

GUIDE TO SOFTWARE ENGINEERING STANDARDS AND SPECIFICATIONS

PART II

SOFTWARE DEVELOPMENT SUPPORTING PROCESS STANDARDS

(Configuration Management, Documentation, Project Management, Quality Assurance, and Verification and Validation Standards)

GUIDE TO SOFTWARE ENGINEERING STANDARDS AND SPECIFICATIONS

PART II

SOFTWARE DEVELOPMENT SUPPORTING PROCESS STANDARDS

(Configuration Management, Documentation, Project Management, Quality Assurance, and Verification and Validation Standards)

Authors: STAN MAGEE, CCP
and
LEONARD L. TRIPP

©Software Engineering Process Technology (SEPT), and Artech House Publishers. All Rights Reserved

CONTENTS

Preface	3
Introduction	5
Standards Developing Organizations	8
Software Engineering Standards and Specifications	19
Subject Index	178

PREFACE

There are over 1.5 million people worldwide engaged in the software engineering profession, and the number is growing each day. These engineers are involved with product lines that range from children's games to high safety-critical software systems in the medical, nuclear, military, and transportation sectors. A key element in producing high-quality software at a reasonable cost is a set of best practices of the profession. To meet this need, various industrial and professional standards-making bodies have produced standards, guides, or other specifications to define the "best of practice" for producing software. Typically, these standards are targeted at the expressed needs of an organization's constituents.

The software engineering process standards field is an unregulated and uncoordinated field with many organizations producing sector related standards. There are less than 1000 people worldwide who are actively involved in the development of these standards; most are volunteers who are experts in their respective fields within the vast arena of software engineering. They represent 55 organizations that have produced or are producing software engineering standards. Some of these organizations, such as the International Organization for Standardization (ISO), are very large, operate at the international level, and exert a powerful influence on the software engineering standards world. Others, like the U.S. National Information Standards Organization (NISO) are small, sector-specific, and have little influence.

These organizations have produced over 300 documents in this field, each with a different perspective or addressing a specific niche relative to the software process arena. The amount of overlapping and duplicated information in these standards is significant. Software engineering process is like any other engineering process-driven field—the basic elements are the same. These elements are: *requirements definition, design, fabrication, installation, operation and maintenance, and retirement*. Since the special cases for producing and maintaining software are varied, these are some of the factors that have caused duplication of standards data.

It is becoming more and more difficult for software engineering professionals to be aware of and to access all of the knowledge published on the best of practice in the software field. A directory was clearly needed. Hence, the first edition of a book was published in 1994 and contained abstracts of 220 software engineering standards and related specifications. A second edition was published in 1997 that contains 315 standards.

Our customers have frequently requested the ability to access this book on-line. Now, due to new Web technology, it is available on-line. To further reduce cost and simplify the downloading process, the book has been subdivided into three parts. Part I addresses all standards that apply to software development and maintenance, such as requirement definition, integration, etc. Part II contains those standards that address the software development supporting processes such as configuration management and documentation. Part III addresses software engineering tools and technique standards such as metrics, and reliability. The hardcopy version of the entire book, *Guide To Software Engineering Standards and Specifications*, Artech House Publishers, 1997, ISBN 0-89006-919-0 may be purchased from any major on-line bookstore.

Part II contains the development standards for software supporting processes. These are *configuration management, documentation, project management, quality assurance, and verification and validation*. Included are 157 of these documents. Many of the standards listed encompass more than one software engineering process, and are therefore “multidisciplinary”. The index does not differentiate between those standards that are “stand alone” versus those that may be considered “multidisciplinary”.

The purpose of this volume is to assist the reader by providing a clear, concise, and organized way to access the standards information pertaining to software development supporting processes.

Part II provides:

- A directory of software engineering standards and specifications for software development supporting processes.
- A listing of standards by a particular sub-field (i.e., configuration management, documentation, project management, quality assurance, and verification and validation).
- An overview of each standard that will assist the software engineer and organization to select the right document to meet their software development supporting process needs.

INTRODUCTION

PURPOSE AND SCOPE

Part II of this book contains abstracts and relevant information on 157 standards, guides, and technical reports related to software engineering supporting processes. It provides a carefully researched source of data on existing software engineering standards and includes an abstract of the standard document, its field of application, and how to obtain copies. The authors have carefully reviewed each of these documents.

The information has been presented in a manner that allows the reader to determine which software engineering standards are most appropriate for his or her needs.

Part II contains only those standards and specifications that pertain to software engineering supporting processes, may be obtained from a commercial source, and are written in the English language.

The publisher and authors welcome comments on improving this volume.

LAYOUT

Part II contains two sections and an index. The first section contains a list of standards-developing organizations. Section two contains a page of information for each of the 157 standards and/or specifications contained in the volume. The index of this book is designed to allow the reader to quickly access a standard that is pertinent to a specific software supporting process.

CONTENTS

Each abstract page contains one standard, guide, handbook, or technical report. Included on the page is the formal title of the standard, an icon that describes the standard's classification, issuing year of the standard, length of standard in pages, scope and field of application, the issuing organization, and where the standard may be purchased in the United States.

The acronym that appears in the upper left hand of each standards page is the accepted abbreviation of the originating organization. The full name of the organization may be found in the listing of standards-making organizations located in the first section of Part II of the book. The number of the standard or guide displayed is the number assigned by the originating organization. If the number contained the year of release, it was not included. This information is provided in the section of each page that follows the icon.

The originating committee name for the standard is the current name of the committee. Some organizations have changed names since the first edition of this book.

In this volume, the term *standard* implies that the document contains a set of mandatory requirements and a method to determine compliance. The term *guide* implies the document gives a suggested set of requirements and a formal method to determine compliance or gives suggestions for implementing a standard. The terms *handbooks*, and *technical reports*, denote documents containing in-depth information on a software-engineering sub-field. In some instances, through ongoing use and acceptance, some guides, handbooks, and technical reports have become de-facto standards.

ICON

The standards are categorized in three classifications. The first classification is by the type of process that is the major focus of the standard. The processes identified are: **acquisition, requirements definition, design, code and test, integration, maintenance & operation, configuration management, documentation, project management, quality assurance, and verification & validation**. The second classification is the type of technique or tools to which the standard applies. These include: **CASE tools, languages & notations, metrics, privacy, process improvement, reliability, safety, security, software reuse, vocabulary and “other”**. The third classification refers to sector applicability. These sectors are: **all sectors, defense, financial, medical, nuclear, process control, scientific, shrink-wrap, and transportation**. If the standard is applicable to all sectors, the classification “**all sectors**” is denoted.

The icons (standards) found in this volume will always pertain to **configuration management, documentation, project management, quality assurance, and verification and validation**. Following is a sample icon:

PROCESS	TECHNIQUE—TOOLS	APPLICABILITY
Acquisition	CASE Tools	All Sectors
Requirements Definition	Languages & Notations	Defense
Design	Metrics	Financial
Code & Test	Privacy	Medical
Integration	Process Improvement	Nuclear
Maintenance & Operations	Reliability	Process Control
Configuration Management	Safety	Scientific
Documentation	Security	Shrink-wrap
Project Management	Software Reuse	Transportation
Quality Assurance	Vocabulary	
Verification & Validation	Other	

OBTAINING THESE STANDARDS:

The standards listed in this book may be purchased from the cited organizations or from Techstreet, 1327 Jones Drive, Ann Arbor, MI. 48105 USA. Telephone: (800) 699-9277. For orders outside the USA and Canada, call (734) 302-7801. Fax: (734) 302-7811. Internet: <http://www.techstreet.com>.

SECTION I

STANDARDS DEVELOPING ORGANIZATIONS

AECL

Atomic Energy of Canada Limited
C/O Ontario Hydro H12 D27
700 University Ave.
Toronto, Ontario
Canada M5G 1X6
Tel: +1-416-592-7235

AIAA

American Institute of Aeronautics and Astronautics
1801 Alexander Bell Drive
Reston, VA 20191
Tel: 1-703-264-7500
FAX: 1-703-264-7551
WWW: <http://www.aiaa.org>

ANS

American Nuclear Society
555 North Kensington Avenue
La Grange Park, IL 60525
Tel: 1-708-352-6611
WWW: <http://www.ans.org>

ANSI

American National Standards Institute
11 W. 42nd Street, 13th Floor
New York., NY 10036
Tel: 1-212-642-4900
FAX: 1-212-398-0023
e-mail: info@ansi.org
WWW: <http://www.ansi.org>

APWA

American Public Works Association
1313 E. 60th Street
Chicago, IL 60637
Tel: 1-816-472-6100

ARINC

Aeronautical Radio Research, Inc.
2551 Riva Road
Annapolis, MD 21401
Tel: 1-410-266-4000
FAX: 1-410-266-4040

AS

Standards Australia
1 The Crescent,
Homebush, NSW 2135
Australia
Tel: +61-2-9746-4700
FAX: +61-2-9746-8450
e-mail: sic@saa.aa.telememo.au

ASME

American Society of Mechanical Engineers
345 East 47th Street
New York, NY 10017
Tel: 1-212-705-7722
FAX: 1-201-882-1717
e-mail: infocentral@asme.org
WWW: <http://www.asme.org>

ASTM

American Society for Testing and Materials
100 Bar Harbor Drive
West Conshohocken, PA 19428-2959
Tel: 1-610-832-9500
FAX: 1-610-832-9555
e-mail: service@local.astm.org

ATA

Air Transport Association of America
1709 New York Ave. NW
Washington, DC 20006-5206
Tel: 1-202-626-4000, or 1-301-490-7951
Distribution Center
PO Box 511
Annapolis Junction, MD 20701
Tel: 1-800-497-3326
FAX: 301-206-9789