IEEE Standard for Technical Reviews and Audits on Defense Programs

1. Overview

1.1 Scope

This standard establishes the requirements for technical reviews and audits to be performed throughout the acquisition life cycle for the US Department of Defense (DoD) and other defense agencies. This standard provides the definition, description, and intent, as well as the entry, exit and success criteria, for each technical review and audit. It is to be used to establish agreement between acquirers and suppliers on the technical reviews and audits that are needed for the project, as well as the focus and expectations of each technical review and audit.

1.2 Purpose

This standard is intended to elaborate the technical review and audit clause of ISO/IEC/IEEE 15288, System life-cycle processes, for use by the DoD and other defense agencies in acquiring systems (and parts thereof) or services. It amplifies ISO/IEC/IEEE 15288, subclause 6.3.2.3.a, for selection, negotiation, agreement, and performance of the necessary technical reviews and audits, while allowing tailoring flexibility for the variety of acquisition situations/environments when the technical reviews or audits are conducted. While primarily supporting the acquirer-supplier agreement mode, this standard also can be used to support the other modes such as use by organizations, projects, and process assessors.

NOTE—The acquirer-supplier mode is not necessarily limited to a government acquirer and corporate prime contractor supplier situation. For example, a service component program executive officer (PEO) might be considered the acquirer, and the applicable government program office/manager the supplier for internal government reviews. Depending on how a given service or other DoD agency operates, the government might be the acquirer and their systems engineering and technical assistance (SETA) contractor might be responsible for the conduct of a subset of the reviews in this standard. Similarly, a defense contractor could be the acquirer and a key subcontractor could be the supplier. In the case of a contractor's internal research and development (R&D), corporate management could be the acquirer and the company's R&D organization could be the supplier.[1]

1.3 Field of application

This standard addresses the needs of the defense community with respect to the incorporation, implementation, and execution of technical reviews and audits. IEEE Std 15288.1-2014, the standard that implements ISO/IEC/IEEE 15288 for application on defense programs, provides the defense-specific language and terminology to ensure the correct application of acquirer-supplier requirements for technical reviews and audits on a defense program, while this standard provides the implementation details to fulfill those requirements.[2]

1.4 Organization of this standard

Subclause 1.5 defines what it means for an organization, project, or other users such as process authors and assessors to claim conformance with this standard.

Clause 2 defines normative references, i.e., documents that are indispensable in the application of this standard.

Clause 3 provides definitions of terms peculiar to this standard, as well as acronyms and abbreviations used in this standard.

Clause 4 provides an overview of technical reviews and audits. It defines them, discusses their role in the US DoD acquisition life cycle, and their support of specific ISO/IEC/IEEE 15288 processes. It answers questions such as: "What are technical reviews and audits?" "Why perform them?" "Is there a standard set of them, and if so, what are they?"

Clause 5 specifies the minimum set of required properties for each technical review and audit that form the basis for agreement between defense program acquirers and suppliers.

Clause 6 provides the detailed criteria to be addressed for each technical review and audit contained in Clause 5.

Clause 7 provides, for each technical review and audit contained in Clause 5 of this standard, detailed, best-practice guidance for applying the detailed criteria of the corresponding portion of Clause 6 of this standard to various kinds of defense programs.

Annex A, Annex B, Annex C, and Annex D contain examples of other technical reviews that DoD acquisition programs may find useful, based on the complexity, nature, and domain of the systems that are being developed or acquired by those programs.

Annex E contains a bibliography.

[1] Notes in text, tables, and figures of a standard are given for information only and do not contain requirements needed to implement this standard.

[2] ISO/IEC publications are available from the ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland (http://www.iso.org/). ISO/IEC publications are available in the United States from the American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, USA (http://www.ansi.org/).

1.5 Conformance

1.5.1 General

The requirements in this standard are contained in Clause 5 and Clause 6. This standard provides requirements for a number of technical reviews and audits to be conducted throughout the acquisition life cycle of a system. Since particular projects or organizations may not need to use all of the reviews and audits provided by this standard, implementation of this standard may involve selecting a set of reviews and audits suitable to the project or organization. There are two ways that an implementation can be claimed to conform to the requirements of this standard. Any claim of conformance is cited in only one of the two forms below.

NOTE— Evidence of conformance can be as simple as including traceability from the requirements in this standard to the conforming policies, processes, and procedures. This could be provided by various means, including as a separate section in the traceability documentation for the system requirements or in the Systems Engineering Management Plan (SEMP).

1.5.2 Full conformance

A claim of full conformance declares the set of technical reviews and audits for which conformance is claimed. Full conformance is achieved by providing evidence that all of the mandatory requirements of the declared set of reviews and audits have been satisfied.

1.5.3 Tailored conformance

When this standard is used as a basis for establishing a set of technical reviews and audits that do not qualify for full conformance, the reviews and audits in this standard are selected or modified in accordance with the tailoring process defined in 5.1.1.2**.**

NOTE 1—In this document, the word *shall* is used to indicate a mandatory requirement. The word *should* is used to indicate a recommendation. The word *may* is used to indicate a permissible action. The word *can* is used for statements of possibility and capability.

NOTE 2—When this standard is used to help develop an agreement between an acquirer and a supplier, the contents of Clause 5 and Clause 6 can be selected for incorporation in the agreement with or without modification. In this case, it is more appropriate for the acquirer and supplier to claim compliance with the agreement than conformance with this standard.

NOTE 3—The acquirer request for proposal includes the intended tailoring of the requirements in this standard. However, the supplier may propose additional changes or alternatives during the steps to finalize the agreement.

Conformance to this standard can be claimed by a project or organization independent of a claim of compliance to a specific agreement.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

ISO/IEC/IEEE 15288:2015(E), Systems & software engineering—System life cycle processes.[3]

IEEE Std 15288.1™-2014, IEEE Standard for Application of Systems Engineering on Defense Programs.[4, 5]

3. Definitions, acronyms, and abbreviations

For the purposes of this document, the following terms and definitions apply. The *IEEE Standards Dictionary Online* and the *Department of Defense Dictionary of Military and Associated Terms* (Joint Publication 1-02) [B4] should be consulted for terms not defined in this clause.[6]

3.1 Definitions

acceptability criteria: A documented set of characteristics of a program's work products that if satisfied, forms a sufficient basis for judging each product's content to be acceptable to support a successful review or audit.

configuration audit: A detailed review of processes, product definition information, documented verification of compliance with requirements, and an inspection of products to confirm that products have achieved their required attributes or conform to released product configuration definition information.

entry criteria: Artifacts and other review or audit elements that must be completed before the review or audit can be conducted.

exit criteria: Review or audit elements that must be assessed, completed, and action items closed before successful completion of the technical review or audit can be declared.

review/audit outputs: Review or audit artifacts that are expected through conduct of the technical review or audit and that may be considered elements of exit criteria.

system: The product of an acquisition process that is delivered to the user.

NOTE—Although the term *system* can apply to any level of complexity or detail, when this standard is applied to a specific acquisition, the term *system* will refer to a given solution that satisfies the requirements of a particular acquirer-supplier agreement and may apply equally to the acquisition of a completely new system or to the addition or upgrade to an existing system.

system specification: The documented set of mandatory requirements for a system.

---

[3] This publication is available from the Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, Piscataway, NJ 08854, USA (http://standards.ieee.org/).
[4] IEEE publications are available from the Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, Piscataway, NJ 08854, USA (http://standards.ieee.org/).
[5] Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the standard.
[6] *IEEE Standards Dictionary Online* subscription is available at:
http://www.ieee.org/portal/innovate/products/standard/standards_dictionary.html.

NOTE—The more generic term is used for consistent terminology within this standard and includes terms such as System Performance Specification (SPS), System Requirements Document (SRD), and System/Subsystem Specification (SSS).

technical reviews: A series of systems engineering activities conducted at logical transition points in a system life cycle, by which the progress of a program is assessed relative to its technical requirements using a mutually agreed-upon set of criteria.

NOTE—Includes both incremental and system perspectives, as applicable, and considers technical maturity amidst programmatic constraints (cost/schedule), to ascertain readiness to proceed to subsequent activities with acceptable risk.

3.2 Acronyms and abbreviations

AoA	analysis of alternatives
ASR	alternative systems review
BIT	built-in test
C4I	command, control, communications, computer, and intelligence
CAI	critical application item
CAIV	cost as an independent variable
CARD	cost analysis requirements description
CCB	configuration control board
CDD	capability development document
CDR	critical design review
CDRL	contract data requirements list
CI	configuration item
CM	configuration management
CMP	configuration management plan
COMSEC	communications security
CONOPS	concept of operations
COTS	commercial off-the-shelf
CPD	capability production document
CPI	critical program information
CSC	computer software component
CSI	critical safety item
CSU	computer software unit
DMS	diminishing manufacturing sources
DoD	Department of Defense
DoDAF	Department of Defense architecture framework
DR	decision review
DSP	digital signal processor

DT	development test
DT&E	development test and evaluation
ECP	engineering change proposal
EDRAP	engineering data requirements agreement plan
EMC	electromagnetic compatibility
EMD	engineering and manufacturing development
EMI	electromagnetic interference
ESOH	environment, safety, and occupational health
EVM	earned value management
FCA	functional configuration audit
FD	full deployment
FMECA	failure modes, effects, and criticality analysis
FOC	full operational capability
FPGA	field programmable gate array
FRACAS	failure reporting and corrective action system
FRP	full-rate production
FRR	flight readiness review
HALT	highly accelerated life testing
HSI	human systems integration
HWCI	hardware configuration item
ICD	initial capabilities document
IEC	International Electrotechnical Committee
IEEE	The Institute of Electrical and Electronics Engineers
IMP	integrated master plan
IMS	integrated master schedule
IOC	initial operational capability
IOT&E	initial operational test and evaluation
IPT	integrated product team
IRR	integration readiness review
IRS	interface requirements specification
ISO	International Organization for Standardization
KPP	key performance parameter
KSA	key system attribute
LCC	life-cycle cost
LCCE	life-cycle cost estimate
LCSP	life-cycle sustainment plan
LFT&E	live fire test and evaluation

LRIP	low-rate initial production
M&S	modeling and simulation
MOE	measure of effectiveness
MOP	measure of performance
NDI	non-developmental item
NIST	National Institute of Standards and Technology
O&S	operations and support
OT	operational test
OTE	operational test and evaluation
OTA	operational test agency
OTRR	operational test readiness review
P&D	production and deployment
PCA	physical configuration audit
PDR	preliminary design review
PEO	Program Executive Office
PM&P	parts, materials, and processes
PMO	program management office
PP	program protection
PPP	program protection plan
PPSL	program parts selection list
PRR	production readiness review
PSP	product support plan
QA	quality assurance
R&D	research and development
R&M	reliability and maintainability
RAM-C	reliability, availability, maintainability, and cost
RTCA	real time casualty assessment
SAD	software architecture description
SAR	software requirements and architecture review
SCRM	supply chain risk management
SDP	software development plan
SE	systems engineering
SEE	software engineering environment
SEMP	Systems Engineering Management Plan
SEP	Systems Engineering Plan
SETA	systems engineering and technical assistance
SETR	systems engineering technical review

SFR	system functional review
SIL	system integration laboratory
SME	subject matter expert
SoS	system of systems
SPS	system performance specification
SRD	system requirements document
SRR	system requirements review
SRS	software requirements specification
SSE	system security engineering
SSR	software specification review
SSS	system/subsystem specification
STP	software test plan
SVD	software version description
SVR	system verification review
SWCI	software configuration item [(synonymous with computer software configuration item (CSCI)]

NOTE—The state of hardware technology progression has resulted in the functionality of software code being realized by its execution while embedded in devices that are not properly described as computers (e.g., DSPs, FPGAs). This standard uses SWCI to encompass the broader execution environment of software code.

T&E	test and evaluation
TBD	to be determined
TDP	technical data package
TEMP	Test and Evaluation Master Plan
TIM	technical interchange meeting
TMRR	technology maturation and risk reduction
TOC	total ownership cost
TPM	technical performance measure
TR	technical report
TRR	test readiness review
US	United States
V&V	verification and validation
VCRM	verification cross-reference matrix
WBS	work breakdown structure