Annex B

(informative)

Software specification review (SSR)

B.1 General

Some department of defense (DoD) domains may require an SSR due to the nature and complexity of the system(s) being developed.

B.2 Annex B purpose

Annex B provides for the SSR the corresponding content contained in Clause 5, Clause 6, and Clause 7 of this standard for the reviews covered in those clauses.

B.3 Annex B tailoring

If a specific program requires an SSR, Annex B content changes status as defined in B.4.

B.4 Application of Annex B content

For programs that require an SSR, the content of B.5, B.6, and B.7 assume the status and are applied as listed in Table B.1.

Table B.1—Annex B content status and application

Annex B subclause	Content status	Application
B.5	Becomes normative	Is a normative addition to Clause 5 of this standard.
B.6	Becomes normative when tailored	Is a normative addition to Clause 6 of this standard as tailored for the program.
B.7	Remains informative	Is added as application guidance to Clause 7 of this standard.

B.5 Requirements for an SSR

B.5.1 SSR purpose

The SSR shall be conducted to help ensure the software requirements baseline of the system element(s) under review is sufficiently mature and stable to support a reasonable expectation that the preliminary design and ultimately the software solution will be judged operationally effective and suitable.

B.5.2 SSR description

The SSR shall confirm that

a) All system requirements allocated to software have been decomposed and allocated to the lowest level of the software logical architecture.

b) Bi-directional traceability exists between the allocated software requirements and the set of source documents, including the system specification and the CDD.

c) All allocated software functional, performance, non-functional, interface, and statutory and regulatory requirements form an acceptable basis to enable completion of the software preliminary design within program budget, schedule, and risk targets.

d) All allocated requirements have verification methods that are defined, documented and agreed upon.

e) The software requirements specification(s) (SRS), software IRS, preliminary software integration plan, preliminary user documentation descriptions, and the concept of operations (CONOPS) description form a satisfactory basis to help ensure successful completion of the preliminary software design.

B.5.3 SSR timing

The SSR shall be held between the system functional review (SFR) and the system preliminary design review (PDR), following full system functional definition at SFR, and when the acquirer and supplier agree that the software requirements baseline is sufficiently complete and stable to support a successful SSR.

B.5.4 SSR entry criteria

The SSR shall be conducted only after the following events have been successfully completed:

a) The acceptability criteria for each of the SSR technical review products have been established for the specific program by tailoring the contents of Table B.2.

b) All preparatory actions in Table B.3 as tailored for the specific program have been successfully accomplished to support conducting the technical review.

c) All documentation in support of SSR has been completed to the degree to satisfactorily support SSR.

d) The system requirements review (SRR) and SFR have been completed and their action items closed.

B.5.5 SSR content

B.5.5.1 Products to be reviewed at SSR

The following work products at a minimum shall be reviewed by the SSR team. Other products may be added as necessary during tailoring of Table B.2 for the specific program.

a) Software technical documentation
b) Technical plans
c) Program execution and process control
d) Risk assessment
e) Program cost and schedule estimates

B.5.5.2 Conduct of the SSR

SSR participants shall assess the SSR work products and judge the products' acceptability according to the applicable criteria in Table B.2 as tailored for the specific program.

B.5.5.3 SSR outputs

a) Key SSR outputs shall include the following:

   1) An approved allocated software requirements baseline that is complete, consistent, and includes all required categories of software requirements (functional, performance, non-functional, interface, and statutory and regulatory)
   2) A complete and consistent allocation of all software requirements with bi-directional traceability between the allocated requirements and the source requirements documents
   3) Technical plans that are current and address the full scope of work
   4) A software development plan (SDP) that adequately addresses the software-specific acceptability criteria in the tailored Table B.2 technical plans subclause
   5) An updated (if necessary) risk and opportunity assessment, and associated risk mitigation and opportunity handling plans
   6) An SSR team determination that the software requirements baseline, supporting documentation, and program resources form a satisfactory basis for proceeding
   7) Official, approved SSR minutes incorporating at a minimum the following items as part of the official record:
      i) All specifications, descriptions, plans, and analysis reports that were reviewed by the SSR team
      ii) A complete list of SSR attendees
      iii) Completed action item forms
      iv) Review results for each of the work product categories assessed during the technical review
      v) Configuration identification documentation that completely defines the software requirements baseline that is the object of the SSR work products

b) The SSR technical review summary report shall be distributed containing the following attachments:

   1) Final copies of all presentations
   2) Updated risk assessment and mitigation plans
   3) Documented action items including those required for closure
   4) The tailored SSR detailed criteria tables as completed following the technical review
   5) Meeting minutes

B.5.6 SSR exit criteria

The SSR shall be deemed completed only after the following events have been successfully completed:

a) All action items submitted during the technical review have been appropriately resolved.
b) All actions listed in the action items required for closure have been completed and approved by the required parties.
c) The content of corrective action plans, if any, for issues identified in the SSR is sufficiently complete and unambiguous to enable successful completion of all corrective actions.
d) Each of the technical review products listed in Table B.2 as tailored for the specific program meets all of its acceptability criteria, or has a corrective action plan documenting the corrective actions required to achieve acceptability.

e) The acquirer and supplier concur that the risk level is acceptable.

f) All baselines in the applicable configuration management (CM) system(s) are current and consistent with the audited SSR work products.

g) The SSR chair formally closes the review.

B.6 SSR detailed criteria

B.6.1 SSR technical review products acceptance criteria

Table B.2 lists the products that should be reviewed at SSR, and the associated acceptability criteria that should form a sufficient basis by which to assess each product's content as acceptable to support a successful SSR. If a given program requires an SSR, specific products and associated acceptability criteria shall be deleted, modified, or additional items included, in accordance with the acquirer-supplier agreement, to support a given program.

Table B.2—SSR technical review products acceptability criteria

Product	SSR acceptability criteria
Software technical documentation	a) The software requirements baseline is complete, stable and under configuration control. b) The software's low-level performance requirements have been evaluated and determined to be consistent with the system CONOPS. c) Bi-directional traceability exists between all allocated software requirements at the lowest level and the source requirements documents. d) All allocated software requirements have verification methods defined, documented and agreed upon between the acquirer and supplier, and the traceability between the requirements and their verification methods is contained in the verification cross reference documentation. e) The software analysis and allocation process has accounted for the required interaction(s) between the software functionality and performance and the applicable hardware items and their associated interface control documents, and the corresponding software interface requirements are captured in the software interface requirements documentation. f) Critical program information (CPI) protection and any required anti-tamper requirements applicable to software have been included in the allocated software requirements. g) Open architecture requirements applicable to software have been included in the allocated software requirements. h) Cybersecurity requirements applicable to software have been included in the allocated software requirements. i) Any declassification requirements for classified information stored in computer or electronic data storage systems that are applicable to software have been included in the allocated software requirements. j) Any logistics support requirements applicable to software have been included in the allocated software requirements. k) Any certification requirements applicable to software have been included in the allocated software requirements. l) Software requirements for M&S have been included in the allocated software requirements. m) Safety-critical software element(s) have been identified as applicable and have been included on the program's critical safety item (CSI) list.

Product	SSR acceptability criteria
Technical plans	a) The SDP has been updated as required by the results of the software requirements analysis and allocation process. b) The software engineering environment (SEE) has been defined in the SDP and is sufficient to support the program's planned software development life cycle. c) A draft software test plan (STP) exists that will enable scheduling of test facilities and ensure availability of test resources. d) The Test and Evaluation Master Plan (TEMP) has been updated as required by the results of the software requirements analysis and allocation process. e) A draft software integration plan has been completed and defines the verification(s) planned at each integration step.
Program execution and process control	a) The CCB is processing configuration changes in accordance with industry standards, supplier instructions, processes and procedures, and maintaining the proper configuration baselines. b) Changes to the software requirements baseline are made only through a formal change process that assesses the cost, schedule, technical performance, and resources impacts of the change, and the change process is managed by the CCB. c) Any changes made to the requirements since the SFR are documented in the configuration status accounting records. d) Any safety-critical software element(s) have been addressed in the program's system safety plan. e) The quality assurance plan has been updated to include all required software quality assurance and quality engineering requirements.
Risk assessment	a) Technical risks are identified, and mitigation plans are in place. b) Risk management process is in place demonstrated by documented execution results of existing mitigation plans associated with the purpose of the review.
Program cost and schedule estimates	a) Preliminary software development estimates have been established with effort, schedule and cost analysis. b) Updated cost estimate fits within the existing budget. c) Software schedule items have been integrated into the integrated master schedule (IMS) with critical path dependencies identified.

B.6.2 SSR preparation

Table B.3 lists the actions that should be considered during preparation for the SSR. The responsible people listed are those most often tasked with the listed preparation actions, but the acquirer and supplier may agree to assign the actions to different people or organizations depending on a given program's organizational structure. If a given program requires a SSR, the specific actions shall be deleted, modified, or additional items included, in accordance with the acquirer-supplier agreement. If a given program requires a SSR, responsibilities shall be assigned to people or organizations in accordance with the acquirer-supplier agreement.

Table B.3—SSR technical review preparation actions

Responsible person	SSR preparation actions
Program manager	a) Approve, fund, and staff the SSR as planned in the Systems Engineering Plan (SEP) developed by the systems engineer. b) Appoint an SSR chair no later than 45 days prior to the technical review, in coordination with the systems engineer and program lead software engineer. c) Coordinate a preliminary agenda between the program IPT and other acquirer subject matter experts (SME) no later than 30 days prior to the SSR.
Systems engineer	a) Ensure adequate plans are in place to complete the technical activities to proceed from SSR to PDR. b) Ensure any changes to the requirements since SFR are documented in the SSR presentation material. c) Ensure verification methods are identified for all requirements. d) Ensure risk items associated with the functional requirements are identified and analyzed, and mitigation plans are in place. e) Ensure all of the technical review products whose acceptability criteria are defined in Table B.2 are completed for the SSR.
Program lead software engineer	a) Coordinate arrangements for SSR location and support. b) Coordinate requirements for the SSR chair with the systems engineer and program manager. c) Coordinate the preliminary SSR agenda with the systems engineer and program manager. d) Ensure the preparation of all presentation material is coordinated across IPTs.
SSR chair	a) Determine SSR team membership. b) Approve the final SSR agenda. c) Identify any specific elements for in-depth technical review as required.

B.6.3 SSR conduct

Table B.4 lists the technical review elements and associated content details that should be considered for the conduct of the SSR. If a given program requires an SSR, specific elements and their content details shall be deleted, modified, or additional items included, in accordance with the acquirer-supplier agreement, to support a given program.

Table B.4—SSR conduct elements

SSR review element	Content details
Introduction, agenda, administrative	a) Review location layout and safety procedures b) Security procedures if applicable c) Introduction of SSR chair and team members d) SSR agenda e) Action item procedures f) Purpose of the technical review
Software program overview	a) Schedule b) Measures and metrics c) Software risks d) Software life-cycle support concept e) Changes to requirements since SFR
Software technical documentation review	a) Functional overview of the software elements including inputs, processing, and outputs of each function b) Overall performance requirements of each element including execution time, storage requirements, and similar constraints c) Architectural overview of the system and software elements d) Expected software criticality level for each software element e) Expected classification level for each software element if applicable, and declassification requirements f) Control flow and data flow at the architectural level for each of the software functions g) Quality factor requirements (i.e., correctness, reliability, efficiency, integrity, usability, maintainability, testability, flexibility, portability, reusability, and interoperability) h) All interface requirements among the software elements, and among all other system elements and interfaces external to the system i) Verification matrix or other documentation that identifies applicable verification levels and methods for all requirements allocated to the software element(s) j) Any special delivery or installation requirements k) Mission requirements of the system and how the software element(s)' functionality supports it l) Operational and support requirements for the software element(s) m) Functions and characteristics of the computer system(s) within the overall system n) Updates since the previous technical review to all previously delivered technical documentation
Technical plans review	a) Structure and content of the SDP b) Structure and content of the quality assurance plan c) Structure and content of the TEMP d) Any actions or procedures deviating from approved plans

SSR review element	Content details
Program execution and process control review	a) Details of the SEE including physical facilities, development computer resources, target system computing resources, software development tools, and models b) Details of any other development, integration and test facilities involved in the system software development, integration, verification, production, and life-cycle support c) Structure and operation of the CCB
Risk assessment review	a) Risk identification and mitigation including consideration of software technical risks and development execution risks
Program cost and schedules review	a) Updated program cost estimates with respect to current software development budget b) Software milestone schedules c) Inclusion of software milestone schedule events in the IMS and critical path events

B.6.4 SSR closure

Table B.5 lists the actions that should be considered for SSR closure. The responsible people listed are those most often tasked with the listed closure actions. The acquirer and supplier may agree to assign the program manager and systems engineer actions to different people or organizations depending on a given program's organizational structure. If a given program requires a SSR, the specific actions shall be deleted, modified, or additional items included, in accordance with the acquirer-supplier agreement. If a given program requires a SSR, responsibilities shall be assigned to people or organizations in accordance with the acquirer-supplier agreement.

Table B.5—SSR closure actions

Responsible person	SSR closure actions
Program manager	a) Manage and approve changes to technical baselines resulting from SSR. b) Support development of the SSR summary report. c) If funding profiles are insufficient to support development, notify user/sponsor of funding shortfall, and request funding profile adjustments.
Systems engineer	a) Organize and supervise the responses to all action items generated during SSR. b) Support development of the SSR summary report.
Program lead software engineer	a) Organize and supervise the detailed documentation of all action items assigned during the SSR b) Support development of the SSR summary report.
SSR chair	a) Ensure preparation of the SSR summary report with the support of the program manager, systems engineer, and program lead software engineer. b) Sign off final approval of all action items. c) Prepare the formal SSR completion letter.
Recorder	a) Collate all action items for submission to the SSR chair. b) Prepare the SSR summary report and SSR minutes for signature and distribution by the SSR chair. c) Prepare the SSR closure letter for signature by the SSR chair.

B.7 SSR application guidance

The following is a set of observed good practices for consideration:

a) Acquisition programs that have an incremental software development approach should conduct an SSR for each increment.

b) The scope of the SSR should be tailored to be consistent with the technical scope of the overall program.

c) The request for the SSR chair should occur at least 60 days prior to conduct of the technical review.

d) It is helpful if the SSR is conducted as a buildup technical review to PDR, and the content requirements of the SSR should be considered as prerequisites for the system-level PDR.

e) The program's software lead engineer should conduct subsystem- or lower-level technical interchange meetings (TIM) to review requirements maturity and readiness for SSR, to establish completeness of documentation, adjudicate requirements disagreements, and to ensure SSR presentation material accurately represents the status of the software effort.

f) The lower-level TIMs should begin at least 60 days prior to SSR.

g) Problems identified during the lower-level TIMs should be resolved prior to SSR rather than be documented as issues during SSR.

h) Any SSR presentation material required for program or software certification(s) should be provided to the applicable certification authorities as early as possible in order to provide sufficient time for those authorities' analysis to judge the certification status by the time of the SSR.

i) In order to help ensure a comprehensive and balanced assessment of all SSR work products, SSR participants from both the acquirer and supplier should include the following, as applicable:

    1) Program management
    2) Configuration management
    3) Systems engineering
    4) Software engineering
    5) System safety
    6) Logistics
    7) Test and evaluation
    8) All certification authorities
    9) System users
    10) Cost estimating team
    11) Legal counsel, if required
    12) Contracting officers
    13) Recorder or secretary

    NOTE—These roles do not dictate that a single individual is provided for each role. A single individual may perform more than one of these roles within the team. Depending on the complexity of the system, more than one individual may also be assigned to a specific role.