IEEE Std 1558™-2004

IEEE Standards

1558™

IEEE Standard for Software Documentation for Rail Equipment and Systems

IEEE Vehicular Technology Society

Sponsored by the
Rail Transit Vehicle Interface Standards Committee

IEEE

3 Park Avenue, New York, NY 10016-5997, USA

23 March 2005

Print: SH95279
PDF: SS95279

Recognized as an
American National Standard (ANSI)

IEEE Std 1558™-2004

IEEE Standard for Software Documentation for Rail Equipment and Systems

Sponsored by

Rail Transit Vehicle Interface Standards Committee
of the
IEEE Vehicular Technology Society

Approved 2 February 2005

American National Standards Institute

Approved 23 September 2004

IEEE-SA Standards Board

Abstract: This standard provides an outline for the software documentation that shall be developed and delivered for rail equipment and systems.
Keywords: deliverables, outlines, rail equipment, rail systems, software documentation

---

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

Print: ISBN 0-7381-4494-0 SH95279
PDF: ISBN 0-7381-4495-9 SS95279

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board. The IEEE develops its standards through a consensus development process, approved by the American National Standards Institute, which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and serve without compensation. While the IEEE administers the process and establishes rules to promote fairness in the consensus development process, the IEEE does not independently evaluate, test, or verify the accuracy of any of the information contained in its standards.

Use of an IEEE Standard is wholly voluntary. The IEEE disclaims liability for any personal injury, property or other damage, of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, or reliance upon this, or any other IEEE Standard document.

The IEEE does not warrant or represent the accuracy or content of the material contained herein, and expressly disclaims any express or implied warranty, including any implied warranty of merchantability or fitness for a specific purpose, or that the use of the material contained herein is free from patent infringement. IEEE Standards documents are supplied "**AS IS**."

The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE Standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard. Every IEEE Standard is subjected to review at least every five years for revision or reaffirmation. When a document is more than five years old and has not been reaffirmed, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE Standard.

In publishing and making this document available, the IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity. Nor is the IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing this, and any other IEEE Standards document, should rely upon the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

Interpretations: Occasionally questions may arise regarding the meaning of portions of standards as they relate to specific applications. When the need for interpretations is brought to the attention of IEEE, the Institute will initiate action to prepare appropriate responses. Since IEEE Standards represent a consensus of concerned interests, it is important to ensure that any interpretation has also received the concurrence of a balance of interests. For this reason, IEEE and the members of its societies and Standards Coordinating Committees are not able to provide an instant response to interpretation requests except in those cases where the matter has previously received formal consideration. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position, explanation, or interpretation of the IEEE.

Comments for revision of IEEE Standards are welcome from any interested party, regardless of membership affiliation with IEEE. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments. Comments on standards and requests for interpretations should be addressed to:

Secretary, IEEE-SA Standards Board

445 Hoes Lane

Piscataway, NJ 08855-1331USA

NOTE—Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken with respect to the existence or validity of any patent rights in connection therewith. The IEEE shall not be responsible for identifying patents for which a license may be required by an IEEE standard or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention.

Introduction

This introduction is not part of IEEE Std 1558-2004, IEEE Standard for Software Documentation for Rail Equipment and Systems.

Software is used in many facets of the rail transit industry, including real-time software control of electronics on rail vehicles, wayside control, and centralized operations control centers. Over time, the number, complexity, and interconnectivity of these systems have increased, while expectations for trouble-free operation have increased. Systems in this industry require the interaction of many software-based subsystems often provided by multiple suppliers.

Documentation, developed and contractually required for software-based subsystems, has evolved as well. Variation in the interpretation of the existing IEEE software standards has occurred within the rail transit industry. Although similarities in software documentation exist, both from project-to-project and from supplier-to-supplier, the differences lead to lack of commonality and increased review time by the acquirer. Also, the application of the existing IEEE standards within the rail transit industry has led to redundancy of information in the resulting documents. Redundant information has led to inconsistency and ambiguity.

This standard is intended to reduce the variation in the interpretation of the referenced software standards. In addition, this standard minimizes the duplication of information in the resulting set of documents as would result if each IEEE standard was implemented in its entirety.

This documentation standard establishes a uniform set of documents, consistent terminology, and a uniform interpretation of the underlying referenced software standards. Use of this standard will provide acquirers and suppliers with a consistent document set as well as a consistent set of contents.

This standard places requirements on the software development process. However, this standard neither defines a software development practice (particularly as it relates to safety critical software or a software development life cycle) nor does it require a particular design methodology or programming language.

Notice to users

Errata

Errata, if any, for this and all other standards can be accessed at the following URL: http://standards.ieee.org/reading/ieee/updates/errata/index.html. Users are encouraged to check this URL for errata periodically.

Interpretations

Current interpretations can be accessed at the following URL: http://standards.ieee.org/reading/ieee/interp/index.html.

Patents

Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken with respect to the existence or validity of any patent rights in connection therewith. The IEEE shall not be responsible for identifying patents or patent applications for which a license may be required to implement an IEEE standard or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention.

Participants

The following is a list of participants in the the Software Documentation for Rail Equipment and Systems Working Group.

Paul E. Jamieson, *Chair*

Linda Sue Boehmer
Vincent J. Cavataio
Lori J. Colangelo
John H. Corvin
Denise Edgecomb-Cope
Byron Frank
William R. MacArthur
Bonnie McDonough
Shantilal Morar
Francois Ouellette
Marilyn M. Phillips
Charles Pleckaitis
Thomas Tougas

The following members of the individual balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

Robert Anderson
Karl W. Berger
Linda Sue Boehmer
Robert J. DiSilvestro
Jim Dietz
Claude Gabriel
Harold C. Gillen
Harvey Glickenstein
James R. Hoelscher
Paul E. Jamieson
Kevin D. Johnson
Don Kane
Werner Katerkamp
Walter R. Keevil
John LaForce
David A. Male
Thomas J. McGean
John McGregor
Kamel Mokhtech
Howard Moody
Edwin A. Mortlock
Patrick Murphy
Robert D. Pascoe
William Petit
David R. Phelps
Venkat Rao Pindiprolu
Alan F. Rumsey
Louis Sanders
Alexander Sinyak
Thomas J.Sullivan
Arun Virginkar

When the IEEE-SA Standards Board approved this standard on 23 September 2004, it had the following membership:

Don Wright, *Chair*

Steve M. Mills, *Vice Chair*

Judith Gorman, *Secretary*

Chuck Adams
H. Stephen Berger
Mark D. Bowman
Joseph A. Bruder
Bob Davis
Roberto de Marca Boisson
Julian Forster*
Arnold M. Greenspan
Mark S. Halpin
Raymond Hapeman
Richard J. Holleman
Richard H. Hulett
Lowell G. Johnson
Joseph L. Koepfinger*
Hermann Koch
Thomas J. McGean
Daleep C. Mohla
Paul Nikolich
T. W. Olsen
Ronald C. Petersen
Gary S. Robinson
Frank Stone
Malcolm V. Thaden
Doug Topping
Joe D. Watson

*Member Emeritus

Also included are the following nonvoting IEEE-SA Standards Board liaisons:

Satish K. Aggarwal, *NRC Representative*
Richard DeBlasio, *DOE Representative*
Alan Cookson, *NIST Representative*

Don Messina
IEEE Standards Project Editor

Contents

IEEE Standard for Software Documentation for Rail Equipment and Systems

1. Overview

1.1 Scope

This standard establishes the minimum requirements for application software documentation throughout the software development life cycle for rail equipment and systems including associated test and maintenance equipment.

1.2 Purpose

Many differing requirements for application software documentation are presently being specified for software used in rail equipment and systems and for related applications, which has led to a lack of standardization in the information provided on equipment and systems incorporating software. This standard, when used by the authority having jurisdiction, car builders, and system/subsystem suppliers, is intended to specify documents that improve the understanding of software functionality, facilitate software corrections and upgrades, improve on-time delivery, and lower software acquisition and maintenance costs.

1.3 Existing applications

Existing projects in progress before the effective date of this standard need not comply with the new or revised requirements of this edition, except where specifically required by the authority having jurisdiction.

2. References

This standard shall be used in conjunction with the following publications.

EIA/IEEE J-STD-016-1995, Trial-Use Standard for Information Technology Software Life Cycle Process Software Development Acquirer-Supplier Agreement (withdrawn).[1]

[1]EIA/TIA publications are available from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112, USA (http://global.ihs.com/).

IEEE Std 610.12™-1990, IEEE Standard Glossary of Software Engineering Terminology.[2, 3]

IEEE Std 730™-2002, IEEE Standard for Software Quality Assurance Plans.

IEEE Std 828™-1998, IEEE Standard for Software Configuration Management Plans.

IEEE Std 829™-1998, IEEE Standard for Software Test Documentation.

IEEE Std 830™-2002, IEEE Recommended Practice for Software Requirements Specifications.

IEEE Std 1012™-1998, IEEE Standard for Software Verification and Validation.

IEEE Std 1016™-1998, IEEE Recommended Practice for Software Design Descriptions.

IEEE Std 1058™-1998, IEEE Standard for Software Project Management Plans.

IEEE/EIA Std 12207.0™-1996, IEEE/EIA Standard Industry Implementation of International Standard ISO/IEC 12207: 1995 (ISO/IEC 12207), Standard for Information Technology-Software Life Cycle Processes.

IEEE/EIA Std 12207.1™-1997, Industry Implementation of International Standard ISO/IEC 12207: 1995. (ISO/IEC 12207), Standard for Information Technology-Software Life Cycle Processes-Life Cycle Data.

3. Definitions, acronyms, and abbreviations

3.1 Definitions

For the purposes of this standard, the following terms and definitions apply. *The Authoritative Dictionary of IEEE Standards Terms* [B1] and IEEE Std 610.12-1990 should be referenced for terms not defined in this clause.[4, 5]

3.1.1 software integrity level: A denotation of a range of values of a property of an item necessary to maintain system risks within acceptable limits. For items that perform mitigating functions, the property is the reliability with which the item must perform the mitigating function. For items whose failure can lead to a threat, the property is the limit on the frequency of that failure.

[2]IEEE publications are available from the Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, Piscataway, NJ 08854, USA (http://standards.ieee.org/).

[3]The IEEE standards or products referred to in this clause are trademarks of the Institute of Electrical and Electronics Engineers, Inc.

[4]The numbers in brackets correspond to those of the bibliography in Annex B.

[5]Information on references can be found in Clause 2.

3.2 Acronyms and abbreviations

DBDD	database design description
DBMS	database management system
EIA	Electronic Industries Association
ICD	interface control document
IEEE	Institute of Electrical and Electronics Engineers, Inc.
SCI(s)	software configuration item(s)
SCM	software configuration management
SCMP	software configuration management plan
SDD	software design description
SPMP	software project management plan
SQA	software quality assurance
SQAP	software quality assurance plan
SRS	software requirements specification
SRTM	software requirements traceability matrix
STP	software test plan
STPr	software test procedure
STR	software test report
SUM	software users manual
SVD	software version description
SVVP	software verification and validation plan
SVVR	software verification and validation report
V&V	verification and validation

4. General requirements

During the course of a software project, a process (sequence of steps/activities) is followed to provide software. The activities result in artifacts/work products (e.g., documents). It is assumed that a software engineering process is in place and that the system/subsystem supplier produces a comprehensive set of documents during the course of a software project. The comprehensive set of documents is independent of a specific life cycle.

The acquirer shall specify a procurement type that identifies the documentation set for delivery to the acquirer (See 4.2).[6] The documentation set established for each procurement type is a subset of the comprehensive set of documents. Deviations from the established procurement types or modifications to the comprehensive set of documents shall be agreed on between the acquirer and the supplier. It is highly recommended that the agreement be reached before contract award. The documentation set for delivery on the software project shall be planned in accordance with this standard, taking into account any agreed on deviations, and documented in the SPMP of the project.

4.1 Software documentation overview

Figure 1 depicts the context of the software documentation within the system development activities. The activities used in the figure are consistent with IEEE/EIA Std 12207.0-1997. It is not the intent of this standard to imply a specific life cycle. The white boxes illustrate the necessary software project activities and the associated documents required by this standard. The shaded boxes illustrate important activities that are necessary but are not within the scope of this standard.

[6]In the rail transit industry, the acquirer may include any or all levels of procurement, including the following: the authority having jurisdiction, the car builder, and the system/subsystem supplier(s).

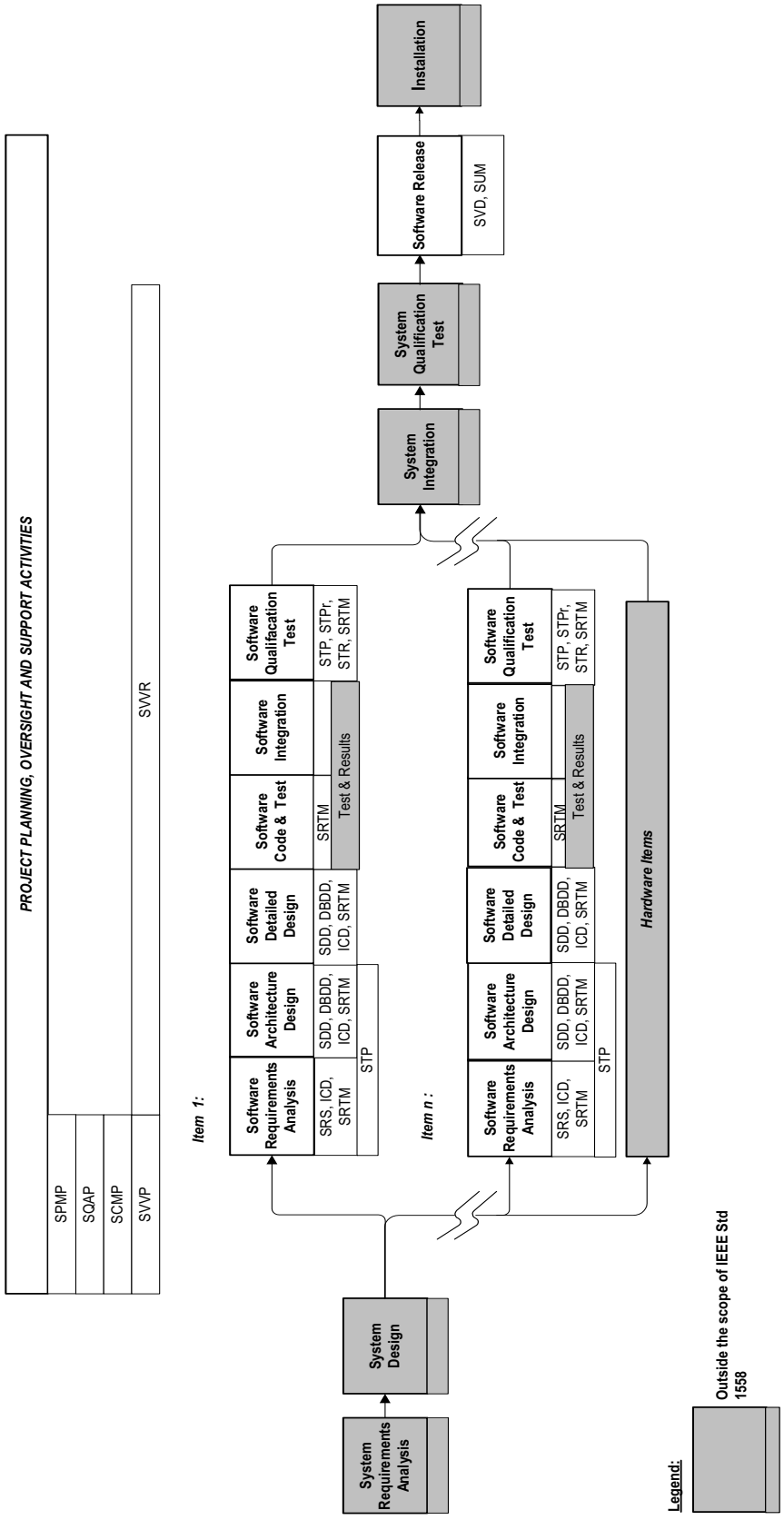

Figure 1—Software development activities

This standard places requirements on the software development process. However, this standard neither defines a software development practice (particularly as it relates to safety critical software, a software development life cycle) nor does it require a particular design methodology or programming language.

NOTE—The software project scope may include one or more items. These items can be further decomposed into one or more software configuration items. It is not the intent of this standard to imply a one-to-one correlation between the number of items supplied and the number of documents produced. Each document can pertain to a single software configuration item or an aggregate of associated software configuration items.[7]

4.2 Deliverables section

Table 1 defines five procurement types and the documents that shall be delivered with each type. An "X" indicates the documents delivered for each type.

Table 1—Deliverables

Document	Abbreviation	Type 1	Type 2	Type 3	Type 4	Type 5
Software project management plan	SPMP		x	x	x	x
Software quality assurance plan	SQAP				x	x
Software configuration management plan	SCMP				x	x
Software verification and validation plan	SVVP				x	x
Software verification and validation report	SVVR				x	x
Software requirements specification	SRS			x	x	x
Interface control document	ICD			x	x	x
Software design description	SDD					x
Database design description	DBDD					x
Software requirements traceability matrix	SRTM			x	x	x
Software test plan	STP				x	x
Software test procedure	STPr				x	x
Software test report	STR			x	x	x
Software version description	SVD	x	x	x	x	x
Software user manual	SUM	x	x	x	x	x

The acquirer shall select a procurement type. In the selection of a procurement type, there is a tradeoff between an increased acquirer's level of involvement and mitigation of risk.

— Type 1: Provides documentation regarding the installation and use of the software.

[7]Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the guide.

— Type 2: Provides documentation regarding software project management and installation and use of the software.

— Type 3: Provides documentation regarding software project management, the software functional requirements/interfaces, software testing results, and installation and use of the software.

— Type 4: Provides documentation regarding all aspects of software project management, the software functional requirements/interfaces, the planning and execution of software testing, software testing results, verification and additional validation of the requirements, and installation and use of the software.

— Type 5: Provides documentation regarding all aspects of software project management, the software functional requirements/interfaces, the detailed software design, the planning and execution of software testing, software testing results, verification and additional validation of the requirements, and installation and use of the software.

5. Document outlines

The user shall apply the direction contained in the referenced IEEE standards, except as customized by this standard.

5.1 SPMP

The SPMP shall define the software project roles and responsibilities, activities, and work products including those to be delivered. The SPMP shall describe the applicable processes and procedures methods, standards, and practices. The SPMP shall be applicable to various types of software projects including new development, modification, reuse, reengineering, maintenance, and all other activities resulting in software products. The SPMP shall conform to IEEE Std 1058-1998 as customized in Table A.1.

5.2 SQAP

The SQAP shall define the software project roles and responsibilities, activities, and work products applicable to software quality assurance. The SQAP shall specify the applicable processes and procedures that are used. The SQAP shall conform to IEEE Std 730-2002 as customized in Table A.2.

5.3 SCMP

The SCMP shall define software project roles and responsibilities, activities, and work products applicable to software configuration management. The SCMP shall identify the software configuration items to which software configuration management shall be applied. The SCMP shall describe the relationship of software configuration management to other configuration management activities. The SCMP shall conform to IEEE Std 828-1998 as customized in Table A.3.

5.4 SVVP

The SVVP shall define the software project roles and responsibilities, activities, and work products applicable to software verification and validation (V&V). The SVVP shall specify the applicable processes and procedures that are used. The SVVP shall conform to IEEE Std 1012-1998 as customized in Table A.4.

5.5 SVVR

The SVVR shall be a compilation of the results of the V&V activities, as planned in the SVVP. The SVVR shall conform to IEEE Std 1012-1998 as customized in Table A.5.

5.6 SRS

The SRS shall document the software requirements such that each can be objectively verified and validated by a prescribed method. The SRS shall also document the assumptions and design constraints imposed on the software implementation. The SRS shall conform to IEEE Std 830-1998 as customized in Table A.6.

NOTE—The software requirements description specified in IEEE Std 830-2002 is equivalent to the SRS.

5.7 SDD

The SDD shall define and record software design decisions, such as behavioral design and other decisions affecting the selection and design of software components. The SDD shall describe the software architectural design, provide the acquirer visibility into the design, and provide information needed for software maintenance. The SDD shall conform to IEEE Std 1016-1998 as customized in Table A.7.

5.8 ICD

The ICD shall clearly and precisely describe all essential software requirements associated with each interface such that they can be objectively verified and validated by a prescribed method. The ICD specifies the requirements imposed on one or more systems, subsystems, hardware, software, manual operations, or other system components to achieve one or more interfaces among these entities. The ICD addresses interfaces between two or more SCIs within the same subsystem, and/or between subsystems. Interfaces can either be internal between SCIs or between an SCI and its external environment (e.g., User, Hardware, Software, Communication, Other). The ICD shall be as described in Table A.8.

5.9 DBDD

The DBDD shall describe the design of the database, that is, a collection of related data stored in one or more computerized files in a manner that can be accessed by users or computer programs via a DBMS. The DBDD shall also describe the software units used to access or manipulate the data. The DBDD is used as the basis for implementing the database and related software units. The DBDD provides the acquirer visibility into the design and provides information needed for software maintenance. The DBDD shall conform to EIA/IEEE J-STD-016-1995 Annex G.2.3 and/or IEEE 1016-1998 as customized in Table A.9.

This document shall only be required when one or more database(s) are used within the software.

5.10 SRTM

The SRTM shall be used to trace software requirements backward to the source document(s) and forward to the software design and software test documents. The SRTM shall map all software requirements identified in the SRS in the following manner:

— Backward to the source documents, (e.g. system requirements and system design documentation)

— Forward to the SDD, ICD, DBDD, STPr, and STR

During the software requirements analysis activity, the supplier shall enter each software requirement into the SRTM and shall map the software requirements to the appropriate section(s) of the SRS with a unique identifier.

The SRTM shall be as described in Table A.10.

5.11 STP

The STP shall provide a listing of the qualification testing to be performed on the SCI(s). The STP enables the acquirer to assess if the testing is adequate for the SCI(s). The STP shall conform to IEEE Std 829-1998 as customized in Table A.11.

5.12 STPr

The STPr shall provide the customized procedures used in qualification testing on the SCIs. The STPr enables the acquirer to assess the procedures used. The STPr shall conform to IEEE Std 829-1998 as customized in Table A.12.

5.13 STR

The STR shall provide a record of the qualification testing performed on the SCIs. The STR enables the acquirer to assess the testing and its results. The STR shall conform to IEEE STD 829-1998 as customized in Table A.13.

5.14 SVD

The SVD shall identify and describe a software version consisting of one or more SCI(s). The SVD shall be used to release, track, and control software versions. The term “version” may be applied to the initial release of the software, to a subsequent release of that software, or to one of multiple forms of the software released at approximately the same time (for example, to different sites). The SVD shall conform to EIA/IEEE J-STD-016-1995 as customized in Table A.14.

5.15 SUM

The SUM describes how to install and use SCI(s), a group of related SCIs, or a software system or subsystem. The SUM may also cover a particular aspect of software operation, such as instructions for a particular position or task. The SUM is developed for software that is run by the user and has a user interface requiring on-line user input or interpretation of displayed output. If the software is embedded in a hardware-software system, user manuals or operating procedures for that system may make separate SUMs unnecessary, i.e., may be integrated in system level maintenance and operations manual. The SUM shall conform to EIA/IEEE J-STD-016-1995 as customized in Table A.15.

6. Document format

Documents not automatically generated by computer-assisted software engineering tools or models shall follow this format.

6.1 General requirements

All sheets shall include the document name, document number, document revision level, page number, and total number of pages.

6.2 Title page

The title page shall include the project name (if specific to a single project), document name with abbreviation, system name, supplier name, Contract Data Requirements List identifier (if applicable), the individuals involved, document number, revision level, revision date, status, and nondisclosure clause (if applicable).

The individuals involved shall include those responsible for the document preparation, review, and approval. The individual's name, title, and signature, and the date shall appear. Signatures shall not be required if an electronic release system approved by the acquirer is used.

The revision date and its format shall be specified in the document.

6.3 Revision sheet

The revision sheet shall appear in table format that includes revision number, revision date, and description of the change.

The change description shall reference the specific section(s) that was revised. The revision may include the reference to another document that was the change source.

If the revision history is maintained in a separate document such as an Engineering Change Order, the change order number shall appear in the revision description.

Each document revision shall include the names of the individuals that prepared, reviewed, and approved that release.

If edge marking is used for revision tracking, and revision explanation is not included in the document, all document revisions shall be maintained.

6.4 Table of contents

The table of contents shall include each major heading and page number.

If multiple subheadings appear under a major heading, each subheading and page number shall be listed.

Further subheadings may be included if the additions aid in locating information within the document.

Each appendix section shall be listed.

6.5 List of figures

If more than one figure is included in the document, the listing shall include the identification, description, and page number.

6.6 List of tables

If more than one table is included in the document, the listing shall include the identification, description, and page number.

6.7 Body

The body shall be divided into major headings and subheadings as required.

Subheadings shall only be used if more than one subheading is required.

Numbering conventions shall follow a numerical convention:

1.0
1.1
1.1.1
1.1.2
1.2
1.3

6.8 Appendix

The appendix shall incorporate a separate numbering convention where each appendix section is identified with an alphabetic character prefix. Example: A, B, C, and so on.

Headings and subheadings shall follow the requirements specified in the Body (see 6.7).

Each appendix shall use a unique page numbering system. Example: A1, B1, C1, and so on.

Annex A

(normative)

Document contents

Table A.1 through Table A.16 each has an identical structure. A description of the information contained in each column follows:

— Document Section: Section number of the document being prepared.

— Content List: Description of the section.

— Applicability: Mandatory, recommended, or not required

Mandatory: The information presented in this section shall be included in the document.

Recommended: The information may be omitted as agreed to between the acquirer and the supplier.

Not Required: The information was originally contained in the applicable IEEE referenced standard. The information may be located in another document or was determined not to be applicable to rail transit applications.

— Guidance: Guidance on applying this standard.

— Reference Standard Section: IEEE reference section number used to develop the outline.

— Changes to Reference Standard: Entries may be “Added,” “Modified,” “Omit,” or blank. Blank indicates the specification section is accepted as is. “Added,” “Modified,” or “Omit” indicates that information regarding the addition, modification, or omission of the specification section information is included in the Guidance column.

NOTES

1—When the term “section” appears in the “Guidance” column or the “Change to Reference Standard” column, it refers to the “Document Section” column of this document or another document in Annex A.

2—When the term “clause” appears in the “Guidance” column, it refers to a clause in this standard or a reference standard.

Table A.1—SPMP: Reference standard IEEE Std 1058-1998

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
1.0	Overview	Mandatory	Describe the general nature of the system and software; it will also summarize the history of system development, operation, and maintenance.	4.1	
1.1	Project summary	Mandatory		4.1.1	
1.1.1	Purpose, scope, and objectives	Mandatory	In addition, identify intended audience.	4.1.1.1	
1.1.1.1	Context diagram	Mandatory	Depict the overall system and shall identify system and elements covered by this plan. A system context diagram shows the interface between the system provided and the external environment with which it interacts.		Added
1.1.1.2	Functional elements	Mandatory	Identify and describe each of the SCI(s) developed and its associated software integrity level for performing V&V tasks.		Added
1.1.2	Assumptions and constraints	Mandatory		4.1.1.2	

Table A.1—SPMP: Reference standard IEEE Std 1058-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
1.1.3	Project work products	Mandatory	List all work products used/produced. The work product list may include work products not identified in this standard. It shall identify whether each work product is either deliverable or nondeliverable to the acquirer. The media used for delivery shall be identified.	4.1.1.3	This clause is renamed and expanded to include the identification of nondeliverable work products as well.
1.1.4	Schedule and budget summary	Mandatory Recommended	This plan may be incorporated directly or by citing a reference to other plans. The schedule summary shall also include delivery dates for the project deliverables. Dates may be defined as specific dates, or relative to contractual and/or business milestones. A budget summary may be provided.	4.1.1.4	Added delivery dates to deliverables defined in section. Budget information is recommended but not mandatory. The developer may delete this information, especially if the project has a fixed cost.
1.2	Evolution of the SPMP	Mandatory		4.1.2	
2.0	References	Mandatory	Complete list of all documents referenced within this document. Omit the last sentence of 4.2, which states that, "Any deviations from the referenced standards or policies shall be identified and justification shall be provided."	4.2	Deviations from referenced standards are described in the specific section making the reference.
3.0	Definitions	Mandatory		4.3	
4.0	Project organization	Mandatory		4.4	
4.1	External interfaces	Mandatory		4.4.1	
4.2	Internal structure	Mandatory		4.4.2	

Table A.1—SPMP: Reference standard IEEE Std 1058-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
4.3	Roles and responsibilities	Mandatory		4.4.3	
5.0	Managerial process plans	Mandatory	This plan may be incorporated directly or by citing a reference to other plans.	4.5	
5.1	Project startup plan	Recommended		4.5.1	
5.1.1	Estimation plan	Recommended	This plan may be incorporated directly or by citing a reference to other plans.	4.5.1.1	
5.1.2	Staffing plan	Recommended	This plan may be incorporated directly or by citing a reference to other plans.	4.5.1.2	
5.1.3	Resource acquisition plan	Recommended		4.5.1.3	
5.1.4	Project staff training plan	Recommended		4.5.1.4	
5.2	Work plan	Mandatory	This plan may be incorporated directly or by citing a reference to other plans.	4.5.2	
5.2.1	Work activities	Mandatory	This plan may be incorporated directly or by citing a reference to other plans or schedules.	4.5.2.1	
5.2.2	Schedule allocation	Recommended	This plan may be incorporated directly or by citing a reference to other plans or schedules.	4.5.2.2	
5.2.3	Resource allocation	Recommended	This plan may be incorporated directly or by citing a reference to other plans or schedules.	4.5.2.3	
5.2.4	Budget allocation	Recommended	This plan may be incorporated directly or by citing a reference to other plans or schedules.	4.5.2.4	
5.3	Control plan	Mandatory	This plan may be incorporated directly or by citing a reference to other plans.	4.5.3	
5.3.1	Requirements control plan	Mandatory		4.5.3.1	
5.3.2	Schedule control plan	Recommended	This plan may be incorporated directly or by citing a reference to other plans.	4.5.3.2	
5.3.3	Budget control plan	Recommended	This plan may be incorporated directly or by citing a reference to other plans.	4.5.3.3	

Table A.1—SPMP: Reference standard IEEE Std 1058-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
5.3.4	Quality control plan	Mandatory	This plan may be incorporated directly or by citing a reference to other plans.	4.5.3.4	
5.3.5	Reporting plan	Recommended		4.5.3.5	
5.3.6	Metrics collection plan	Mandatory	Describe the set of management indicators required for the duration of the project. It will identify when the metric collection activity will start and when it will stop. It will describe the indicators that trigger the management action plan to mitigate potential risks projected by the metrics. As a guidance, the following management indicators may be used: a) Requirements volatility b) Software size c) Problem/change report status d) Milestone performance e) Test procedures passed versus tests failed	4.5.3.6	
5.4	Risk management plan	Mandatory	This plan may be incorporated directly or by citing a reference to other plans.	4.5.4	
5.5	Project closeout plan	Recommended	This plan may be incorporated directly or by citing a reference to other plans.	4.5.5	
6.0	Technical process plans	Mandatory		4.6	
6.1	Process model	Mandatory	Include the Software Development Life Cycle. Describe inputs and outputs for each software development phase.		Added
6.2	Methods, tools, and techniques	Mandatory	For each SCI, describe the methods, tools, and techniques to be used.		Added

Table A.1—SPMP: Reference standard IEEE Std 1058-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
6.2.1	Software requirements analysis	Mandatory	Describe methods, tools, and techniques to be used.		Added
6.2.2	Software architecture design	Mandatory	Describe methods, tools, and techniques to be used.		Added
6.2.3	Software detailed design	Mandatory	Describe methods, tools, and techniques to be used.		Added
6.2.4	Software code and test	Mandatory	Describe methods, tools, and techniques to be used.		Added
6.2.4.1	Software coding standard	Mandatory	Describe methods, tools, and techniques to be used. See IEEE Std 730-2002, 4.5.2, item b), item c), and item d).		Added
6.2.5	Software integration	Mandatory	Describe methods, tools, and techniques to be used.		Added
6.2.6	Software qualification	Mandatory	Describe methods, tools, and techniques to be used.		Added
6.2.7	Software release	Mandatory	Describe methods, tools, and techniques to be used.		Added
6.2.8	Traceability	Mandatory	Describe methods, tools, and techniques to be used.		Added
6.3	Infrastructure plan	Recommended	This plan may be incorporated directly or by citing a reference to other plans.	4.6.3	
6.4	Product acceptance plan	Mandatory	This plan may be incorporated directly or by citing a reference to other plans.	4.6.4	
7.0	Supporting process plans	Mandatory		4.7	
7.1	Configuration management plan	Mandatory	Cite all SCMP(s) applicable to this project.	4.7.1	SCMP(s) shall be separate document(s).
7.2	Verification and validation plan	Mandatory	Cite all SVVP(s) applicable to this project.	4.7.2	SVVP(s) shall be separate document(s).
7.3	Documentation plan	Mandatory	Identify the documentation and standards governing the development, verification, validation, use, and maintenance of the work products.	4.7.3	Omit identification of project work products because they are included in 1.1.3.

Table A.1—SPMP: Reference standard IEEE Std 1058-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
7.4	Quality assurance plan	Mandatory	Cite all SQAP(s) applicable to this project.	4.7.4	SQAP(s) shall be separate document(s).
7.5	Reviews and audit plan	Mandatory	List all reviews and audits to be performed on the project. If the reviews and audits are detailed in the SQAP, SCMP, or SVVP, include a reference to that plan. If they are not detailed elsewhere, describe the review or audit in this section. Minimum requirements for reviews and audits to be performed are defined in IEEE Std 730-2002, IEEE Std 828-1998, and IEEE Std 1012-1998.	4.7.5	
7.6	Problem reporting and corrective action plan	Mandatory	Describe or reference the problem reporting and corrective action process for reporting, tracking, analyzing, and resolving the problems (including review issues, findings, and nonconformances) of all software work products and software processes. The objective is to provide a timely, responsible, and documented means to ensure that all discovered problems are reported, analyzed, tracked, and resolved, and that trends are recognized for the development process or product corrective actions. The SQAP and/or SCMP may include additional details.	4.7.6	Name changed and scope expanded.
7.7	Subcontractor management plans	Mandatory	This plan may be incorporated directly or by citing a reference to other plans not addressed by this standard.	4.7.7	
7.8	Process improvement plan	Recommended		4.7.8	

Table A.2—SQAP: Reference standard IEEE Std 730-2002

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
1.0	Purpose and scope	Mandatory		4.1	
1.1	Purpose	Mandatory	In addition, identify intended audience.	4.1	
1.2	Scope	Mandatory		4.1	
1.3	SQA objectives	Mandatory	Identify quality targets/goals.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
1.4	Software configuration items covered	Mandatory		4.1	
1.5	Applicable life cycle phases	Mandatory		4.1	
2.0	References	Mandatory		4.2	
3.0	Management	Mandatory		4.3	
3.1	Organization	Mandatory		4.3.1	
3.2	Tasks	Mandatory		4.3.2	
3.2.1	SQA tasks	Mandatory		4.3.2	

Table A.2—SQAP: Reference standard IEEE Std 730-2002 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
3.2.1.n	SQA task (n)	Mandatory	Each task shall have a unique subsection number. Title of task shall be descriptive of the task. Add entry and exit criteria for each task.	4.3.2, item b) 4.3.2, item c)	
3.2.2	Task milestones and schedule	Mandatory		4.3.2, item d)	
3.3	Roles and responsibilities	Mandatory		4.3.3	
3.4	Quality assurance and estimated resources	Mandatory	Include cost (recommended), effort, size, etc.	4.3.4	
4.0	Documentation	Mandatory		4.4.1, item b)	
5.0	Standards, practices, conventions, and metrics	Mandatory	Include other SQA standards practices and conventions not previously discussed in Section 4.	4.5	
5.1	SQA standards	Mandatory		4.5.1, item a) and b)	
5.2	SQA metrics	Mandatory		4.5.2, item f)	
6.0	Reviews and audits	Mandatory		4.6	
6.1	Purpose	Mandatory		4.6.1	
6.2	Minimum requirements	Mandatory		4.6.2	
6.2.1	Software specification review	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.6.2.1	
6.2.2	Architecture design review	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.6.2.2	
6.2.3	Detailed design review	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.6.2.3	
6.2.4	Software verification and validation plan review	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.6.2.4	

Table A.2—SQAP: Reference standard IEEE Std 730-2002 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
6.2.5	Functional audit	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.6.2.5	
6.2.6	Physical audit	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.6.2.6	
6.2.7	In-process audits	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.6.2.7	
6.2.8	Managerial reviews	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.6.2.8	
6.2.9	Software configuration management plan review	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.6.2.9	
6.2.10	Post-implementation plan review	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.6.2.10	
6.3	Other reviews and audits	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.6.3	
6.3.n	Other review/audit(n)	Mandatory	As required. Title of the review or audit shall be descriptive of the task. Limit discussion to SQA role's responsibilities in this activity.	4.6.3	
7.0	Test	Not required		4.7	Omit: All testing shall be described in the SVVP
8.0	Problem reporting and corrective action	Mandatory	Limit discussion to SQA role's responsibilities in this activity.	4.8	
9.0	SQA tools, technologies, and methodologies	Mandatory		4.9	
10.0	Media control	Not required		4.10	Omit: All documents and control are described in the SPMP.
11.0	Supplier control	Mandatory		4.11	

Table A.2—SQAP: Reference standard IEEE Std 730-2002 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
12.0	SQA records, collection, maintenance, and retention	Mandatory		4.12	
13.0	Training	Mandatory	Limit discussion to training on SQA tools and processes for the project team.	4.13	
14.0	Risk management	Mandatory	Limit discussions to risks associated with implementing the SQAP. These risks may be identified here or by citing a reference to a separate risk repository.	4.14	
15.0	Glossary	Mandatory		4.15	
15.1	Acronyms	Mandatory			Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
15.2	Definitions	Mandatory			Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
16.0	SQAP maintenance	Mandatory			Omit: Place history in Revision History section at front of document.

Table A.3—SCMP: Reference standard IEEE Std 828-1998

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997

Table A.3—SCMP: Reference standard IEEE Std 828-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
1.0	Introduction	Mandatory	Provide an overview of the document activities.	4.1	
1.1	Purpose	Mandatory	In addition, identify intended audience.	4.1	
1.2	Scope	Mandatory	Explain the software products, what they will and will not do, describe the application software specified and be consistent with the SRS or other documents.	4.1, item a)	
1.2.1	Software configuration items covered	Mandatory	Identify the software products by name.	4.1, item b)	
1.2.1.1	Lowest entity covered	Recommended	Identify lowest entity within the Software Configuration Items to which this document will be applied.	4.1, item b)	Added to be assured that the lowest level of software configuration item is covered.
1.2.1.2	Other entities covered (e.g., test or supporting software)	Recommended	Identify other SCIs covered, like support and test software.	4.1, item c)	
1.2.2	Software configuration management relationships to other configuration management	Mandatory	Define relationship to other hardware or system activities.	4.1, item d)	
1.2.3	Life cycle	Mandatory	Describe SCM formality degree, depth of control, and life cycle portion covered.	4.1, item e)	
1.2.4	Specific limitations and contraints	Recommended	Describe SCM limits, constraints such as time limits, etc.	4.1, item f)	
1.3	Assumptions	Mandatory	Describe assumptions that might impact ability to perform SCM activities like automated aids, schedule, and cost.	4.1, item g)	
1.3.1	Internal	Recommended		4.1, item g)	
1.3.2	Tools	Recommended		4.1, item g)	
1.3.3	Customer participation	Recommended		4.1, item g)	
1.4	Acronyms and definitions	Mandatory	Definitions of key terms.	4.1	

Table A.3—SCMP: Reference standard IEEE Std 828-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
1.4.1	Acronyms	Mandatory		4.1	
1.4.2	Definitions	Mandatory		4.1	
1.5	References	Mandatory	Complete list of all documents referenced within this document.	4.1	
2.0	SCM management	Mandatory		4.2	
2.1	Organization	Mandatory	Detailed in this section or cite in the SPMP.	4.2.1	
2.2	SCM responsibilities	Mandatory		4.2.2	
2.2.1	SCM roles	Mandatory		4.2.2	
2.2.1.1	Role 1	Mandatory	e.g., Software Configuration Control Board.	4.2.2	
2.2.1.1.1	Purpose and objectives	Mandatory		4.2.2, item a)	
2.2.1.1.2	Membership and affiliations	Mandatory		4.2.2, item b)	
2.2.1.1.3	Period of effectivity	Mandatory		4.2.2, item c)	
2.2.1.1.4	Scope of authority	Mandatory		4.2.2, item d)	
2.2.1.1.5	Operational procedures	Mandatory		4.2.2, item e)	
2.2.1.n	Role (n)	Recommended	Each role shall have a unique subsection number assigned and described in 2.2.1.1.1 through 2.2.1.1.5. (e.g., Customer, Quality Assurance, etc.).	4.2.2	
2.3	Applicable external plan policies, directives, and procedures	Mandatory		4.2.3	
2.4	SCM risk and abatement	Mandatory		IEEE/EIA Std 12207.1-1997, 5.2.2, item m)	Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
2.4.1	Risk identification	Mandatory	Limit discussions to risks associated with implementing SCM. These risks may be identified here or by citing a reference to a separate risk repository.	IEEE/EIA Std 12207.1-1997, 5.2.2, item m)	Added to satisfy requirements of IEEE/EIA Std 12207.1-1997

Table A.3—SCMP: Reference standard IEEE Std 828-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
2.4.2	Risk management	Mandatory	The risk management process may be identified here or by citing a reference to a separate risk repository.	IEEE/EIA Std 12207.1-1997, 5.2.2, item m)	Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
3.0	SCM activities	Mandatory		4.3	
3.1	Configuration identification	Mandatory		4.3.1	
3.1.1	Configuration item identification	Mandatory		4.3.1.1	
3.1.1.1	Configuration items	Mandatory		4.3.1.1	
3.1.1.2	Baseline definition	Mandatory		4.3.1.1, item a) through item d)	
3.1.2	Configuration item naming	Mandatory		4.3.1.2	
3.1.2.1	Documentation	Mandatory		4.3.1.2	
3.1.2.2	Source code	Mandatory		4.3.1.2	
3.1.2.3	Executable code	Mandatory		4.3.1.2	
3.1.2.4	Media	Mandatory	e.g., EPROM, Flash, Diskette, PCMCIA, etc.	4.3.1.2	
3.1.2.5	Subcontracted or commercial software identification	Mandatory		4.3.1.2	
3.1.2.6	Other configuration item identification	Recommended		4.3.1.2	
3.1.3	Acquiring configuration items	Mandatory		4.3.1.3	
3.1.3.1	Documentation	Mandatory		4.3.1.3	
3.1.3.2	Source code	Mandatory		4.3.1.3	
3.1.3.3	Library and component code	Mandatory		4.3.1.3	
3.1.3.4	Physical storage	Mandatory		4.3.1.3	
3.1.3.5	Configuration item retention and recovery	Mandatory		4.3.1.3	

Table A.3—SCMP: Reference standard IEEE Std 828-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
3.1.3.6	Configuration item distribution	Mandatory		4.3.1.3	
3.2	Configuration control	Mandatory		4.3.2	
3.2.1	Requesting changes	Mandatory		4.3.2.1	
3.2.2	Evaluating changes	Mandatory		4.3.2.2	
3.2.3	Approving changes	Mandatory		4.3.2.3	
3.2.3.1	Change approval	Mandatory		4.3.2.3	
3.2.3.1.1	Software configuration control board	Mandatory		4.3.2.3	
3.2.3.1.2	Product configuration control board	Recommended		4.3.2.3	
3.2.3.1.3	Document configuration control board	Recommended		4.3.2.3	
3.2.3.1.4	Other configuration control board	Recommended		4.3.2.3	
3.2.4	Implementing changes	Mandatory		4.3.2.4	
3.2.4.1	Change process	Mandatory		4.3.2.4	
3.2.4.2	Release process	Recommended		4.3.2.4	
3.3	Configuration status accounting	Mandatory		4.3.3	
3.3.1	SCI status accounting	Mandatory		4.3.3	
3.3.2	SCI baseline accounting	Mandatory		4.3.3	
3.4	Configuration audits and reviews	Mandatory		4.3.4	The SPMP and/or SQAP may include additional details.
3.4.1	Formal SCM audits	Mandatory		4.3.4	
3.4.2	In-process SCM audits	Mandatory		4.3.4	

Table A.3—SCMP: Reference standard IEEE Std 828-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
3.5	Interface control	Mandatory		4.3.5	
3.5.1	Dependencies	Mandatory		4.3.5	
3.5.1.1	System software	Recommended		4.3.5	
3.5.1.2	Hardware	Recommended		4.3.5	
3.5.1.3	Support software	Recommended		4.3.5	
3.5.1.4	Other	Recommended	Potential interfacing effects to be addressed.	4.3.5	
3.5.2	Interface configuration control	Mandatory		4.3.5	
3.6	Subcontractor and vendor control	Mandatory		4.3.6	
3.6.1	Third-party software	Mandatory		4.3.6	
3.6.2	Subcontracted software design	Mandatory		4.3.6	
3.6.3	Temporary personnel	Recommended		4.3.6	
4.0	SCM schedules	Mandatory	The schedule may be detailed here or by citing a reference to the SPMP.	4.4	
4.1	SCM sequence and dependencies	Mandatory		4.4	
4.2	SCM milestones and schedule	Mandatory	The milestones and schedule may be detailed here or by citing a reference to the SPMP.	4.4	
5.0	SCM resources	Mandatory	The resources may be detailed here or by citing a reference to the SPMP.	4.5	
5.1	Tools	Mandatory	List the SCM tools.	4.5	
5.1.1	Configuration management of tools	Mandatory	Include SCM tools used in the development and supporting processes.	4.5	
5.2	Techniques	Mandatory	Limit the discussions to the SCM techniques.	4.5	
5.3	Methodologies	Mandatory	Limit the discussions to the SCM methodologies.	4.5	

Table A.3—SCMP: Reference standard IEEE Std 828-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
5.4	Personnel	Mandatory	Limit the discussions to the personnel involved in SCM.	4.5	
5.5	Training	Mandatory	Limit the discussions to the SCM training to tools and processes for the project team.	4.5	
5.6	Environment and infrastructure	Mandatory		4.5	Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
5.7	SCM cost management	Recommended	The costs may be detailed here or by citing a reference to the SPMP.	4.5	Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
6.0	SCMP maintenance	Mandatory		4.6	
6.1	SCMP monitoring	Mandatory		4.6, item a)	
6.2	SCMP revision and approval	Mandatory		4.6, item b) and item c)	
6.3	SCMP change distribution	Mandatory		4.6, item d)	

Table A.4—SVVP: Reference standard IEEE Std 1012-1998

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997

Table A.4—SVVP: Reference standard IEEE Std 1012-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
1.0	Purpose and scope	Mandatory		7.1	
1.1	Purpose	Mandatory	In addition, identify intended audience.	7.1	
1.2	Scope	Mandatory		7.1	
1.3	Software configuration items covered	Mandatory	Identify each software configuration item.	7.1	
1.4	Maintenance	Mandatory			Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
2.0	References	Mandatory	Complete list of all documents referenced within this document.	7.2	
3.0	Definitions	Mandatory		7.3	
4.0	Overview	Mandatory		7.4	
4.1	Organization	Mandatory	Identify issuing organization.	7.4.1	
4.2	Master schedule	Mandatory		7.4.2	
4.3	Software integrity level scheme	Mandatory	The scheme for determining the SCI integrity level shall be documented, but the assignment of the integrity level to each SCI shall be documented in the SPMP in 1.1.1.	7.4.3	
4.4	Resources summary	Mandatory		7.4.4	
4.5	Responsibilities	Mandatory	This subclause shall also include the authorities.	7.4.5	
4.6	Tools, techniques, and methods	Mandatory	This subclause shall include any training required for each tool; technology and method used for the V&V activities.	7.4.6	
4.7	Metrics	Recommended		7.4.6	
5.0	Process	Mandatory		7.5	
5.1	Process management	Mandatory		7.5.1	
5.1.1	Activity management of V&V	Mandatory		7.5.1	

Table A.4—SVVP: Reference standard IEEE Std 1012-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
5.1.1.1	V&V tasks	Mandatory		7.5.1 1 Table 1 Table 2 Table 3	
5.1.1.2	Methods and procedures	Mandatory		7.5.1.2	
5.1.1.3	Inputs	Mandatory		7.5.1.3 Table 1	
5.1.1.4	Outputs	Mandatory		7.5.1.4 Table 1	
5.1.1.5	Schedule	Recommended		7.5.1.5	
5.1.1.6	Resources	Recommended		7.5.1.6	
5.1.1.7	Risks and assumptions	Recommended		7.5.1.7	
5.1.1.8	Roles and responsibilities	Recommended		7.5.1.8	
5.2	Process acquisition	Mandatory	Document, as needed, for the given project.	7.5.1	
5.2.1	Activity: Acquisition support V&V	Mandatory	Document, as needed, for the given project.	7.5.1	
5.2.1.1	V&V tasks	Mandatory		7.5.1 1 Table 1 Table 2 Table 3	
5.2.1.2	Methods and procedures	Mandatory		7.5.1.2	
5.2.1.3	Inputs	Mandatory		7.5.1.3 Table 1	

Table A.4—SVVP: Reference standard IEEE Std 1012-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
5.2.1.4	Outputs	Mandatory		7.5.1.4 Table 1	
5.2.1.5	Schedule	Recommended		7.5.1.5	
5.2.1.6	Resources	Recommended		7.5.1.6	
5.2.1.7	Risks and assumptions	Recommended		7.5.1.7	
5.2.1.8	Roles and responsibilities	Recommended		7.5.1.8	
5.3	Process supply	Mandatory		7.5.1	
5.3.1	Activity: Planning V&V	Mandatory		7.5.1	
5.3.1.1	V&V tasks	Mandatory		7.5.1 1 Table 1 Table 2 Table 3	
5.3.1.2	Methods and procedures	Mandatory		7.5.1.2	
5.3.1.3	Inputs	Mandatory		7.5.1.3 Table 1	
5.3.1.4	Outputs	Mandatory		7.5.1.4 Table 1	
5.3.1.5	Schedule	Recommended		7.5.1.5	
5.3.1.6	Resources	Recommended		7.5.1.6	
5.3.1.7	Risks and assumptions	Recommended		7.5.1.7	
5.3.1.8	Roles and responsibilities	Recommended		7.5.1.8	
5.4	Process development	Mandatory		7.5.1	
5.4.1	Activity: Concept V&V	Recommended		7.5.1	

Table A.4—SVVP: Reference standard IEEE Std 1012-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
5.4.1.1	V&V tasks	Recommended		7.5.1 1 Table 1 Table 2 Table 3	
5.4.1.2	Methods and procedures	Recommended		7.5.1.2	
5.4.1.3	Inputs	Recommended		7.5.1.3 Table 1	
5.4.1.4	Outputs	Recommended		7.5.1.4 Table 1	
5.4.1.5	Schedule	Recommended		7.5.1.5	
5.4.1.6	Resources	Recommended		7.5.1.6	
5.4.1.7	Risks and assumptions	Recommended		7.5.1.7	
5.4.1.8	Roles and responsibilities	Recommended		7.5.1.8	
5.4.2	Activity: Requirements V&V	Mandatory		7.5.1	
5.4.2.1	V&V tasks	Mandatory		7.5.1 1 Table 1 Table 2 Table 3	
5.4.2.2	Methods and procedures	Mandatory		7.5.1.2	
5.4.2.3	Inputs	Mandatory		7.5.1.3 Table 1	
5.4.2.4	Outputs	Mandatory		7.5.1.4 Table 1	

Table A.4—SVVP: Reference standard IEEE Std 1012-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
5.4.2.5	Schedule	Recommended		7.5.1.5	
5.4.2.6	Resources	Recommended		7.5.1.6	
5.4.2.7	Risks and assumptions	Recommended		7.5.1.7	
5.4.2.8	Roles and responsibilities	Recommended		7.5.1.8	
5.4.3	Activity: Design V&V	Mandatory		7.5.1	
5.4.3.1	V&V tasks	Mandatory		7.5.1 1 Table 1 Table 2 Table 3	
5.4.3.2	Methods and procedures	Mandatory		7.5.1.2	
5.4.3.3	Inputs	Mandatory		7.5.1.3 Table 1	
5.4.3.4	Outputs	Mandatory		7.5.1.4 Table 1	
5.4.3.5	Schedule	Recommended		7.5.1.5	
5.4.3.6	Resources	Recommended		7.5.1.6	
5.4.3.7	Risks and assumptions	Recommended		7.5.1.7	
5.4.3.8	Roles and responsibilities	Recommended		7.5.1.8	
5.4.4	Activity: Implementa-tion V&V	Mandatory		7.5.1	
5.4.4.1	V&V tasks	Mandatory		7.5.1 1 Table 1 Table 2 Table 3	

Table A.4—SVVP: Reference standard IEEE Std 1012-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
5.4.4.2	Methods and procedures	Mandatory		7.5.1.2	
5.4.4.3	Inputs	Mandatory		7.5.1.3 Table 1	
5.4.4.4	Outputs	Mandatory		7.5.1.4 Table 1	
5.4.4.5	Schedule	Recommended		7.5.1.5	
5.4.4.6	Resources	Recommended		7.5.1.6	
5.4.4.7	Risks and assumptions	Recommended		7.5.1.7	
5.4.4.8	Roles and responsibilities	Recommended		7.5.1.8	
5.4.5	Activity: Test V&V	Mandatory		7.5.1	
5.4.5.1	V&V tasks	Mandatory		7.5.1 1 Table 1 Table 2 Table 3	
5.4.5.2	Methods and procedures	Mandatory		7.5.1.2	
5.4.5.3	Inputs	Mandatory		7.5.1.3 Table 1	
5.4.5.4	Outputs	Mandatory		7.5.1.4 Table 1	
5.4.5.5	Schedule	Recommended		7.5.1.5	
5.4.5.6	Resources	Recommended		7.5.1.6	
5.4.5.7	Risks and assumptions	Recommended		7.5.1.7	
5.4.5.8	Roles and responsibilities	Recommended		7.5.1.8	
5.4.6	Activity: Installation and checkout V&V	Mandatory		7.5.1	

Table A.4—SVVP: Reference standard IEEE Std 1012-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
5.4.6.1	V&V tasks	Mandatory		7.5.1 1 Table 1 Table 2 Table 3	
5.4.6.2	Methods and procedures	Mandatory		7.5.1.2	
5.4.6.3	Inputs	Mandatory		7.5.1.3 Table 1	
5.4.6.4	Outputs	Mandatory		7.5.1.4 Table 1	
5.4.6.5	Schedule	Recommended		7.5.1.5	
5.4.6.6	Resources	Recommended		7.5.1.6	
5.4.6.7	Risks and assumptions	Recommended		7.5.1.7	
5.4.6.8	Roles and responsibilities	Recommended		7.5.1.8	
5.5	Process operation	Recommended		7.5.1	
5.5.1	Activity: Operation V&V	Recommended		7.5.1	
5.5.1.1	V&V tasks	Recommended		7.5.1 1 Table 1 Table 2 Table 3	
5.5.1.2	Methods and procedures	Recommended		7.5.1.2	
5.5.1.3	Inputs	Recommended		7.5.1.3 Table 1	

Table A.4—SVVP: Reference standard IEEE Std 1012-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
5.5.1.4	Outputs	Recommended		7.5.1.4 Table 1	
5.5.1.5	Schedule	Recommended		7.5.1.5	
5.5.1.6	Resources	Recommended		7.5.1.6	
5.5.1.7	Risks and assumptions	Recommended		7.5.1.7	
5.5.1.8	Roles and responsibilities	Recommended		7.5.1.8	
5.6	Process maintenance	Recommended		7.5.1	
5.6.1	Activity: Maintenance V&V	Recommended		7.5.1	
5.6.1.1	V&V tasks	Recommended		7.5.1 1 Table 1 Table 2 Table 3	
5.6.1.2	Methods and procedures	Recommended		7.5.1.2	
5.6.1.3	Inputs	Recommended		7.5.1.3 Table 1	
5.6.1.4	Outputs	Recommended		7.5.1.4 Table 1	
5.6.1.5	Schedule	Recommended		7.5.1.5	
5.6.1.6	Resources	Recommended		7.5.1.6	
5.6.1.7	Risks and assumptions	Recommended		7.5.1.7	
5.6.1.8	Roles and responsibilities	Recommended		7.5.1.8	
6.0	V&V reporting requirements	Mandatory		7.6	
6.1	Task reports	Mandatory	Specify the content, format, and timing.	7.6.1	

Table A.4—SVVP: Reference standard IEEE Std 1012-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
6.2	V&V activity summary reports	Mandatory	Specify the content, format, and timing.	7.6.2	
6.3	Anomaly report	Mandatory	Specify the content, format, and timing.	7.6.3	
6.4	V&V final report	Mandatory	Specify the content, format, and timing.	7.6.4	
6.5	Special studies report	Recommended		7.6 Optional 1	
6.6	Other reports	Recommended		7.6 Optional 2	
7.0	V&V administrative requirements	Mandatory		7.7	
7.1	Anomaly resolution and reporting	Mandatory		7.7.1	
7.2	Task iteration policy	Mandatory		7.7.2	
7.3	Deviation policy	Mandatory		7.7.3	
7.4	Control procedures	Mandatory	Reference the SCMP, SPMP, and SQAP, if appropriate.	7.7.4	
7.5	Standards, practices, and conventions	Mandatory		7.7.5	
8.0	V&V documentation requirements	Not required		7.8	Omit from SVVP, include content in SPMP

Table A.5—SVVR: Reference standard IEEE Std 1012-1998

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
1.0	Purpose and scope	Mandatory		7.1	
1.1	Purpose	Mandatory	In addition, identify intended audience.	7.1	
1.2	Scope	Mandatory		7.1	
1.3	Software configuration items covered	Mandatory	Identify the SCI(s) covered.	7.1	
2.0	References	Mandatory	Complete list of all documents referenced within this document.	7.2	
3.0	Definitions	Mandatory		7.3	
4.0	Overview	Mandatory		7.4	
4.1	Report organization	Mandatory	Identify the V&V reporting organization and clearly represent the relationship with the other processes such as development, project management, quality assurance, and configuration management. This subclause shall also define the issuing organization.	7.4.1 Annex F	
5.0	Verification and validation reports	Mandatory		7.6	
5.n	SCI (n)	Mandatory	Each SCI shall have a unique subsection number.	7.6.2 7.6.4	

Table A.6—SRS: Reference standard IEEE Std 830-1998

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
1.0	Introduction	Mandatory	Include issuing organization.	5.1	Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
1.1	Purpose	Mandatory	In addition, identify intended audience.	5.1.1	
1.2	Scope	Mandatory		5.1.2	
1.3	Definitions, acronyms, and abbreviations	Mandatory		5.1.3	
1.4	References	Mandatory		5.1.4	
1.5	Overview	Mandatory		5.1.5	
1.6	Maintenance	Mandatory		IEEE/EIA Std 12207.1-1997	
2.0	Overall description	Mandatory		5.2	
2.1	Product perspective	Mandatory		5.2.1	
2.1.1	System interfaces	Mandatory	Include high-level functionality and system constraints. Details in 3.1.	5.2.1.1	
2.1.2	User interfaces	Mandatory	Include high-level functionality and system constraints. Details in 3.1.	5.2.1.2	
2.1.3	Hardware interfaces	Mandatory	Include high-level functionality and system constraints. Details in 3.1.	5.2.1.3	

Table A.6—SRS: Reference standard IEEE Std 830-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
2.1.4	Software interfaces	Mandatory	Include high-level functionality and system constraints. Details in 3.1.	5.2.1.4	
2.1.5	Communica-tion interfaces	Mandatory	Include high-level functionality and system constraints. Details in 3.1.	5.2.1.5	
2.1.6	Memory constraints	Mandatory	Include high-level functionality and system constraints. Details in 3.1.	5.2.1.6	
2.1.7	User operations	Mandatory	Include high-level functionality and system constraints. Details in 3.1.	5.2.1.7	
2.1.8	Site adaptation requirements	Mandatory	Include high-level functionality and system constraints. Details in 3.1.	5.2.1.8	
2.2	Product functions	Mandatory		5.2.2	
2.3	User characteristics	Mandatory		5.2.3	
2.4	Constraints	Mandatory	Include safety specifica-tions, if applicable.	5.2.4	
2.5	Assumptions and dependencies	Mandatory		5.2.5	
2.6	Apportioning of requirements	Mandatory		5.2.6	
3.0	Specific requirements	Mandatory		5.3	
3.1	External interfaces	Mandatory		5.3.1	
3.1.1	User interfaces	Recommended		5.3.1 and 5.2.1.2	
3.1.2	Hardware interfaces	Recommended		5.3.1 and 5.2.1.3	
3.1.3	Software interfaces	Recommended		5.3.1 and 5.2.1.4	
3.1.4	Communica-tion interfaces	Recommended		5.3.1 and 5.2.1.5	
3.1.5	Other interfaces	Recommended		5.3.1 and 5.2.1.	

Table A.6—SRS: Reference standard IEEE Std 830-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
3.2(a)	Functions	Either 3.2 (a), (b), or (c) Mandatory	By Function SRS Architecture. See table note. Document approach to follow organization defined in SPMP.	5.3.2, 5.3.7.1, 5.3.7.2 5.3.7.5, 5.3.7.6, 5.3.7.7 5.3.8 Annex A.1, A.2, A.3, A.6, A.7, or A.8	Choose either (a), (b), or (c) organization for section 3.2
3.2.n	Function/ mode/stimulus/ process/user (n)	Mandatory	Each function/mode/ stimulus/process/user shall have a unique subsection number.	5.3.2	
3.2(b)	Classes/objects	Either 3.2 (a), (b), or (c) Mandatory	By Class or Object SRS Architecture. See table note. Document approach to follow organization defined in SPMP.	5.3.2, 5.3.7.3 Annex A.4	Choose either (a), (b), or (c) organization for 3.2
3.2.n	Class/object (n)	Mandatory	Each class/object shall have a unique subsection number.	5.3.2	
3.2(c)	Features	Either 3.2 (a), (b), or (c) Mandatory	By Feature SRS Architecture. See table note. Document approach to follow organization defined in SPMP.	5.3.2, 5.3.7.4 Annex A.5	Choose either (a), (b), or (c) organization for 3.2
3.2.n	Feature (n)	Mandatory	Each feature shall have a unique subsection number.	5.3.2	
3.3	Performance requirements	Mandatory	Real Time Requirements, etc.	5.3.3	
3.4	Logical database requirements	Mandatory		5.3.4	
3.5	Design contraints	Mandatory		5.3.5	
3.5.1	Standards compliance	Mandatory		5.3.5.1	

Table A.6—SRS: Reference standard IEEE Std 830-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
3.5.2	Hardware limitations	Recommended			Added
3.5.n	Other constraints	Recommended	Each additional constraint shall have a unique sub-section number.		Added
3.6	Software system attributes	Mandatory		5.3.6	
3.6.1	Reliability	Mandatory		5.3.6.1	
3.6.2	Availability	Mandatory		5.3.6.2	
3.6.3	Security	Mandatory		5.3.6.3	
3.6.4	Maintainability	Mandatory		5.3.6.4	
3.6.5	Portability	Mandatory		5.3.6.5	
3.6.n	Attribute (n)	Recommended	Each attribute shall have a unique subsection number.	5.3.6	Added
NOTE—Look to IEEE Std 830-1998 for informative formatting samples of 3.2.					

Table A.7—SDD: Reference standard IEEE Std 1016-1998

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
1.0	Introduction	Mandatory			
1.1	Purpose	Mandatory	In addition, identify intended audience.		

Table A.7—SDD: Reference standard IEEE Std 1016-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
1.2	Scope	Mandatory	Identify the software products by name, explain what the software products will and will not do, describe the application software specified, and be consistent with the SRS or other documents.		
1.3	Definitions, acronyms, and abbreviations	Mandatory	Provide the definitions, acronyms, and abbreviations required to properly interpret this document.		
1.4	Document organization	Mandatory	Document the software methods or representations used (e.g., Data Flow Diagrams, Structure Charts, Finite state machines, Object-Oriented Diagrams, or other design techniques). Define the view(s) for the design entities and their attributes, and for each view, define the document format and specify where the design entities and their attributes are described within the document.		Added section to present how the entities and their attributes will be presented in document Section 3
2.0	References	Mandatory	Complete list of all documents referenced within this document.		
3.0	Software design	Mandatory	Description of the design following the organization of views specified in 1.4. Regardless of the design view(s) presented, each entity attribute for each entity shall be present.	5.2 and 5.3	

Table A.8—ICD: No reference standard

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		
1.0	Introduction	Mandatory			
1.1	Purpose	Mandatory	In addition, identify intended audience.		
1.2	Scope	Mandatory			
1.3	Abbreviations, acronyms, and definitions	Mandatory			
1.5	References	Mandatory	Complete list of all documents referenced within this document.		
2.0	Interfaces	Mandatory			
2.n	Interface identification and description	Mandatory	Each interface identification and description (n) shall have a unique subsection number. Identify each interface by a project-unique identifier. Briefly identify the interfacing entities. Divide the section as needed to describe the interface characteristics: a) Interface purpose b) Type of interface c) Priority d) Interface functions e) Input and output items		
2.n.1	Interface context	Mandatory	Context diagram/information for each interface (n).		

Table A.8—ICD: No reference standard *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
2.n.2	Interface requirements	Mandatory	For each interface (n), the origination, destination, stimulus, protocol, and data characteristics. Combine requirements, and design into one section: a) Software interface requirements b) Data requirements c) Performance requirements d) Redundancy requirements		
2.n.3	Interface design	Mandatory	For each interface (n), include enough detail to allow coding without further information: a) Interface data description b) Interface signals c) Protocol description		

Table A.9—DBDD: Reference standard EIA/IEEE J-STD- 016-1995

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		
1.0	Scope and purpose	Mandatory			
1.1	Identification	Mandatory		Annex G.2.3	

Table A.9—DBDD: Reference standard EIA/IEEE J-STD- 016-1995 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
1.2	Database overview	Mandatory		Annex G.2.3	
1.3	Document overview	Mandatory	Provide a map of the database design elements and their attributes, identified by the design approach, with the document format/layout.	Annex G.2.3	
2.0	References	Mandatory	Complete list of all documents referenced within this document.	Annex G.2.3	
2.1	Abbreviations	Mandatory	Makes the DBDD consistent with all spec documents.		Added
2.2	Definitions	Mandatory	Makes the DBDD consistent with all spec documents.		Added
3.0	Database-wide design decisions	Mandatory	Document the rationale for key database-wide design decisions or other decisions affecting further design of the database. Document the rationale for an unusual design selection. Document engineering tradeoff decisions, assumptions, performance, and maintenance assumptions that affect the design. Present design decisions about the database's behavioral design (how it will behave, from a user's point of view, in meeting its requirements, ignoring internal implementation). Capture the decision methodology criteria along with the ultimate decision.	Annex G.2.3	
3.1	Database management selection	Mandatory	If a commercial DBMS is selected, this section names the DBMS tool, references information about the tool, and specifies the methodology and/or criteria for selection. If no commercial DBMS is selected, this section specifies what will be used, details the functionality, and specifies the rationale for this choice.		

Table A.9—DBDD: Reference standard EIA/IEEE J-STD- 016-1995 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
3.2	Database consumers	Mandatory	List all consumers of the database information. Consumers may be operators (persons) or may be other software programs or systems.		
3.2.n	Consumer (n)	Recommended	Each consumer shall have a unique subsection number. For each consumer listed, specify characteristics of the consumer (e.g., access rights).		
3.2.n.1	Database inputs/queries	Recommended	List the acceptable inputs or queries that can be performed by this consumer, and include all attributes (e.g., response times).		
3.2.n.2	Database outputs/ displays	Recommended	Specify how the database information will be output or displayed to this consumer, and include all attributes (e.g., frequency).		
3.3	Database performance constraints	Mandatory	If there are no database-wide performance/design constraints, then specify this here. Otherwise, specify the details of the performance/design constraints in the following sections. Possible performance/design constraint areas include, but are not limited to, availability, security, privacy protection, database distribution, updates and maintenance, backup and restoration, optimizing strategies and considerations, storage and size considerations, and population of the database and capture of legacy data.		

Table A.9—DBDD: Reference standard EIA/IEEE J-STD- 016-1995 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
3.3.n	Performance constraints (n)	Recommended	Each performance constraint shall have a unique subsection number. Specify the design decisions that are applicable to the specific performance constraint, listed above.		
3.4	Standard data descriptions	Mandatory			
3.4.1	Data repository	Recommended	Include cross-organizational view of a data, data mining.		
4.0	Design of the database	Mandatory	The complete design of the database (data elements and interrelationships), and for each element, the attributes shall be specified here. Presentation of the design is based on the design methodology used and shall map directly with the format/layout as specified in 1.3. NOTE—The database design approach shall be documented in the SPMP.	Annex G.2.3	

Table A.9—DBDD: Reference standard EIA/IEEE J-STD- 016-1995 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
5.0	Software units	Mandatory	List and describe each software unit, or designator of a group of software units, used for database access or manipulation. If there are none, specify this. Reference software modules defined within the SDD, if best described in the SDD. Make this just like the SDD-defined in the SPMP for the SDD format. Software Units are included here only if they relate closely to the format of the database (e.g., knows the format of the database tables). An example of such software units would be programs that isolate the database format from the application level programs. These programs would be included here. Otherwise the independent applications should be documented in a separate SDD.	Annex G.2.3	
6.0	Requirements traceability	Mandatory	Use text, lists, or tables to specify the requirement's traceability within the document or a reference to another document of report from an automated tool if traceability is documented elsewhere.	Annex G.2.3	
7.0	Notes	Recommended		Annex G.2.3	
A	Annexes	Recommended		Annex G.2.3	

Table A.10—SRTM: No reference standard

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		
1.0	Introduction	Mandatory	Provide an overview of the document activities.		
1.1	Purpose	Mandatory	In addition, identify intended audience.		
1.2	Scope	Mandatory	In addition, identify intended audience.		
1.3	Document organization	Mandatory	Describe the presentation of the SRTM views in Section 3, and for each view, define the document format and specify the intended use of the view.		
2.0	References	Mandatory	Complete list of all documents referenced within this document.		
3.0	Traceability	Mandatory	Present either the table below or, at a minimum, the six views defined below: 1) Source Document Reference to SRS Reference. 2) SRS Reference to Source Document Reference 3) SRS Reference to STPr identifier 4) STPr identifier to SRS Reference 5) SRS Reference to SDD/ICD/DBDD Reference 6) SDD/ICD/DBDD Reference to SRS Reference		

Table A.11—Traceability matrix

Source document reference	Source requirement description	SRS reference	SDD/ICD/DBDD reference	STPr reference	Other reference/ comments
Source document identifier and specific section number (and paragraph number if necessary) (lowest resolution possible) of the requirement that was assigned to software during the System Requirements Analysis and System Design.	Description of the requirement from the source document (summary or complete text)	The unique requirement identifier and document identifier (SRS) for this software requirement.	The design entity(ies) identifier(s) and document identifier (SDD/ICD/DBDD) for the design that implements this software requirement.	The software test procedure identifier(s) for the tests that validate this software requirement.	References to other documents or additional comments

Definition of each column

Source document reference: This column shall contain a backward reference to appropriate Source Document and the specific section from which this requirement was derived. The Source Document may be the Scope of Work, the Operations Requirement Document, the Request for Proposal, the System Specification, and so on. The section reference should provide a reference to each sentence within the Source Document that represents a software requirement.

Source requirement description: This column shall contain either the exact requirement text from the Source Document or an abbreviated description of the requirement. The authority having jurisdiction shall define the content of this column. When deciding whether to break a statement into individual requirements, the analyst should consider how the requirement would be tested. If the requirement is tested by a single test procedure, then the requirement probably does not need to be broken down further. If the requirement is tested by multiple test procedures, then the requirement should be broken down into multiple requirements. It is important to follow a consistent and documented methodology for breaking down requirements.

SRS reference: This column shall contain a forward reference to the document identifier (SDD/ICD/DBDD) and a unique identifier for each requirement within the document. All software requirements shall be mapped to one or more section(s). The reference to the SDD/ICD/DBDD section number shall correspond to the lowest level of detail defined within the SDD/ICD/DBDD Table of Contents.

SDD/ICD/DBDD reference: According to IEEE Std 1016-1998, "In a complete SDD, each requirement shall be traceable to one or more design entities. Entities can exist as a system, subsystems, data stores, modules, programs and processes." This column shall contain a forward reference to the document identifier (SDD/ICD/DBDD) and a unique reference to one or more design entity(ies).

STPr reference: This column shall provide a forward reference to the Software Test Procedure identifier in which this software requirement shall be validated.

Other reference/comments: This column shall provide references to other documents or free-form comments as necessary.

Table A.12—STP: Reference standard IEEE Std 829-1998

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
1.0	Test plan identifier	Mandatory		4.2.1	
2.0	Introduction	Mandatory		4.2.2	
2.1	Objectives	Mandatory		4.2.2	
2.2	Scope	Mandatory	In addition, identify intended audience.	4.2.2	
2.3	References	Mandatory	Complete list of all documents referenced within this document.	4.2.2	
3.0	Test items	Mandatory		4.2.3	
4.0	Features to be tested	Mandatory		4.2.4	
5.0	Features not tested	Mandatory		4.2.5	
6.0	Approach	Mandatory		4.2.6	

Table A.12—STP: Reference standard IEEE Std 829-1998 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
7.0	Item pass/fail criteria	Mandatory		4.2.7	
8.0	Suspension criteria and resumption requirements	Mandatory		4.2.8	
9.0	Test deliverables	Mandatory		4.2.9	
10.0	Testing tasks	Mandatory		4.2.10	
11.0	Environmental need	Mandatory		4.2.11	
12.0	Responsibili-ties	Mandatory		4.2.12	
13.0	Staffing and training needs	Mandatory		4.2.13	
14.0	Schedule	Mandatory		4.2.14	
15.0	Risks and contingencies	Mandatory		4.2.15	
16.0	Approvals	Mandatory		4.2.16	

Table A.13—STPr: Reference standard IEEE Std 829-1998

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
1.0	Test procedure specification identifier	Mandatory		7.2.1	
2.0	Purpose	Mandatory	In addition, identify intended audience.	7.2.2	
3.0	Special requirements	Mandatory		7.2.3	
4.0	Procedure steps	Mandatory		7.2.4	
4.1	Log	Mandatory		7.2.4.1	
4.2	Set up	Mandatory		7.2.4.2	
4.3	Start	Mandatory		7.2.4.3	
4.4	Proceed	Mandatory		7.2.4.4	
4.5	Measure	Mandatory		7.2.4.5	
4.6	Shutdown	Mandatory		7.2.4.6	
4.7	Restart	Mandatory		7.2.4.7	
4.8	Stop	Mandatory		7.2.4.8	
4.9	Wrap up	Mandatory		7.2.4.9	
4.10	Contingencies	Mandatory		7.2.4.10	

Table A.14—STR: Reference standard IEEE Std 829-1998

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/ EIA Std 12207.1-1997
1.0	Test summary report identifier	Mandatory		11.2.1	
2.0	Summary	Mandatory		11.2.2	
3.0	Variances	Mandatory		11.2.3	
4.0	Comprehen-siveness assessment	Mandatory		11.2.4	
5.0	Summary of results	Mandatory		11.2.5	
6.0	Evaluation	Mandatory		11.2.6	
7.0	Summary of activities	Mandatory		11.2.7	
8.0	Approvals	Mandatory		11.2.8	

Table A.15—SVD: Reference standard EIA/IEEE J-STD-016-1995

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
1.0	Scope	Mandatory	In addition, identify intended audience.		
1.1	Identification	Mandatory		Annex I.2.2, 1.1	
1.2	System overview	Mandatory		Annex I.2.2, 1.2	
1.3	Document overview	Recommended		Annex I.2.2, 1.3	
1.4	Definitions, acronyms, and abbreviations	Mandatory			
2.0	References	Mandatory	Complete list of all documents referenced within this document.	Annex I.2.2, 2	
3.0	Version description	Mandatory		Annex I.2.2, 3	
3.1	Inventory of materials released	Mandatory		Annex I.2.2, 3.2	
3.1.1	Executable software	Mandatory	Identify the media the executable software is delivered on. Include any batch files, command files, etc., needed to install and operate the software.	Annex I.2.1, 3.1	
3.1.2	Packaging requirements	Mandatory	Identify requirements for packaging and delivering the software.	Annex I.2.1, 3.3	

Table A.15—SVD: Reference standard EIA/IEEE J-STD-016-1995 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
3.1.3	Qualification provisions	Mandatory	Identify the method to be used to ensure the executable software delivered is a valid copy. This may be done by verifying a Checksum or cyclical redundancy check, etc.	Annex I.2.1, 4	
3.2	Inventory of software contents	Mandatory	Identify the revisions of the software files using the version control repository identifier.	Annex I.2.2, 3.2	
3.3	Changes installed	Mandatory	Identify the changes since the last release.	Annex I.2.2, 3.3	
3.4	Adaptation data	Mandatory		Annex I.2.2, 3.4	
3.5	Related documents	Mandatory		Annex I.2.2, 3.5	
3.6	Installation instructions	Mandatory	Reference the SUM unless the installation process is unique for this version release.	Annex I.2.2, 3.6	
3.7	Software maintenance information	Mandatory		Annex I.2.1, 5	
3.7.1	Compilation/ build procedures	Mandatory	Identify all the tools, by version number, used to develop the software. Describe the compilation/ build processes required to produce the executable software from the source file.	Annex I.2.1, 5.2	
3.7.2	Computer hardware resource utilization	Mandatory	Document the “as built” software resource utilization.	Annex I.2.1, 5.4	
3.8	Possible problems and known errors	Mandatory	List any known anomalies with the released software.	Annex I.2.2, 3.7	
3.9	Compatibility information	Mandatory	Describe the versions of hardware or software that are compatible with this version.		Added

Table A.16—SUM: Reference standard EIA/IEEE J-STD-016-1995

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
Title page	Date of issue and document status	Mandatory	See IEEE Std 1558, 6.2.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Revision history	Change history	Mandatory	See IEEE Std 1558, 6.3.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
Table of contents	Table of contents	Mandatory	See IEEE Std 1558, 6.4.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of figures	List of figures	Mandatory	See IEEE Std 1558, 6.5.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
List of tables	List of tables	Mandatory	See IEEE Std 1558, 6.6.		Added to satisfy requirements of IEEE/EIA Std 12207.1-1997
1.0	Scope	Mandatory	In addition, identify intended audience.	Annex J.2.1, 1	
1.1	Identification	Mandatory		Annex J.2.1, 1.1	
1.2	System overview	Mandatory		Annex J.2.1, 1.2	
1.3	Document overview	Recommended		Annex J.2.1, 1.3	
2.0	References	Mandatory	Complete list of all documents referenced within this document.	Annex J.2.1, 2	
3.0	Software summary	Mandatory		Annex J.2.1, 3	
3.1	Software application	Mandatory		Annex J.2.1, 3.1	
3.2	Software inventory	Mandatory	From the user's perspective, and is not all files contained in the SCI.	Annex J.2.1, 3.2	
3.3	Software environment	Mandatory	Identify the hardware and software manual installation resources.	Annex J.2.1, 3.3	
3.4	Software organization and overview of operation	Mandatory	Include how to initialize the software on startup.	Annex J.2.1, 3.4	
3.5	Contingencies and alternative states and modes of operation	Mandatory		Annex J.2.1, 3.5	
3.6	Security and privacy	Mandatory		Annex J.2.1, 3.6	

Table A.16—SUM: Reference standard EIA/IEEE J-STD-016-1995 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
3.7	Assistance and problem reporting	Mandatory	Whom to contact if a problem is encountered and how to generate a problem report.	Annex J.2.1, 3.7	
4.0	Accessing the software	Mandatory		Annex J.2.1, 4	
4.1	First-time user	Mandatory		Annex J.2.1, 4.1	
4.1.1	Equipment familiarization	Mandatory		Annex J.2.1, 4.1.1	
4.1.2	Access control	Mandatory		Annex J.2.1, 4.1.2	
4.1.3	Installation and setup	Mandatory		Annex J.2.1, 4.1.3	
4.1.3.1	Firmware programming instructions	Mandatory		Annex I.2.4, 3	
4.1.3.1.1	Description of preprogrammed device	Mandatory	Describe the physical characteristics of the target memory device.	Annex I.2.4, 3.x.1	
4.1.3.1.2	Software to be programmed in the device	Mandatory	Identify the software to be loaded in the target memory device.	Annex I.2.4, 3.x.2	
4.1.3.1.3	Programming equipment	Mandatory	Document the equipment used to program the target memory device. If the device is programmed differently in the field than in the factory, identify both sets of equipment.	Annex I.2.4, 3.x.3	
4.1.3.1.4	Programming software	Mandatory	Document the software used to program the target memory device. If the device is programmed differently in the field than in the factory, identify both sets of equipment.	Annex I.2.4, 3.x.4	
4.1.3.1.5	Programming procedures	Mandatory	Document the procedures used to program and reprogram the target memory device. Include the procedures to install the software, checkout the software, and protect the software against load failures.	Annex I.2.4, 3.x.5	

Table A.16—SUM: Reference standard EIA/IEEE J-STD-016-1995 *(continued)*

Document section	Content list	Applicability	Guidance	Reference standard clause	Changes to reference standard
4.1.3.1.6	Installation and repair procedures	Mandatory		Annex I.2.4, 3.x.6	
4.1.3.1.7	Vendor information	Mandatory		Annex I.2.4, 3.x.7	
4.2	Initiating a session	Mandatory		Annex J.2.1, 4.2	
4.3	Stopping or suspending the software	Mandatory		Annex J.2.1, 4.3	
5.0	Processing reference guide	Mandatory		Annex J.2.1, 5	
5.1	Capabilities	Mandatory		Annex J.2.1, 5.1	
5.2	Conventions	Mandatory		Annex J.2.1, 5.2	
5.3	Processing procedure	Mandatory		Annex J.2.1, 5.3	
5.4	Related processing	Mandatory		Annex J.2.1, 5.4	
5.5	Data backup	Mandatory	Procedures for creating and backing up data.	Annex J.2.1, 5.5	
5.6	Recovery from error, malfunction, emergencies	Mandatory		Annex J.2.1, 5.6	
5.7	Messages	Mandatory	List or reference any error message the user will encounter while performing the user's functions.	Annex J.2.1, 5.7	
5.8	Quick-reference guide	Mandatory		Annex J.2.1, 5.8	
6.0	Notes	Recommended		Annex J.2.1, 6	
A	Annexes	Recommended		Annex J.2.1, A	

Annex B

(informative)

Bibliography

[B1] IEEE 100, The Authoritative Dictionary of IEEE Standards Terms.

[B2] *Webster's New Collegiate Dictionary*. Springfield, MA: Merriam-Webster, Inc.