

THE BENEFITS AND OBJECTIVES OF A
CORPORATE-STANDARD PROJECT-LEVEL
SOFTWARE QUALITY PROGRAM (SQP)

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ABSTRACT

This paper advocates the development of corporate-standard project-level Software Quality Programs (SQPs) and associated Software Quality Program Plans (SQPPs). It also states their detailed objectives, compares the quality-related tasks of the independent Software Quality professionals with that of other members of the project, and provides a comprehensive bibliography of common documents containing software quality requirements.

INTRODUCTION

The four horsemen of the Software Apocolypse -- Failed Requirements, Poor Maintainability, Cost Overruns, and Schedule Slippages -- continue to infuriate developers, customers, and users alike. And all significant software projects still suffer from their combined onslaught. It is for this reason that requirements for the implementation of project-level Software Quality Programs -- also known as Software Quality Assurance, Quality Control, Quality Evaluation, and Verification Programs -- have been developed and imposed in an attempt to unseat the first two of these four enemies of software success.

The definition of software quality depends strongly upon the person defining it. To the user, it is software that reliably does what it is supposed to do, or at least what he expects it to do. To those who must maintain software, the most important criteria is maintainability. To those who determine the requirements for new software systems, software quality is best defined as a weighted summation of many software quality factors or "ilities" (e.g., reliability, portability, maintainability, testability, correctness, etc.). To the developer, however, software quality is primarily the meeting of requirements, usually contractual, and this last definition is what dominates the developer's project-level Software Quality Program (SQP) and its associated Software Quality Program Plan (SQPP).

Different contracts require software developers to comply with different military, governmental, industrial, or customer-related requirements concerning the establishment and implementation of project-level SQPs. Although the format requirements for the associated SQPPs vary greatly, the content requirements naturally exhibit extensive overlap. By taking advantage of this overlap, a single, easily-tailored, corporate SQP and SQPP can be developed that will result in numerous critical benefits.

BENEFITS

The most important benefit of possessing a single corporate-standard project-level SQP and SQPP is INCREASED QUALITY:

- 1) A single corporate SQP and SQPP spans many projects and is subject to a controlled continuous process of improvement and the incorporation of lessons learned during these previous projects. This contrasts greatly with the common approach in which some archived SQPP is hurriedly plagiarized, often by a member of a proposal team who is not a SQ professional.
- 2) The corporate SQPP is guaranteed to meet customer requirements once it has been validated against all common requirements documents.
- 3) An off-the-shelf corporate SQP does not suffer from schedule deadlines and insufficient staffing during the initial phases of the project. It therefore is much less likely to contain hurried and substandard work.
- 4) The corporate SQPP enhances proper understanding of the SQP, both among management and project personnel.

Another important benefit of possessing a single corporate-standard project-level SQP and SQPP is INCREASED PRODUCTIVITY:

- 1) The continual creation of project-specific SQPPs, the equivalent of reinventing the wheel for each new project, is prevented.
- 2) The development effort (and cost) of the corporate SQPP is amortized over many projects, thus lowering the SQP cost per project.
- 3) During the critical early phases of the software life-cycle, Software Quality Assurance can concentrate on implementing the SQP rather than on developing it.
- 4) The corporate SQPP forms the natural basis for a corporate-level Software Quality Standards and Procedures Manual. The needless reinvention of most project quality standards and procedures is prevented.
- 5) The corporate SQPP is ready-made, easily tailored, and allows precious time to be spent on other areas during proposal work.

- 6) With inadequate SQPPs no longer causing contracts to be lost, proposal work will not be wasted.
- 7) Since only one SQP and SQPP must be mastered, project personnel need only pass through the unproductive initial part of the "learning curve" once.

Another major benefit of a corporate SQPP is DECREASED DEVELOPMENT RISKS:

- 1) The corporate SQPP is a proven tool, subject to constant updating and incorporating lessons learned from previous projects.
- 2) The corporate SQPP requires proper corrective action, ensuring that problems are identified and corrected early in the life-cycle while they are still manageable and relatively inexpensive to correct.
- 3) The corporate SQPP will ensure Requirements, Process, and Support Quality, thereby making the achievement of Software Quality possible.

One also achieves the benefit of INCREASED MANAGEMENT CONTROL:

- 1) The corporate SQPP, once validated, ensures adequate and objective reporting of software quality and status.
- 2) The use of a corporate SQPP allows management experience to be carried over from project to project.
- 3) The corporate SQPP enhances corporate recognition of the proper funding requirements of the SQP.

Finally, one achieves the benefit of INCREASED CUSTOMER/USER SATISFACTION:

- 1) SQP and SQPP requirements need only be verified once in depth, instead of once per project.
- 2) Use of a consistent SQP will result in a reputation for consistent success and excellence.
- 3) The previously mentioned benefits will also promote customer/user satisfaction.

OBJECTIVES OF THE SQP

The vital first step in the development of an effective corporate-standard project-level SQP is the establishment of its objectives (see Figure 1). With an approved set of specific, implementable, cost-effective, enforcable, understandable, and verifiable objectives:

- 1) The scope and direction of the SQP will be clear.
- 2) The SQP will tend to reflect actual needs more than specific externally-imposed requirements.
- 3) Proper review and evaluation of the SQP will be made possible because reference criteria will exist with which to judge effectiveness.
- 4) A proper foundation will exist from which to project necessary quality-related staffing and funding levels for both the development and implementation of corporate-standard and project-specific SQPs and SQPPs.

ENSURE SOFTWARE QUALITY (SQP01)

Ensure Requirements Quality (SQP02)

Ensure Process Quality (SQP03)

Ensure Proper Evaluation (SQP10)

Ensure Corrective Action (SQP11)

Ensure Proper SQ-related Documentation (SQP12)

Ensure Support Quality (SQP04)

Ensure Customer/User Satisfaction (SQP05)

Ensure Cost Savings (SQP06)

Decrease Development Risks (SQP07)

Meet Cost and Schedule Projections (SQP08)

Meet SQP Requirements (SQP09)

Figure 1: Hierarchy of Software Quality Program Objectives

And unless this list of objectives is complete, one cannot ensure that the resulting corporate-standard SQP and SQPP will meet the requirements of all future projects.

The primary objective of any corporate-standard or project-specific Software Quality Program (SQP) is to:

SQPO1) ENSURE SOFTWARE QUALITY <See footnote 1>.

In complete detail, one must assess, measure, evaluate, document, and ensure, throughout the project during each phase of contract performance, that all:

- 1) Deliverable (contractually-required) software <See footnote 2> and related documentation as well as all
- 2) Nondeliverable design, operational, support, and test software and related documentation (except when specifically exempted) [DI-R-2174A, DOD-STD-2168, MIL-STD-SQAM, TB 18-102] <See footnote 3>

which is acquired, developed, modified, tested, implemented, and/or maintained under contract meet all software requirements including:

- 1) Contractual requirements [AQAP-13, DI-R-X105, DODD 4155.1, DOD-STD-1679A, DOD-STD-SQR, FAA-STD-018, MIL-Q-9858A, MIL-S-52779A, MIL-STD-SQAM, NSAM 81-2, USACSC REG 5-5] including:
 - a) Functional/performance/sizing/etc. requirements,

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- <1> Each objective has been labeled for easy reference. A list of these objectives can form the foundation of a corporate-standard SQP and can be used as review criteria for project-specific SQPs.
 - <2> For the purpose of this paper, the term software shall include computer programs, computer-processable data, and firmware. The hardware aspects of firmware, however, are beyond the scope of software quality.
 - <3> Referenced statements meet or exceed specific requirements of the referenced documents (e.g., the scope of the referenced requirement may be unnecessarily restricted to a single project organization such as Independent Testing). See Reference Section. References have been clearly identified in order to facilitate the use of this document in the preparation and tailoring of the Objectives Section of project-specific SQPs.

- b) Software quality-factor requirements [MIL-M-85337 (AS)],
 - c) SQP and SQPP requirements <See footnote 4> [DI-R-S174A, DOD-STD-SQR, MIL-STD-SQAM, NHB 5300.4(1B), NHB 5300.4(1D-2), NSAM 81-2, TB 18-102].
- 2) Derived requirements,
 - 3) Project and corporate software engineering policy requirements and standards,
 - 4) Project and corporate software quality engineering policy requirements and standards [DOD-STD-SQR].

In order to meet this primary objective, the scope of the SQP (and SQPP) must include not only Software Quality, but also Requirements Quality, Process Quality, and Support Quality. Thus, the first three secondary objectives of any project-level SQP should be to ensure:

- 1) Requirements Quality.
- 2) Process Quality.
- 3) Support Quality.

SQPO2) ENSURE REQUIREMENTS QUALITY.

During all phases of contract performance, one must document, establish, evaluate, control, and maintain, clear (unambiguous), complete, consistent, cost-effective (from a life-cycle perspective), current, practical (feasible and implementable), necessary, measureable and quantifiable (where practical), objective, testable or demonstratable, and verifiable (traceable) software requirements [AFR 74-1, DODD 4155.1, DOD-STD-2167, MIL-STD-SQAM, NHB 5300.4(1B), NHB 5300.4(1D-2), NSAM 81-2].

Though often overlooked, the secondary objective of ensuring Requirements Quality is critical. More projects have floundered upon the deadly shoals of vague, untestable, incomplete, and shifting requirements than for any other reason. This is why the most important phase of the software life-cycle is the requirements analysis phase. It is also the greatest single cause of cost overruns, "maintenance" costs, and schedule slippages.

<4> For example, conformance with AQAP-13 or MIL-S-52779A.

SQP03) ENSURE PROCESS QUALITY.

During all phases of contract performance, one must:

- 1) Ensure that a project Software Engineering Methodology and Software Quality Engineering Methodology is:
 - a) Properly established, documented (e.g., in policy statements, plans, standards, and procedures), and periodically evaluated [AQAP-13, DOD-STD-2167, DOD-STD-2168].
 - b) Adequate, complete, conformant (e.g., to contract requirements), cost-effective from a life-cycle perspective, effective, definitive, efficient, enforceable, practical (feasible and implementable), internally consistent, and meet or exceed industry standards [USACSC REG 5-5].
 - c) Properly implemented, supported, and enforced throughout the project [DOD-STD-1679A, DOD-STD-2167, MIL-Q-9858A, NSAM 81-2].
- 2) Ensure that all project activities (e.g., requirements analysis, preliminary and detailed design, coding, integration and testing, audits, inspections, reviews, administrative activities, etc.) are:
 - a) Properly identified in the appropriate methodology documents [NAVELEX INST 5200.23].
 - b) Adequate, complete, cost-effective from a life-cycle perspective, efficient, and effective [DODD 4155.1, FAA-STD-018, NOSC TN 410].
 - c) Subject to adequate SQ-related controls [FAA-STD-018, NHB 5300.4(1D-2)].
 - d) In conformance with these methodologies as documented [DOD-STD-2167, MIL-STD-SQAM, NAVELEX INST 5200.23, NOSC TN 410, NSAM 81-2, USACSC REG 5-5].
- 3) Ensure that the responsibility for all oversight, verification, and validation activities is properly assigned to specific project entities which exhibit an appropriate degree of organizational independence [NAVELEX INST 5200.23].

This secondary objective is crucial because one cannot ensure software quality without ensuring process quality. Quality must be built in for it cannot be tested in, and it is

through methodology and software development activities that quality is built into software. It is only by concentrating on the way software is developed and maintained that increases in productivity and quality are possible.

SQP04) ENSURE SUPPORT QUALITY.

During all phases of contract performance, one must ensure that:

- 1) Project management, personnel, resources, facilities, and support tools (e.g., Ada Programming Support Environments, Configuration Management Software, etc.) are [AQAP-13, DI-R-2174A, DOD-STD-2167, MIL-STD-SQAM]:
 - a) Sufficient to meet all project goals and contractual obligations.
 - b) Properly organized and structured (e.g., the Software Quality Assurance organization must be administratively independent from the software development organizations).
 - c) Cost-effective from a life-cycle perspective, effective, efficient, and productive.
- 2) The accountability for, and the development of, adequate and required Software Quality Assurance (SQA) and Software Quality Control <See Footnote 5> functions are encompassed within the SQP [MIL-M-85337(AS)].
- 3) Adequate training and participation of all project personnel in the SQP is provided for [NHB 5200.4(1B)].

This final secondary objective is crucial because a lack of adequate staffing or software support tools or a poor project organization can make adequate software quality impossible.

Four other important secondary objectives of a project-level SQP are to:

SQP05) ENSURE CUSTOMER/USER SATISFACTION.

During all phases of contract performance, one must ensure customer and/or user satisfaction with contract-deliverable software and related documentation [DODD 4155.1].

<5> See the SQA vs. SQC Section for the distinction between SQA and SQC.

SQP06) ENSURE COST SAVINGS.

One must ensure substantial software life-cycle cost savings [NOSC TN 410] through:

- 1) Increased productivity.
- 2) Increased reliability and maintainability.
- 3) Increased emphasis on the initial phases of the software life-cycle (i.e., the earlier a problem is discovered and fixed, the less expensive it is).
- 4) Increased emphasis on error prevention over error repair (e.g., reduce rework during development).

SQP07) DECREASE DEVELOPMENT RISKS.

During all phases of contract performance, one must decrease software development risks by:

- 1) Ensuring the early discovery and correction of errors through audits, inspections, and reviews.
- 2) Ensuring independent and objective status reporting [TB 18-102].
- 3) Ensuring proper requirements verification and validation.

SQP08) MEET COST AND SCHEDULE PROJECTIONS.

One must ensure that all contract-deliverable software and related documentation and services are delivered on schedule and within costs or the SQP is almost certain to suffer during any deadline or budget crunches. Although not normally considered within the scope of the SQP, this objective must be considered because of its significant impact upon ensuring software quality. It also is closely related to ensuring process quality because unproductive processes produce schedule slippages which in turn result in a lack of methodology enforcement and decreased software quality.

SQP09) MEET SQP REQUIREMENTS.

During all phases of contract performance, one must ensure that the SQP:

- 1) Is effectively tailored to exhibit the proper degree of formality and control commensurate with the:

- a) Software requirements,
- b) Size, scope, and complexity of the project,
- c) Significance and criticality of the software,
- d) Current phase of the software life-cycle,
- e) Support requirements, and
- f) Development risks

in order to satisfy all contract requirements at minimal expense and risk [MIL-Q-9858A, MIL-S-52779A, NOSC TN 410, NSAM 81-2, NSAM 81-3, USACSC REG 5-5].

- 2) Is economically planned, cost-effective from a life-cycle perspective, and developed, implemented, documented, managed, and maintained in consonance with, or as an extension of, the contractor/developer's other Product Assurance <See footnote 6>, administrative, and technical requirements, specifications, programs, and functions [AQAP-13, DI-R-2174A, MIL-Q-9858A, MIL-S-52779A, NHB 5300.4(1B)].
- 3) Meets specific contract requirements for the establishment, implementation, management, and maintenance of a project-level SQP [DOD-STD-2167, DOD-STD-SQR, FAA-STD-016, FAA-STD-018, MIL-S-52779A, MIL-STD-SQAM, NAVELEX INST 5200.23, NHB 5300.4(1B), NHB 5300.4(1D-2), NSAM 81-2, MIL-M-85337(AS), MIL-Q-9858A].
- 4) Meets all relevant contract CONTENT requirements for SQPs that may be encountered in current and future projects (Note: This objective applies to corporate-standard SQPs only). The list of references at the end of this document contains the majority of such requirements.

Since the importance of Process Quality was recognized prior to the importance of Requirements Quality and Support Quality, the major tertiary objectives of project-level SQPs that have been identified to date are all expansions of objective SQP03 "ENSURE PROCESS QUALITY". These tertiary objectives are to:

<6> Software Quality Assurance, Configuration Management, Data/Documentation Management, Independent Integration and Test, Metrics Group.

SQP10) ENSURE PROPER EVALUATION.

During all phases of contract performance, one must:

- 1) Ensure the evaluation and validation of software quality (e.g., accuracy, correctness, and performance) [DOD-STD-1679A, DOD-STD-2167, NAVELX INST 5200.23, USACSC REG 5-5], requirements quality, process quality [AFR 74-1], and support quality.
- 2) Ensure that these evaluations (i.e., scheduled and unscheduled audits, inspections, reviews, etc.) are performed:
 - a) In sufficient number,
 - b) With sufficient technical depth,
 - c) Of sufficient scope,
 - d) In accordance with the relevant plans and procedures, and
 - e) With the necessary objectivity and organizational independenceto ensure Software Quality [AFR 74-1].
- 3) All evaluation results document a true measurement of software quality, requirements quality, process quality, and/or support quality [NOSC TN 410].
- 4) Provide project management with continuous, independent, and objective evaluations, assessments, and recommendations of Software Quality [DOD-STD-2167], project status, and progress [TB 18-102] by being an integral part of the project management reporting system [DOD-STD-1679A, DOD-STD-SQR].

SQP11) ENSURE CORRECTIVE ACTION.

During all phases of contract performance, one must provide a timely and effective Corrective Action System for:

- 1) The early detection, analysis, prevention, and reporting (to the appropriate management level) of actual or potential project and product deficiencies, system incompatibilities, marginal quality, and trends or conditions which could result in unsatisfactory quality [AFR 74-1, AQAP-13, DOD-STD-SQR, MIL-Q-9858A, MIL-S-52779A, NHB 5300.4(1B), NSAM 81-2, NSAM 81-3, USACSC REG 5-5].

- 2) Ensuring that the conditions/causes producing these deficiencies/problems are identified and corrected [AFR 74-1, NHB 5300.4(1D-2)].
- 3) Providing for and ensuring the prompt effective correction of these problems [AQAP-13, DOD-STD-SQR, MIL-Q-9858A, MIL-S-52779A, NHB 5300.4(1B), NSAM 81-2, NSAM 81-3].

SQP12) ENSURE PROPER SQ-RELATED DOCUMENTATION.

During all phases of contract performance, one must ensure that complete, current, and objective documentation of SQP tasks and activities (e.g., reports) is maintained and made available for review by the customer (or user), its representative(s), designated Independent Verification and Validation (IV&V) personnel, and senior management [AQAP-13, DOD-STD-2167].

OBJECTIVES OF THE SQPP

The corporate-standard project-level Software Quality Program Plan (SQPP) is the foundation upon which the corresponding SQP is built. Without a SQPP, a SQP cannot be established or implemented. For the same reasons given before, it is just as important to begin by establishing the objectives of the SQPP as it was to establish the objectives of the SQP.

The primary objective of any project-level SQPP, be it corporate-standard or project-specific, should be to:

SQPP01) DOCUMENT THE PROJECT SQP.

The SQPP should formally establish and document the project SQP [MIL-S-52779A, MIL-Q-9858A].

In addition to this primary objective, the following secondary objectives also exist:

SQPP02) BE THE MASTER SQP DOCUMENT.

The SQPP should be the master planning and controlling document for the SQP [NHB 5300.4(1D-2)].

SQPP03) DESCRIBE THE SOFTWARE QUALITY ENGINEERING METHODOLOGY.

The SQPP should describe the specific project Software Quality Engineering Methodology (e.g., techniques, procedures, etc.) to be performed in implementing the SQP [DI-ECRS-8XX5, DI-R-1710].

SQPP04) ENSURE AN ORGANIZED APPROACH.

The SQPP should ensure an organized approach for the achievement of all contract requirements [NHB 5300.4(1B), NHB 5300.4(1D-2)].

SQPP05) ALLOCATE SQP FUNCTIONS.

The SQPP should allocate all of the required SQP functions (e.g., SQA and SQC authority, responsibilities, and tasks) to specific project organizational entities [NSAM 81-2].

SQPP06) SUPPORT SENIOR MANAGEMENT.

The SQPP should provide senior management with:

- 1) The means with which to convey to project personnel its commitment to, and support of, the SQP.
- 2) A standard against which to monitor the SQP [DI-R-217A].

SQPP07) SUPPORT PROJECT PERSONNEL.

The SQPP should provide project personnel with the necessary information and authority [MIL-S-52779A] to:

- 1) Successfully implement the SQP.
- 2) Meet all project software quality goals and requirements.

SQPP08) SUPPORT THE CUSTOMER/USER.

The SQPP should:

- 1) Provide the customer (or user), its representative(s), and IV&V personnel (if any) with the detailed documentation required to properly monitor, verify, and validate during all phases of contract performance the SQP as implemented, the organizational entities responsible for Software Quality, and the related policies, methodologies, standards, procedures, and tools to be followed/used by these organizations [AQAP-13, DI-ECRS-8XX5, DI-R-2174A, DI-R-X105, MIL-STD-SQAM].

- 2) Provide the customer/user with a vehicle for the formal approval of, or concurrence with, the SQP and SQPP [DI-R-2174A, MIL-Q-9858A].

SQPP09) SUPPORT SUBCONTRACTORS.

The SQPP should provide subcontractor/vendor/consultant personnel with the detailed requirements of their SQPs and SQPPs.

SQPP10) DEMONSTRATE CONTRACTOR COMPETENCE.

The SQPP should demonstrate contractor recognition and understanding of the software quality aspects and requirements of the contract [NAVELEX INST 5200.23, NHB 5300.2(1B), NHB 5300.4(1D-2)].

SQPP11) MEET CONTRACT REQUIREMENTS.

The SQPP should meet specific contract requirements for the establishment, delivery, implementation, and maintenance of a SQPP [AQAP-13, DI-ECRS-8XX5, DI-R-X105, DOD-STD-2167, DOD-STD-SQR, FAA-STD-016, FAA-STD-018, IEEE STD. 730-1984, MIL-M-85337(AS), MIL-S-52779A, MIL-STD-SQAM, NAVELEX INST 5200.23, NOSC TN 410, NHB 5300.4(1B), NHB 5300.4(1D-2), NSAM 81-2, TB 18-102].

SQA vs. SQC

Since each member of the project impacts software quality, each member shares responsibility for the success or failure of the Software Quality Program (SQP). Thus, the SQP and SQPP apply to all project personnel, both internal and external (e.g., subcontractors, vendors, and consultants), and achieving software quality is NOT the exclusive responsibility of the project Software Quality Assurance (SQA) Manager, the project SQA organization <See footnote 7>, or any other single person or organization within the project [DOD-STD-1679A, FAA-STD-016, MIL-STD-SQAM].

Nevertheless, there are three very important reasons why the project personnel who implement the SQP must be divided into two distinct groups. These are:

<7> SQP and SQPP are used in this paper instead of SQA Program and SQA Plan because the most common definition of SQA is the independent SQ organization and it is clear that the SQP and SQPP should have a significantly wider applicability.

- 1) The need to provide a central administrative focus to the SQP.
- 2) The need to ensure a source of technically competent SQ professionals whose overriding concern is software quality.
- 3) The need to ensure an oversight and reporting function independent of the development staff who often suffer from a deadline vs. quality conflict of interest.

The most efficient way of dealing with these three concerns has been to allocate them to a single independent organization assigned to the project: Software Quality Assurance. The main tasks of SQA are therefore to:

- 1) Administer the SQP including:
 - a) Tailoring the SQP and SQPP to the project (where necessary).
 - b) Administering the SQA staff.
 - c) Training project personnel concerning the SQP and Software Quality Engineering Methodology.
- 2) Contribute to the establishment of the software requirements including special emphasis on the:
 - a) Software quality-factor requirements.
 - b) SQP and SQPP requirements.
 - c) Project software engineering and software quality engineering policy requirements and standards.
- 3) Perform independent audits of:
 - a) Software quality.
 - b) Requirements quality.
 - c) Process quality.
 - d) Support quality.
- 4) Participate in formal project activities including:

- a) Formal audits.
- b) Formal reviews.
- c) Software Configuration Control Board and other formal technical board meetings.
- d) Acceptance testing.

The remaining aspects of the SQP are for the most part performed by the developers rather than the independent SQA organization. In order to differentiate their role from that of SQA, I would propose that the term Software Quality Control (SQC) refer to all non-SQA aspects of the SQP.

REFERENCES

A standard project-level SQP and SQPP should meet or exceed the software quality related requirements of the following documents:

AFR 74-1	Quality Assurance Program, USAF Air Force Regulation, 06/01/79
AQAP-13	NATO Software Quality Control System Requirements, NATO Allied Quality Assurance Production, August 1981
DI-ECRS-8XX5 (draft)	Software Quality Evaluation Plan, DOD Data Item Description, 01/11/84
DI-R-1710	Quality Program Plan, US Army Data Item Description, 12/15/69
DI-R-2174A	Software Quality Assurance Plan, U.S. Navy Data Item Description, 22/10/83
DI-R-X105 (draft)	Software Quality Assurance Plan, DOD Data Item Description, 12/25/83
DODD 4155.1	Quality Program, DOD Department of Defense Directive, 08/10/78
DOD-STD-1679A	Software Development, U.S. Navy Military Standard, 10/22/83.
DOD-STD-2167	Defense System Software Development, DOD

(draft-SDS)	Military Standard, 01/30/85
DOD-STD-2168 (draft-SQS)	Software Quality Evaluation, DOD Military Standard, 28/02/85
DOD-STD-SQR (cancelled)	Software Quality Requirements for Software Systems Development and Production, DOD DOD Standard, 05/04/84 <See footnote 8>
FAA-STD-016	Quality Control System Requirements, Department of Transportation Federal Aviation Administration Standard, 08/27/75
FAA-STD-018	Computer Software Quality Program Requirements, Department of Transportation Federal Aviation Administration Standard, 05/26/77
IEEE STD 730-1984	Software Quality Assurance Plans, IEEE IEEE Standard, 06/30/84
MIL-M-85337 (AS)	Manuals, Technical: Requirements for Quality Assurance Program, U.S. Navy Military Specification, 09/23/80
MIL-Q-9858A	Quality Program Requirements, DOD Military Specification, 12/16/63
MIL-S-52779A	Software Quality Assurance Program Requirements, DOD Military Specification, 08/01/79
MIL-STD-SQAM (cancelled)	Software Quality Assessment and Measurement, DOD Military Standard, 01/10/82 <See footnote 8>
NAVELEX INST 5200.23	Computer Software Life Cycle Management Guide, Naval Electronic Systems Command Guidebook, 03/01/79
NHB 5300.4(1B)	Quality Program Provisions for Aeronautical and Space System Contractors, NASA Handbook, April 1969
NHB 5300.4(1D-2)	Safety, Reliability, Maintainability and Quality Provisions for the Space Shuttle Program, NASA Handbook, October 1979
NOSC TN 410	Software Quality Control Practices Manual, Naval Ocean Systems Center Technical Note, 05/01/78
NSAM 81-2	NSA/CSS Software Acquisition Manual, National Security Agency Central Security Service Manual, 12/21/78

NSAM 81-3	NSA/CSS Software Product Standards Manual, National Security Agency Central Security Service Manual, 07/26/79
TB 18-102 (proposed)	Army Automation Quality Program, U.S. Army Technical Bulletin, July 1983
USACSC REG 5-5	Management Quality Assurance Program, U.S. Army Computer Systems Command Regulation, 03/12/82

<8> Though cancelled, these documents nevertheless contain a wealth of information that can be used in the production of a corporate-standard project-level SQP and SQPP.