



## User References, Continued

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### References to unchecked items

Notice that there can be references to items in the checklist that are not checked. These references can be used as pointers to areas of the organizational document that can be improved.

**Example:** The previous checklist contains several items that are not satisfied. The references serve as pointers to the location in the organizational process documentation where improvements might be made in the future.

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## User References, Continued

### Example

Consider the following scenario:

A user is reviewing an organizational document against the SPF and wants traceability (from the SPF to the organizational document). The user places a reference to the organizational document in the “References” column (e.g., chapter, section, page, paragraph) of the SPF. Abbreviations are used since blank space is limited, and there are numerous reference boxes to fill in.

In the example below, “V1” is an abbreviation for “Volume 1”; “V2” is an abbreviation for “Volume 2”; and “S” is an abbreviation for “Section.” In this example, the numbers allow traceability to the exact page and subsection of the hypothetical organizational document.

<b>SCM Process - Exit Criteria</b> , Continued			
<b>Output-based Exit Criteria, continued</b>	The table below describes the states that outputs must satisfy to exit the software configuration management process, continued from the previous page.		
	√	Output	State
	SCM plan	<input checked="" type="checkbox"/> development is coordinated or implemented by the <b>SCM group</b> . (L2-75, Ab2, 2) <input checked="" type="checkbox"/> distribution is coordinated or implemented by the <b>SCM group</b> . (L2-75, Ab2, 2) <input type="checkbox"/> maintenance is coordinated or implemented by the <b>SCM group</b> . (L2-75, Ab2, 2) <input checked="" type="checkbox"/> is prepared for each software project according to a documented procedure. (L2-76, A1) <input checked="" type="checkbox"/> is developed in the early stages of, and in parallel with, overall project planning. (L2-76, A1, 1) <input checked="" type="checkbox"/> is reviewed by the <b>affected groups</b> . (L2-77, A1, 2) <input checked="" type="checkbox"/> is managed and controlled. (L2 - 77, A1, 3) <input type="checkbox"/> is documented. (L2-77, A2) <input type="checkbox"/> is approved. (L2-77, A2) <input type="checkbox"/> is used as the basis for performing the SCM activities. (L2-77, A2)	VI S2.3.6  VI S2.3.6  VI S2.3.6  V2 S1.1  V2 S1.2  V2 S1.3  V2 S1.4  V2 S1.5 V2 S1.6 V2 S1.7

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# User References

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**Introduction** In addition to tracing process documentation back to the CMM, it is also important for organizations to trace from the SPF to their process documentation. This section describes the feature that provides this capability.

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**Expected use** User references are used to:

- Identify the location of the organizational process documentation that addresses a process element in the SPF.
- Indicate the suggested location of the organizational process documentation that should address a process element in the SPF that is not currently being addressed by the organization.
- Provide traceability from organizational process documentation to the SPF, and therefore, to the CMM.

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# Work Product Translation Table

**Purpose** The work product translation tables provide the ability to translate CMM names for work products into your organization’s terminology.

**Note** There are two types of work product translation tables. They are:

- input translation tables, and
- output translation tables.

**Location** The work product translation tables are embedded as part of the input and output checklists for each key process area.

**When to use** Work product translation tables should be completed when the process inputs and outputs are being addressed.

**Use** Use the following procedure for completing the work product translation tables.

Step	Action
1	Read the CMM work product from the input or output column of the checklist, and list the equivalent organization work product(s) in the “Org. Input” (for inputs) or “Org. Output” (for outputs) column in the checklist.
2	Place a reference to the organization’s process documentation for that work product in the references column of the SPF.
3	Repeat steps 1 and 2 for the rest of the table.

**Example** The following table provides an excerpted example of an input translation table from the requirements management process translating CMM inputs into a fictitious organization’s inputs. Output translations would result in similar results.

√	Input	Org. Input	References
✓	Statement of Work. (L2-14, Ab1) [Refer to Level 2 Standards for additional information regarding a statement of work.]	<i>SOW</i>	<i>DID 1000.5</i>
✓	Allocated requirements. (L2-18, A6, 1.4) [Refer to Level 2 Standards for additional information regarding allocated requirements.]	<i>SRS</i> <i>IRS</i>	<i>DID 1000.6</i>

# General Term Translation Table

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**Introduction** Since the CMM is broadly applicable, it is unavoidable that some terms will need to be further defined for each organization. The general term translation tables are a tool for translating general terms used by the CMM into organization-specific terminology.

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**Location** The general term translation tables are located in Appendix D of the SPF.

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**When to use** The general term translation table is used early in any activity involving the SPF, typically after performing role translations.

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**Use** To use the general term translation table, simply read the CMM general term from the left column of the table and list the equivalent term from your organization in the right column.

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**Example** The following table provides an excerpted example of a general term translation table.

<b>CMM General Terms</b>	<b>Your Organization's Terms</b>
Product	<i>Deliverable</i>
Project	<i>Project</i>
Software product	<i>CSCI/CSCU</i>
Software project	<i>Software task</i>
System	<i>Product</i>

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# Role translation table

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**Introduction** In order to be widely applicable, the CMM uses roles that are not specific to one organizational structure. The role translation table provides the ability to map generic CMM roles to the roles found in your organization.

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**Location** The role translation tables are located in Appendix C of the SPF.

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**When to use** The role translation table is typically used first in any activity involving the SPF.

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**Use** To use the role translation table, simply read the CMM role from the left column of the table and list the equivalent role(s) from your organization in the right column.

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**Guidance** Completing the role translation table may be an iterative activity. For example, if you are addressing only one KPA, then you should only complete the table for the roles identified in that KPA.

**Note:** The roles checklist included in each KPA section of the SPF indicates the roles involved in a particular KPA.

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**Example** The following table provides an excerpted example of a role translation table.

<b>CMM Role</b>	<b>Your Organization's Role(s)</b>
Affected groups or other affected groups	<i>SQA</i> <i>SCM</i> <i>Marketing</i> <i>Sales</i> <i>Technical staff</i> <i>Testing department</i> <i>And so on...</i>



Project manager	<i>Project leader</i>
Project software manager	<i>Project leader</i>
Senior management	<i>Senior management steering committee</i>
Software engineering process group	<i>SEPG</i>
Senior manager	<i>CEO</i>
Software engineering staff	<i>Technical staff</i>

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# Translation Tables

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**Purpose** The purpose of the translation tables is to provide an organization with a tool to translate CMM terminology into their own terminology.

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**Rationale** Making the translation assumptions explicit has proven to be beneficial in practice. Experience has shown that there is rarely a one-to-one mapping of terminology, and there are usually “gray” areas that should be documented. There can also be different terminology within the same organization (e.g., projects or divisions within the same organization may use different terminology).

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**In this section** This section describes three types of translation tables.

<b>Translation table</b>	<b>Page</b>
Role translation table	Features-12
General term translation table	Features-13
Work product translation table	Features-14

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## Entry and Exit Criteria, Continued

**Description:  
Entry criteria**

We used the following rule to determine whether entry criteria were input based or general.

**Note:** The examples are taken from the requirements management key process area.

IF the criteria contain state information about an...	THEN they are...	Example
input	input-based entry criteria	Input: Allocated requirements State: are documented.
activity or role	general entry criteria	The project follows a written organizational policy for managing the system requirements allocated to software.

**Description:  
Exit criteria**

We used the following rule to determine whether exit criteria were output-based or general.

**Note:** The examples are taken from the requirements management key process area.

IF the criteria contain state information about an...	THEN they are...	Example
input	general exit criteria	The allocated requirements are reviewed, and problems are resolved before the <b>software engineering group</b> commits to them.
output	output-based exit criteria	Output: Commitments resulting from the allocated requirements State: are negotiated with the <b>affected groups</b> .
activity or role	general exit criteria	The activities for managing the allocated requirements are reviewed with <b>senior management</b> on a periodic basis.

# Entry and Exit Criteria

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## Definitions

*Entry criteria* are the conditions under which an activity can be started. Entry criteria often take the form of a simple or compound predicate about the state of a work product, role, or activity.

### Example:

Input	State
Allocated requirements	are documented. (L2-3, C1, 1)

*Exit criteria* are the conditions under which an activity can be declared complete. Exit criteria often take the form of a simple or compound predicate about the state of an artifact, role, or activity.

### Example:

Output	State
Project's software development plan	includes defect prevention activities. (L5-3, C2, 1)

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## Note

Many of the key process areas, once started, end when the project (or organization!) ends. For these processes, one way to evaluate whether exit criteria are being met by the process description is to answer the following question:

*If the process was executed as described, would it result in the exit criteria being satisfied?*

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## Types of criteria

Entry and exit criteria have each been partitioned into two types — input and output based and general. The major determinant for the type of criteria is *state* information. State refers to the status of a work product when entering (entry state) or exiting (exit state) a process.

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# CMM Role Identification

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**Introduction** The CMM identifies many roles. This section describes how the SPF highlights the roles found in the CMM. This feature should help you use the SPF to determine the responsibilities of each role defined in the CMM.

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**Definition:  
Types of roles** The SPF defines roles as *active* or *passive* depending on the context given in the CMM. The following table provides the basis for defining a particular appearance of a role as active or passive.

IF the occurrence...	THEN the role is...	Example
refers to an activity the role participate in	Active	The <b>software quality assurance group</b> reviews and/or audits the...
indicates the existence of a role	Passive	A group that is responsible for coordinating and implementing ... exists.
is modifying a work product	Passive	Subcontractor's plans.

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**Identification:  
Active roles** The SPF uses **bold** typeface to indicate the occurrence of an active role.  
**Note:** In the roles checklist, only the role being described is presented in bold typeface.

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**Identification:  
Passive roles** The SPF uses normal typeface for occurrences of passive roles.

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**Example** The following example illustrates the use of bold typeface in the SPF.

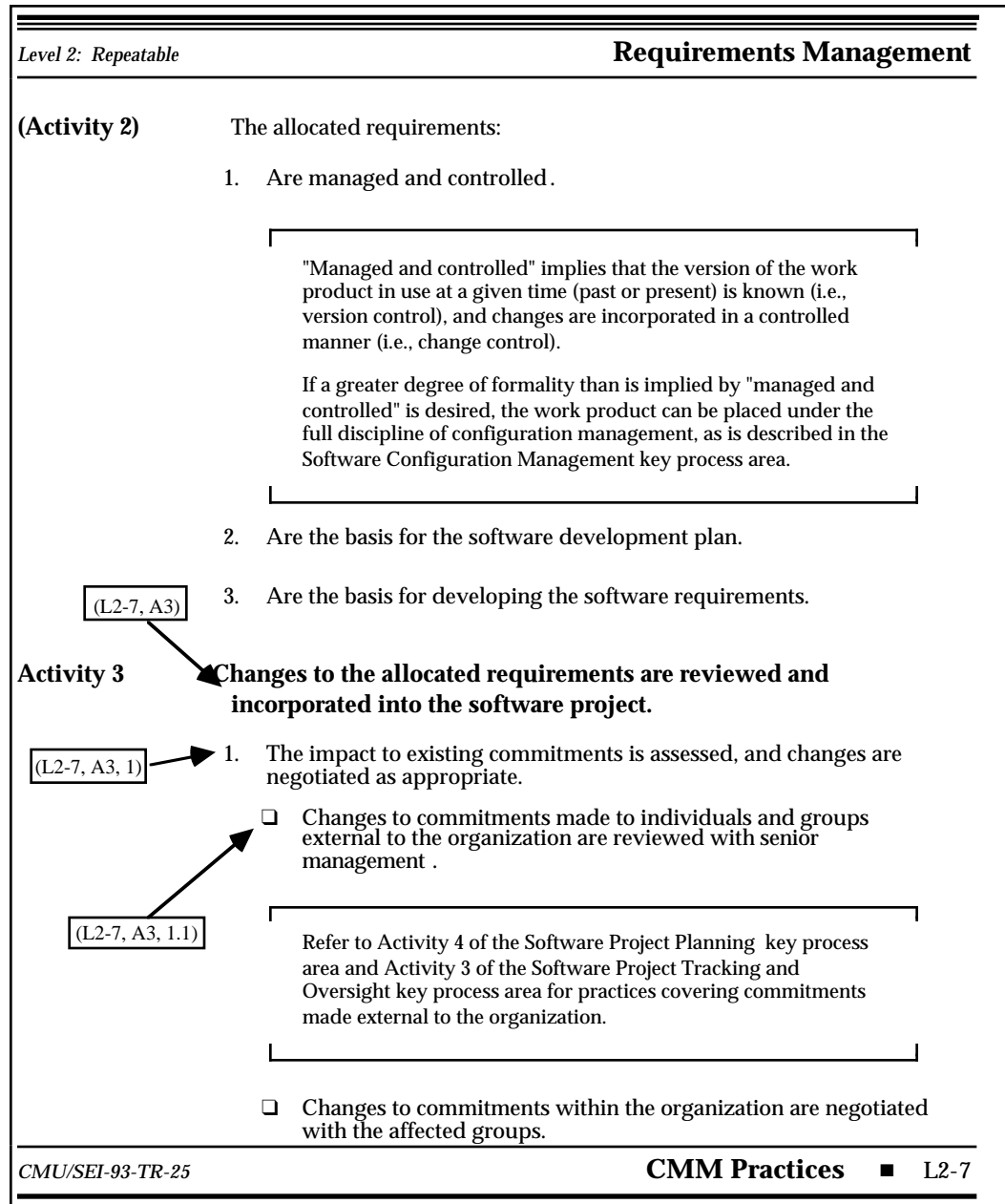
**Example:** The organization's activities for defect prevention are reviewed with **senior management** on a periodic basis. (L5-14, V1)

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# CMM Reference Text, Continued

**Example:  
CMM page  
with SPF  
references**

The following diagram shows a page from the CMM. Examples of CMM reference text are shown as boxed examples.



## CMM Reference Text, Continued

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**Abbreviations:** The abbreviations used for the key practice component of the CMM reference text  
**Key practices** are listed in the table below.

<b>CMM Common Features (key practice type)</b>	<b>Abbreviation</b>
Goal (not a common feature, but added as an SPF abbreviation)	G
Commitment to perform	C
Ability to perform	Ab
Activity performed	A
Measurement and analysis	M
Verifying implementation	V

**Note:** These abbreviations are always followed by a number denoting the number associated with the key practice.

**Example:** Activity 3 of Requirements Management is found on page L2-7, so the CMM Reference text would be (L2-7, A3).

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# CMM Reference Text

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**Introduction** The ability to trace from process documentation to the CMM is essential for software organizations. This section describes the convention used to cross-reference information items of the SPF to the CMM source documentation.

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**Definition** *CMM reference text* identifies the location of the CMM source material from which the SPF derives its information.

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**Expected use** CMM reference text is used to:

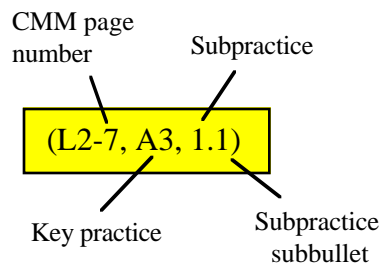
- Identify a passage in the CMM quickly.
- Maintain traceability from organizational process documentation to the CMM.

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**Syntax** The syntax of CMM reference text is:  
([CMM page], [Key practice], [Subpractice].[Subpractice subbullet])

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**Example:  
CMM reference  
text** This is an example of CMM reference text.



**Note:** Text which spans page boundaries of the CMM is referenced by the *first* page only.

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# CMM Context

**Introduction** There are many places where extracting a passage from the CMM results in lost context. This section describes how CMM-specific context within the SPF is provided.

**Indicating added context** Parentheses are used to provide CMM-specific context within the SPF.

**Example** The following example from the intergroup coordination key process area shows the use of parentheses to maintain context:

**IC Process - Inputs**

**Inputs** The table below lists the recommended inputs to the intergroup coordination process.

√	Input	Org. Input	References
	Actual completion (of critical dependencies). (L3-89, A4, 5.1)		
	Changes to intergroup commitments. (L3 - 88, A3, 4)		
	Changes to the plan (used to communicate intergroup commitments and to coordinate and track the work performed). (L3-88, A3, 5)		
	Changes to the project-level objectives. (L3-87, A2, 1.2)		
	Changes to the system requirements. (L3 - 87, A2, 1.2)		
	Commitments. (L3-90, A7, 4)		
	Customer's requirements. (L3-87, A1, 1)		
	End users requirements. (L3-87, A1, 1)		
	Intergroup commitments. (L3-88, A3)		
	Plan (used to communicate intergroup commitments and to coordinate and track the work performed). (L3-88, A3)		
	Project schedule. (L3-89, A4, 3)		
	Projected completion (of critical dependencies). (L3-89, A4, 5.1)		
	Software schedule. (L3-89, A4, 3)		
	Status (of critical dependencies). (L3-89, A4, 5.1)		
	System requirements. (L3-90, A7, 3)		
	Technical issues. (L3-90, A7, 5)		
	Technical requirements. (L3-90, A7, 3)		
	Technical risks. (L3-88, A2, 1.4)		

Context added

## Checklists, Continued

### Use

A checklist is used to:

- allow process designers, analyzers, or reviewers to check whether their software processes are consistent with the CMM.
- indicate that a particular item is being addressed by the organization.

### Example of use

The following example illustrates how the SPF checklists are used to show consistency with the CMM, and illustrate compliance and noncompliance with specific CMM recommendations. As shown in the example below, a check (√) in the left column is used to indicate that a role has been completely satisfied.

The checkboxes “☐” are used when there are checklists within checklists (nested checklists). When there are nested checklists, the left column becomes the parent checklist. Only check the parent checklist if all the checkboxes in that parent are satisfied.

In the example below, the SCCB role is not satisfied (the parent checklist is not checked) because all of the checkboxes within that parent have not been checked. Only the project manager role has been completely satisfied (indicated by the check in the left column).

√	Role	Activity	Reference
√	<b>Project Manager</b>	The SCM activities are reviewed with the <b>project manager</b> on both a periodic and event-driven basis. (L2-83, V2)	<i>VI S5.2</i>
	<b>SCCB</b>	The <b>SCCB</b> : (L2-73, Ab1) <ul style="list-style-type: none"> <li><input type="checkbox"/> Authorizes the establishment of software baselines and the identification of configuration items/units.</li> <li><input checked="" type="checkbox"/> Represents the interests of the project manager and all groups who may be affected by changes to the software baselines.</li> <li><input checked="" type="checkbox"/> Reviews and authorizes changes to the software baselines.</li> <li><input type="checkbox"/> Authorizes the creation of products from the software baseline library.</li> </ul>	<i>VI S4.6.2</i>  <i>VI S4.6</i>  <i>VI S4.6.2a</i>  <i>VI S4.6.2.b</i>

# Checklists

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## Introduction

The SPF presents information in checklists, which provide various perspectives of the recommendations made by the CMM. Organizations can use these checklists to compare their process documentation to the CMM.

The purpose of this section is to describe how the checklists in the SPF can be used.

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## Types of checklists

There are five types of checklists in the SPF. Their names and descriptions are provided below.

Checklist Type	Description
Policy	Describes the policy contents and KPA goals recommended by the CMM.
Standard	Describes the recommended content of select work products described in the CMM.
Process	Describes the process information content recommended by the CMM. The process checklists are further refined into checklists for: <ul style="list-style-type: none"><li>• roles,</li><li>• entry criteria,</li><li>• inputs,</li><li>• activities,</li><li>• outputs,</li><li>• exit criteria,</li><li>• reviews and audits,</li><li>• work products managed and controlled,</li><li>• measurements,</li><li>• documented procedures,</li><li>• training, and</li><li>• tools.</li></ul>
Procedure	Describes the recommended content of documented procedures described in the CMM.
Level Overview	Provides an overview of an entire maturity level. The level overview checklists are further refined into checklists for: <ul style="list-style-type: none"><li>• KPA purposes,</li><li>• KPA goals,</li><li>• policies,</li><li>• standards,</li><li>• process descriptions,</li><li>• procedures,</li><li>• training,</li><li>• tools,</li><li>• reviews and audits,</li><li>• work products managed and controlled, and</li><li>• measurements.</li></ul>

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# Chapter 2. Features of the Software Process Framework

## Overview

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**Chapter purpose**

The purpose of this chapter is to describe the features of the Software Process Framework (SPF).

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**In this chapter**

This chapter discusses the following features:

<b>Feature</b>	<b>See Page</b>
Checklists	Features-2
CMM context	Features-4
CMM reference text	Features-5
CMM role identification	Features-8
Entry and exit criteria	Features-9
Translation tables	Features-11
User references	Features-15

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