.<br>Reduction in ability to detect problems in time.<br>Reduction in cost/time/resource optimisation.<br>Reduction in ability to cope with changes in technology. | Operation of a process within defined limits using measurement to manage and change the process performance is outcomes of the Predictable process. |
| CL5 **Optimising** | Specific process related risks identified in the target process profile as mitigated by the generic practices in Process Attribute 5.1 (**Process innovation)** and Process Attribute 5.2 (Process optimisation) for the selected process.<br>Reduction in cost/time/resource optimisation.<br>Reduction in ability to cope with changes in technology. | Continuous improvement and process innovation are outcomes of the Optimising process. |

# 7 Qualification of persons

A well defined target process profile set should provide guidance so that persons using the profiles should only require minimal training and experience in order to be effective. In order to correctly use a target process profile, the sponsor, or duly appointed user:

— has successfully selected a set of target process profiles under supervision of an experienced sponsor.

— is conversant with using ISO/IEC 15504 for process improvement or capability determination purposes.

Defining target process profiles requires skill and experience of a nature similar to that required for an experienced lead assessor and assessment model developer. In order to correctly define a target process profile the sponsor, or sponsor appointed person or team, should meet the following education and experience criteria:

— be a competent assessor (see ISO/IEC 15504-3);

— be able to demonstrate competence in using the selected documented process to create target process profiles under supervision of an experienced user of the documented process.

# 8 Bibliography

The following referenced documents are indispensible 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 amendment) applies.

ISO/IEC 15504-3:2004 Information Technology – Process Assessment – Part 3: Guidance on performing an assessment

ISO/IEC 15504-4:2004, Information Technology – Process Assessment – Part 4: Guidance on use for process improvement and process capability determination.