ASN(RD&A)

Software Criteria and Guidance for Systems Engineering Technical Reviews (SETR)

Supplement to Guidebook for Acquisition of Naval Software Intensive Systems

Office of the Assistant Secretary of the Navy
(Research, Development and Acquisition)

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Supplement to Guidebook for Acquisition of Naval Software Intensive Systems

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Software Criteria and Guidance for Systems Engineering Technical Reviews (SETR)

Executive Summary

This supplement to the *Guidebook for Acquisition of Naval Software Intensive Systems* provides guidance on software-centric criteria at use during SETR events. The criteria are for use by program management offices (PMO) and technical authorities, regardless of Acquisition Category (ACAT), at all SETR reviews chosen by the PMO as reflected in the approved System Engineering Plan (SEP) or equivalent.

This supplement adds accountability to the policy and practices conveyed in the *Guidebook for Acquisition of Naval Software Intensive Systems;* and was developed based on the SETR guidance in the *Naval Systems Engineering Technical Review Handbook.* The software criteria were developed by software acquisition subject matter experts from across the Naval Systems Commands (SYSCOMs) and Program Executive Offices (PEO), along with external subject matter experts. The information in this supplement represents SYSCOM best practices validated with the with Institute of Electrical & Electronics Engineers/Electronic Industries Alliance (IEEE/EIA) standards that the Navy has adopted for software development. The development team also worked with functional area leaders from interoperability, information assurance, and safety to provide criteria inclusive of their concerns and practices.

This supplement contains listings of the core software metrics and Navy enterprise-wide software artifacts with their maturity (see Table 2, Table 3, and Enclosure 2) with criteria statements for SETR events applicable to software intensive systems (see Enclosure 1 for a listing of the SETR events and Enclosures (4) through (8) for the criteria statements). Section 7 of this supplement provides guidance on tailoring of the artifacts and criteria statements to match system complexity and risk level.

1. Background

The Assistant Secretary of the Navy for Research Development and Acquisition (ASN (RD&A)) commissioned a Software Process Improvement Initiative (SPII) in 2006 under the cognizance of the ASN (RD&A) Chief Systems Engineer (CHSENG). CHSENG established five SPII teams to focus on functional areas for potential process improvements. The resulting process improvements and associated ASN (RD&A) policies are captured in the *Guidebook for Acquisition of Naval Software Intensive Systems* issued in September 2008.

In order to implement and more completely institutionalize software process improvement, a Cross-SYSCOM Software Working Group (SWWG) was established by CHSENG to address enterprise wide software acquisition issues. SWWG membership included software acquisition subject matter experts (SMEs) from the SYSCOMs and PEOs, augmented by SMEs appointed by the CHSENG. The SWWG provided SME reviews to support the development of software criteria for the Probability of Program Success (PoPS) methodology to assess software health in support of the SECNAVINST 5000.2D (2 Pass/6 Gate reviews). These criteria were associated with and based on the four core software metrics discussed in Chapter 2 of the *Guidebook for Acquisition of Naval Software Intensive Systems* and mandated by ASN (RD&A) policy (see Appendix D of the *Guidebook* for the policy memorandum dated July 22, 2008).

The SWWG was then tasked in 2009 to generate a software-focused supplement to the *Guidebook for Acquisition of Naval Software Intensive Systems* which would provide an enterprise approach for software evaluations within the Systems Engineering Technical Review (SETR) framework, maintain consistency within the overall framework of common SETR and technical authority policies and processes detailed in the *Naval Systems Engineering Technical Review Handbook,* and support linkage to the SPII focus team products, the SECNAVINST 5000.02D (2 Pass/6 Gate) review process, and the PoPS methodology.

A SETR assessment involves a number of Technical Interchange Meetings (TIMs) as part of the work-up to the SETR event (see section 7.3 of the *Naval SETR Handbook).* Technical Review Board (TRB) members have a number of responsibilities during the TIMs. Among them are to discuss technical issues relevant to the health of the program and its supporting documentation, identify potential Request for Action (RFA)/Request for Information (RFI) submissions, and identify/prioritize recommendations to program management. See section 8.0 of the *Naval SETR Handbook* for a full description of the RFA/RFI process.

The SETR software criteria presented in this supplement were prepared by the SWWG for program office staffs and technical authorities to enhance their use of enterprise-wide best practices in software system development. Enclosure (1) shows the list of SETRs from the *Naval SETR Handbook* that were deemed applicable enterprise-wide to software-intensive systems.

2. Methodology

The Navy software SETR criteria were developed by the SWWG by consolidating software-centric artifacts (i.e., software documents and other software related products) based on policies, standards, and best practices from MARCORSYSCOM, NAVAIR, NAVSEA, and SPAWAR. These 'artifacts' are the software work products developed across the acquisition lifecycle. The SWWG found while crafting the enterprise-wide list of artifacts that the artifacts varied by type and level of detail across the SYSCOMs. The SWWG developed a list of artifacts which were common across the SYSCOMs and reflected their best practices. In some cases the artifacts are required by policy (such as the Software Development Plan (SDP)). In other cases they represent sound practices that existed at the SYSCOM level. The criteria development process also included a consideration of other (non-artifact) sources, including the four core software metrics. Figure 1 illustrates the SWWG process that was followed. All artifacts and core software metrics were validated and aligned with Institute of Electrical & Electronics Engineers/Electronic Industries Alliance (IEEE/EIA) Standard 12207.0, with IEEE/EIA Standard 1058, and as mentioned above, with current Navy standards for SECNAVINST 5000.2D (2 Pass / 6 Gate reviews) and the PoPS methodology. See section 6.3 of the *Guidebook for Acquisition of Naval Software Intensive Systems* for an overview of how IEEE/EIA Standard 12207.0 is applied to DoN acquisition of software intensive systems.

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This supplement to the *Guidebook for Acquisition of Naval Software Intensive Systems* provides a structured set of software criteria statements to be used by software acquisition personnel and technical authorities. These criteria statements provide enterprise-wide guidance in verifying the health and maturity of software and associated software engineering tasks during SETR events, ensuring that they have been completed successfully. The criteria were designed to evaluate software development efforts leading to the software-intensive system end-product of the Engineering and Manufacturing Development (EMD) phase of the acquisition lifecycle, the integration of software with the overall system, and the readiness for transition from acquisition to life cycle support. These criteria do not, at this time, cover criteria for prototyping efforts for software Critical Technology Elements (CTEs) during the Technology Development phase of acquisition. This issue is under study by ASN(RD&A) and the SWWG with plans to develop and document appropriate criteria as an update to the criteria presented in this supplement. See section 7.5 of this supplement for information on tailoring current software SETR criteria for software prototyping efforts.

The criteria statements are organized according to their sources, which are:
- Software Artifacts
- Core Software Metrics
- General (non-Artifact/non-Metric) Health Indicators

Criteria Statement Development Process Overview

*R*DA *C*HIEF *S*YSTEMS *E*NGINEER

What Needs To Be Evaluated

- Software artifacts
  - Critical element(s) by review
- Mandated 4 core software metrics
- System artifacts

Existing Software Criteria Statements

- SYSCOM(s) Body of Work
- DAU
- PoPS Metrics
- …

Don't reinvent the wheel

Enterprise SETR Software Criteria Statements

Draft set of criteria statements per SETR event

↓

List refinement

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Final Criteria in *Supplement to Guidebook for Acquisition of Naval Software Intensive Systems*
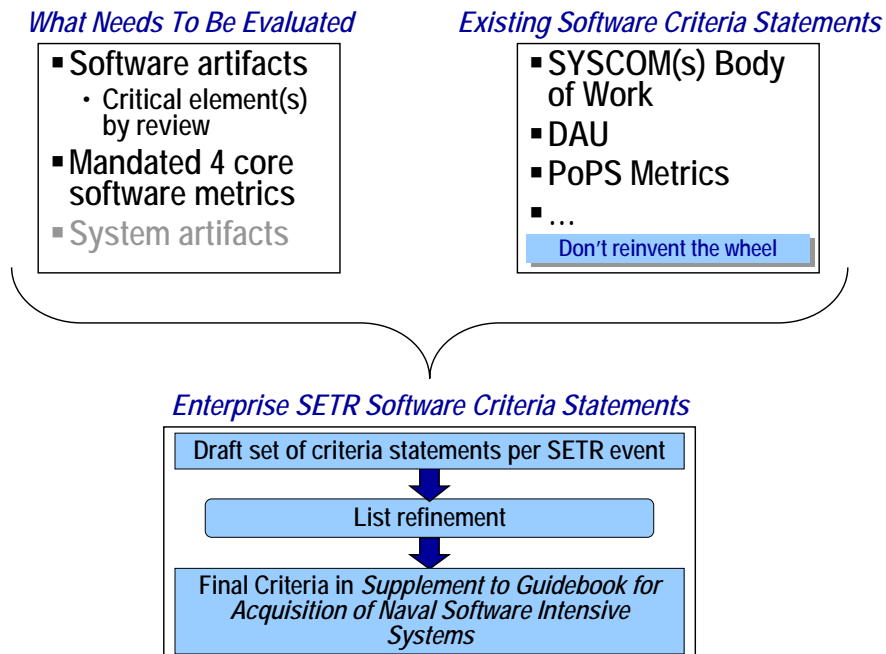
Figure 1 - Process used to develop criteria statements

The SWWG recognized that not all criteria were equally important to program health and risk, and that one responsibility of the TRB is to identify issues that could prevent closure of the SETR assessment or items

that need program office visibility for follow-up. The SWWG scored all criteria to provide an enterprise view of which criteria, if not satisfied, should trigger an RFA, as shown in Table 1.

Table 1. Description of scoring for SETR criteria statements

Score	Description
1	<u>Crucial</u> to software health and system risk. A criterion scored as '1,' if not satisfied, should trigger a Critical RFA at a SETR review.
2	<u>Important</u> to software health and system risk. A criterion scored as '2,' if not satisfied, should trigger a Non-Critical RFA at a SETR review.
3	<u>Valuable</u> to software health and system risk. A criterion that is useful at a system SETR, but would not trigger RFAs on its own if not satisfied.
4	<u>Retain</u> for future use. The criterion is a candidate for use at software item reviews, could be tailored to the needs of a particular system, or is not an enterprise-wide item.

3. Document Structure

Section 4 provides information on the software artifact-based criteria. It describes the software artifacts, their elements and maturity, and the criteria statements:

- Artifacts are documents and other work products that are developed during the acquisition lifecycle.
- Elements describe the content of each artifact and are essentially a 'table of contents' list for each artifact.
- Maturity refers to the state of preparation and configuration management for each artifact through the development lifecycle. Artifacts can be in Draft, Final, or Updated status at a given SETR event.
- Criteria statements provide the questions or statements by which the artifact is evaluated.

Section 5 identifies the four core software metrics and presents the criteria statements associated with assessing metrics-related software health at each SETR event. The core software metrics are mandated across the entire software development lifecycle by ASN (RD&A) policy, and link directly to Probability of Program Success (PoPS) evaluations at gate reviews. Section 6 provides the SETR criteria statements for the general software health indicators. Some information on tailoring software SETR criteria is found in Section 7 of this supplement.

4. Software Artifacts

4.1 Software Artifact Identification and Governance

Enclosure (2) provides a listing of the artifacts, along with their governing policy, guidance, standards, and information on artifacts that are required by policy. The process used to develop this artifact list is described in Section 2 to this supplement. Enclosure (3) provides a listing of the elements that describe the content of each artifact.

4.2 Software Artifact Maturity Schedule

Program artifacts are produced throughout the acquisition lifecycle and a schedule for their maturity is provided in Tables 2 and 3 of this supplement. In general, most of the artifacts produced before Milestone-B are initially generated by the Government (some with contractor support). The contractor/ developer becomes responsible for the creation of most of the artifacts in the Engineering and Manufacturing Development (EMD) phase of the acquisition (SETR event PDR2 (post-Milestone B) and events which follow).

Tables 2 and 3 document a "best practice" schedule for producing and reviewing the software centric artifacts identified in Enclosure (2), along with the entity (government or developer) typically responsible for creation and maintenance of the artifacts. Table 2 documents the schedule leading up to Milestone B and the release of the EMD Request for Proposal (RFP) to build the system. Table 3 documents the artifact maturity schedule after Milestone B. Not all programs will hold all the SETR events detailed in this supplement. The program System Engineering Plan (SEP) will typically detail how the SETR events will be tailored for the individual program's needs, and some information on tailoring is found in Section 7 of this supplement.

Tables 2 and 3 also indicate the SETR events for which criteria were developed. These are the 'essential' SETR events given in Section 5.2 of the *Naval SETR Handbook*, with the addition of SSR (Software Specification Review) and IRR (Integration Readiness Review). Both SSR and IRR can provide critical, key event-driven occasions for software assessment in the development of complex systems. SSR is designed to review the completeness of the software specification, while IRR assesses the readiness of software for system-level testing.

The terms Draft, Final, and Update describe the stages in the development of an artifact. In this context, the meaning of the terms is as follows:
- Draft: In most cases, Draft (D) denotes the first time an artifact appears at a SETR event. An artifact designated with a 'D' at a given SETR must also be available at all subsequent SETR events in the same or improved condition.
- Update: Update (U) designation is optional, and may occur more than once. Each time it occurs, it signifies that some sort of improvement-related change to the Artifact is expected. The Update designation can follow either a 'D' or an 'F' designation.
- Final: The Final (F) designation must occur once and only once, and denotes that the artifact is under configuration management control. The 'F' designation occurs at a SETR event subsequent to its 'D' designation, if the Artifact has a mandated Draft.

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Table 2. Pre-Milestone B Software-Centric Artifact Maturity Schedule

Enclosure/Page refers to the location within this supplement of the artifact description
and SETR event criteria statements related to that artifact

Artifact	Encl / Page	Created By	ITR	ASR	SRR1	SRR2	SFR	SSR	Pre-MS B PDR
Measurement Plan	4 / 2	Gv		D	F	U	U	U	
Software Risks/ Mitigation Plans	6 / 11	Gv then Dev			D	F	U	U	U
Software Acquisition Management Plan (SAMP)	4 / 4	Gv				D	F	U	U
Computer Software Configuration Items (CSCIs)	6 / 2	Gv then Dev					D (by Gv)	U	U
Software Requirements Description (SRD)	6 / 4	Gv or Dev						D (if Gv)	U (if Gv)
Software Requirements Traceability Matrix (RTM)	6 / 5	Gv then Dev							D (by Gv)
Software Life Cycle Sustainment Plan (LCSP)	6 / 3	Gv then Dev							D

Gv = Government   Dev = Developer   D = Draft   F = Final   U = Update

Table 3. Post-Milestone B Software-Centric Artifact Maturity Schedule

Enclosure/Page refers to the location within this supplement of the artifact description
and SETR event criteria statements related to that artifact

Artifact	Encl / Page	Created By	Post_MS B PDR	CDR	IRR	TRR	SVR	PRR
Measurement Plan	4 / 2	Gv	U					
Software Risks / Mitigation Plans	6 / 11	Gv then Dev	U (by Dev)	U (by Dev)	U (by Dev)	U (by Dev)	U (by Dev)	
Computer Software Configuration Items (CSCIs)	6 / 2	Gv then Dev	U (by Dev)	F (by Dev)				
Software Requirements Description (SRD)	6 / 4	Gv or Dev	D/U (if Dev/Gv)	F (by Dev)	U (by Dev)	U (by Dev)	U (by Dev)	
Software Requirements Traceability Matrix (RTM)	6 / 5	Gv then Dev	U (by Dev)	F (by Dev)	U (by Dev)	U (by Dev)		
Software Architecture Description (SAD)	5 / 3	Dev	D	F	U	U	U	
Software Build Plan	5 / 5	Dev	D	F	U	U		
Software Design Description (SDD)	5 / 6	Dev	D	F	U		U	
Prime/Subs Software Development Plan (SDP)	5 / 8	Dev	F [1]	U				
Software Interface Design Description (SIDD)	5 / 15	Dev	D	F	U		U	
Software Test Plan (STP)	5 / 18	Dev	D	F				
System/Software Integration Plan	5 / 20	Dev	D		F			
Test Procedures/ Scripts/Cases	5 / 22	Dev		F	U			
Operator Guide / Users Guide	5 / 2	Dev			D	U		F
Software Product Baseline	5 / 16	Dev			D	U		F
Test Problem / Trouble Report	6 / 14	Gv and Dev			D	U		F
Software Life Cycle Sustainment Plan (LCSP)	6 / 2	Gv then Dev					F	U

Gv = Government   Dev = Developer   D = Draft   F = Final   U = Update

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[1] Navy policy for acquisition of software intensive systems requires that a Software Development Plan (SDP) be submitted by the developer in draft form in response to the Request for Proposals. See sections 7.4.1, 8.1.1, and Appendix E of the *Guidebook for Acquisition of Naval Software Intensive Systems* for information on the requirements for an SDP, its role in the software acquisition effort, and the flexibilities available to acquisition officials when tailoring the SDP to the needs of the program.

4.3 Software Artifact Based Criteria

The SWWG developed a set of criteria based on the artifacts listed in Enclosure (2). The criteria are the enterprise-wide software criteria necessary to evaluate software maturity and contributions to program health and risk and verifying software engineering tasks have been successful.

The criteria are displayed by artifact in Enclosure (4) through (6). For each artifact, the enclosure provides the artifact description, creator, SETR events for which criteria apply, maturity schedule as discussed in Section 4.2, score as described in Section 2, and criteria statements. The table also includes a unique ID number for each criteria statement, created by the SWWG as an aid to tracking and discussing criteria. The element name for which the criteria statement applies is useful to track how criteria statements mature through the acquisition lifecycle, and also trace how related criteria change in scoring between SETR events. Criteria statements are provided for only those elements necessary to evaluate software maturity and status of software engineering tasks. Enclosure (3) provides a listing of elements for each artifact.

5. Core Software Metrics

5.1 Metrics Applicability

As discussed in Chapter 2 of the *Guidebook for Acquisition of Naval Software Intensive Systems,* the core metrics are mandated across the entire software development lifecycle by ASN (RD&A) policy (see Appendix D of the *Guidebook* for the policy memorandum dated July 22, 2008). They are to be defined, gathered, analyzed, reported, and used to assess software health during all phases of the acquisition; and as such, they are "always applicable" and do not follow the same "maturity schedule" concept as the software artifacts described in Section 4.2.

The core metrics are not documents to be developed and controlled. These items will not go through Draft, Final, and possible Update phases. Rather, they are generated on numerous occasions for individual SETR events. The metrics based criteria are therefore tagged as Applicable (A) for any and all SETR events at which they are assessed, and do not have the D/F/U designations. The core metrics are assessed at all SETR events. While there are no artifact-based criteria at PCA, the core metrics evaluate the readiness for transition from acquisition to sustainment.

5.2 Metrics Based Criteria

Enclosure (7) provides the metrics based criteria statements. The core metrics are relational across the acquirer and developer organizations. They are updated at each SETR with criteria that reflect the changing nature of software acquisition across the lifecycle and they tie to PoPS software metrics criteria statements that are part of the SECNAVINST 5000.2D (2 Pass/6 Gate) process. See the ASN (RD&A) policy memorandum dated May 12, 2010 for PoPS materials and their role in assessments of program health.

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6. General Software Health Indicators

6.1 Health Indicator Applicability

The general health indicators are best practices and are not documents to be developed and controlled. These items will not go through Draft, Final, and possible Update phases. Rather, they are indicated on numerous occasions for individual SETR events. The criteria associated with general health indicators are tagged as Applicable (A) for any and all SETR events at which they are assessed, and do not have the D/F/U designations. General software health indicators are listed at key SETR events.

6.2 General Health Indicator Based Criteria

Enclosure (8) provides general health indicator criteria. These criteria are indicators of general software development health and software development risk, and span across several artifacts and/or core software metrics. They will be most useful at the Technical Warrant Holder level.

7. Tailoring Guidance

The *Naval SETR Handbook* gives the Milestone Decision Authority (MDA) the authority to allow program managers to tailor SETRs to match system complexity or risk level. This may involve actions such as merging SETRs for non-complex systems, decomposing SETRs into incremental events for complex systems, or moving SETRs relative to each other or to the MDA milestones. In addition, program circumstances may dictate software artifacts different from the standard software artifacts of IEEE/IEA 12207 or Navy best practice assumed by this supplement. This section provides tailoring guidance for the SETR criteria identified in Enclosures (4) through (8), covering software artifacts, core metrics, and general health indicators.

7.1 Tailoring of Artifacts and Elements

While Navy acquisition policy for software intensive systems states that "there is no requirement that the specific IEEE/EIA Standard 12207.1 documents need to be created," it does require that "their information content must be provided in some format, as appropriate, for the proposed work effort." [2]

The SETR criteria for software artifacts documented in Enclosures (4) through (6) are based on the artifacts and artifact elements discussed in IEEE 12207 or by Navy enterprise "best practice" (see Enclosures (2) and (3) for the artifact and element lists). If a system development effort calls for the creation and delivery of artifacts and/or elements different from those identified in the enclosures, the criteria should be tailored to apply to those artifacts to be created that will provide the equivalent information.

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[2] The Department of the Navy policy memorandum dated September 16, 2008 is found in Appendix E to the *Guidebook for Acquisition of Naval Software Intensive Systems*. The policy memorandum discusses adoption and mandated use of IEEE/EIA 12207 as the standard life cycle framework, the use of standard contract language, the requirement that offerors submit a Software Development Plan as a CDRL, measurement and metrics, and the functional disciplines required to ensure sound application of modern software technologies.

7.2 Merging or Separating SETRs

The SETR criteria for software artifacts and core metrics are grouped by SETR within the artifact or metric in Enclosures 2 through 5. This should facilitate tailoring criteria, if SETRs have been merged (e.g., a single SRR is scheduled rather than the recommended two) or separated (e.g., multiple CDRs are scheduled to address subsystems of a complex system or system-of-systems). Merging or separating SETR events may be appropriate based on system complexity and/or incremental builds/system development, and will be documented in the tailored SETR schedule in the Systems Engineering Plan (SEP) as required by the *Naval SETR Handbook*.

When tailoring the occurrence of SETR events, the level of the reviews should be addressed and characterized. For example, there may be multiple incremental reviews for multiple builds, but these reviews may be at a lower level of detail, not requiring top-level attention. The program office should carefully describe in their SEP the relationship of top-level reviews and lower-level reviews to facilitate an effective strategy. When SETR events are tailored, engineering judgment should be used to eliminate criteria reflecting lesser artifact maturity or to reword criteria to reflect correct artifact maturity for the given SETR.

7.3 Moving SETRs

If SETRs are reordered, relative to each other, or are moved to the other side of an assumed MDA milestone (such as from pre-MS B to post-MS B), all criteria associated with artifacts, metrics, or general software health associated with the SETR, or SETRs, impacted should be reviewed and tailored, as appropriate, to accommodate the actual system development schedule. Documentation of the tailored SETR schedule in the SEP is required by the *Naval SETR Handbook*.

7.4 Tailoring an Artifact's Schedule or Creator

If the schedule of an artifact (Draft, Final, or Update) differs from that shown in Tables 2 or 3 (the draft SRD is scheduled for the pre-MS B PDR rather than SFR, for example), the SETR criteria for the artifact should be tailored, as appropriate, with respect to the actual artifact schedule. If the creator of an artifact will be different than the one indicated in Tables 2 or 3 (for example, the Government instead of the Developer) all criteria associated with the artifact should be tailored appropriately to reflect the new creator.

7.5 Tailoring for Software Prototyping Efforts

DoD and Naval policies (DoDD 5000.01, DoDI 5000.02, and SECNAVINST 5000.2D) require that Program Managers reduce technology risk by demonstrating critical technology prior to program initiation. DoDI 5000.02 requires that Critical Technology Elements (CTEs) be identified and assessed during the Material Solution Analysis phase of Acquisition, then prototyped and demonstrated in a "relevant environment" during the Technology Development phase.

The software SETR criteria contained the Enclosures (4) to (8) of this supplement do not, at this time, cover criteria for the identification, development, demonstration, and assessment of software CTE-related

prototypes during these early phases of Acquisition. This issue is under study by ASN(RD&A) and the SWWG with plans to develop and document appropriate criteria. In the interim, for those programs facing the issue of reviewing technical maturity of software CTE prototyping efforts at SETRs, the following tailoring guidance is offered:

- Criteria from the late Technology Development SETRs (SSR, SFR, and Pre-MS B PDR) and early Engineering & Manufacturing Development SETRs (Post-MS B PDR, CDR, IRR) may be appropriate, with revision, for assessing the health and maturity of software CTEs/prototypes and prototyping tasks.

- As CTEs are identified during Material Solution Analysis and prototyped during Technology Development, the revised criteria should be added to existing criteria for the Material Solution Analysis and early Technology Development SETRs (ITR, ASR, SRR1, SRR2, and SFR).

References

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Operation of the Defense Acquisition System, DoD Directive 5000.01 (May 12, 2003, Current as of November 20, 2007)

List of Acronyms

A .... Applicable (in reference to maturity of an artifact)
ACAT .... Acquisition Category
AoA .... Analysis of Alternatives
ASN (RD&A) .... Assistant Secretary of the Navy for Research, Development, and Acquisition
ASR .... Alternative System Review
CDD .... Capability Development Document
CDR .... Critical Design Review
CHSENG .... Chief Systems Engineer
CI .... Configuration Item
CLS .... Contractor Logistics Support
CM .... Configuration Management
CMMI® .... Capability Maturity Model Integration
CONOPS .... Concept of Operations
COTS .... Commercial Off-The-Shelf
CPI .... Continuous Process Improvement
CPU .... Central Processing Unit
CSCI .... Computer Software Configuration Item
CTE .... Critical Technology Element
CWBS .... Consolidated Work Breakdown Structure
D .... Draft (in reference to maturity of an artifact)
DoD .... Department of Defense
DoDD .... Department of Defense Directive
DoDI .... Department of Defense Instruction
EMD .... Engineering and Manufacturing Development
ESOH .... Environmental Safety and Occupational Health
EVMS .... Earned Value Management System
F .... Final (in reference to maturity of an artifact)
FMEA/FMECA .... Failure Mode and Effects Analysis / Failure Modes Effects and Criticality Analysis
FQT .... Formal Qualification Testing
GOTS .... Government Off-The-Shelf
HWCI .... Hardware Configuration Item
ICD .... Initial Capabilities Document
ICE .... Independent Cost Estimate
IDE .... Integrated Development Environment
IEEE/EIA .... Institute of Electrical & Electronics Engineers/Electronic Industries Alliance
IIV&V .... Internal Independent Verification and Validation

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IRR ....Integration Readiness Review
IRS ....Interface Requirements Specification
ITR...............................Initial Technical Review
KPP ....Key Performance Parameter
KSA ....Knowledge, Skill, and Abilities
LCSP ....Life Cycle Sustainment Plan
MARCORSYSCOM ....Marine Corps Systems Command
MDA.............................Milestone Decision Authority
MS ....Milestone
NAVAIR ....Naval Air Systems Command
NAVSEA.......................Naval Sea Systems Command
NDI ....Non Developmental Items
PCA ....Physical Configuration Audit
PEO ....Program Executive Office
PM................................Program Manager
PMO ....Program Management Office
PoPS ....Probability of Program Success
QA ....Quality Assurance
R&M.............................Reliability and Maintainability
RFA ....Request for Action
RFI...............................Request for Information
RFP ....Request for Proposal
RMP.............................Requirements Management Plan
RTM.............................Requirements Traceability Matrix
SAD ....Software Architecture Description
SAMP ....Software Acquisition Management Plan
SCDS............................Safety Critical Digital Systems
SDD..............................Software Design Description
SDP ....Software Development Plan
SDS ....Systems Design Specification
SECNAVINST................Secretary of the Navy Instruction
SEP ....System Engineering Plan
SETR............................Systems Engineering Technical Review
SFR ....System Functional Review
SIDD.............................Software Interface Design Description
SME.............................Subject Matter Expert
SPAWAR.......................Space and Naval Warfare Systems Command
SPII..............................Software Process Improvement Initiative

SQA .... Software Quality Assurance
SRD .... Software Requirements Description
SRR .... System Requirements Review
SRS .... Software Requirements Specification
SSA .... Source Selection Authority or Software Sustainment Activity/Organization
SSR .... Software Specification Review
STP .... Software Test Plan
SUM .... Software Users Manual
SVR .... System Verification Review
SW .... Software
SWWG .... Software Working Group
SYSCOM .... Systems Command
TDS .... Technology Development Strategy
TEMP .... Test and Evaluation Master Plan
TES .... Test and Evaluation Strategy
TIM .... Technical Interchange Meeting
TOC .... Total Ownership Cost
TRB .... Technical Review Board
TRR .... Test Readiness Review
U .... Update (in reference to maturity of an artifact)
VDD .... Version Description Document

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Enclosure (1). SETRs Applicable to Software Intensive Systems
(information from Table 5-1 of *Naval SETR Handbook*)

SETR	Purpose	Timing
Initial Technical Review	Supports technical basis for initial cost estimates and POM budget submissions.	Materiel Solution Analysis (pre-MDA MS A)
Alternative System Review	Reviews results of Materiel Solution Analysis phase and assesses technology development plan and preferred system concept.	Materiel Solution Analysis (pre-MDA MS A)
System Requirements Review (see Note 1)	Assesses technical readiness to enter Engineering & Manufacturing Development phase.	Technology Development (pre-MDA MS B)
System Functional Review	Assesses System Functional Baseline and readiness to begin functional allocation.	Technology Development (pre-MDA MS B)
Software Specification Review	Assesses completeness of software specification.	Technology Development (pre-MDA MS B)
Preliminary Design Review (see Note 2)	Assesses System Allocated Baseline and readiness to begin detailed design.	Pre/post-MDA MS B
Critical Design Review	Assesses System Product Baseline and supports Design Readiness Review.	Engineering & Manufacturing Development (pre-MDA MS C)
Integration Readiness Review	Assesses readiness of software systems.	Engineering & Manufacturing Development (pre-MDA MS C)
Test Readiness Review	Assesses system readiness to begin Developmental Test and Evaluation (DT&E).	Engineering & Manufacturing Development (pre-MDA MS C)
System Verification Review	Assesses system compliance with functional baseline.	Production and Deployment (pre-MDA MS C)
Production Readiness Review	Assesses system readiness to enter production.	Production and Deployment (post-MDA MS C)
Physical Configuration Audit	Assesses the as-delivered system for compliance with the product baseline and supports full-rate production decision.	Production and Deployment (post-MDA MS C during initial operational capability)

Notes:

1. A best practice is for SRR to be accomplished in two parts.

   SRR1 is to ensure the government has established performance requirements and non-tailorable design requirements that are directly traceable to the CDD.

SRR2 is a technical assessment of the developing system specification under review to ensure a reasonable expectation of the final system being judged operationally effective and suitable.

2. PDR – A best practice is for PDR to be accomplished in two parts, an initial PDR and a Closure PDR. The PM should plan for a PDR before Milestone B, consistent with associated prototyping requirements. If a PDR has not been conducted prior to Milestone B, the PMs shall plan to accomplish a minimum set of PDR requirements to support SDS development. A minimum MS B preparatory PDR represents a physically architected system based on full engagement of subsystem suppliers and knowledge gained through prototyping and identified in the technology development strategy. Following the Closure PDR, the PM shall send a PDR closure report to the MDA.

Enclosures (4) through (8) use a short-hand notation for the two PDR SETR events. PDR1 criteria were developed for use at a pre-Milestone B PDR, while PDR2 criteria were developed for use post-Milestone B.

Enclosure (2). Software Centric Artifacts and Core Metrics, with their governing policy, guidance, and standards

This table provides the list of software centric artifacts along with Department of the Navy (DoN) policy, guidance from both Navy and commercial sources, and applicable IEEE/EIA standards. DoN policy requires that offerors submit a Software Development Plan (SDP) with their proposals and after contract award (see Sections 7.4.1, 8.1.1, and Appendix E of the *Guidebook for Acquisition of Naval Software Intensive Systems* for additional information). DoN policy also requires the use of core metrics for all software intensive systems (see section 5 of this supplement). All other artifacts may be tailored by the program office to meet the needs of the specific program (see section 7 of this supplement). However, policy requires that the information content of IEEE/EIA Standard 12207.1 documents "must be provided in some format, as appropriate, for the proposed work effort."

Software Centric Artifacts	Policy	Guidance	Standards

Prime/Subs Software Development Plans (SDPs)
   Requirements Management Plan
   Configuration Management Plan
	ASN(RD&A) memo: Software Process Improvement Initiative (SPII) Contract Language, 17 November 2006
	
	ASN(RD&A) memo: SPII Guidance for use of SPI Contract Language, 13 July 2007
	
	ASN(RD&A) memo: DoN Policy for Acquisition of Naval Software Intensive Systems, 16 Sep 2008
	
	Public Law 107-314, Section 804 (FY-03 Defense Authorization Act, dated 2 Dec 2002)
		ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008, Appendix L.
		
		CMMI® for Development 2nd Edition, Ver 1.2, Addison Wesley SEI Series, 2007
			IEEE/EIA Std 12207.1-1997, Clauses 6.5, 6.8, 6.9, 6.11, and 6.14

Software Acquisition Management Plan (SAMP)	Public Law 107-314, Section 804 (FY-03 Defense Authorization Act, dated 2 Dec 2002) ASN(RD&A) memo: DoN Policy for Acquisition of Naval Software Intensive Systems, 16 Sep 2008	CMMI® for Acquisition, Ver 1.2, Addison Wesley SEI Series, 2009	
Software Requirements Traceability Matrix (RTM)	Naval SYSCOM Systems Engineering Policy, 7 Jul 2009 (NAVSEAINST 5000.9 NAVAIRINST 5000.24 SPAWARINST 5000.1 MARCORSYSCOM Order 5400.5)	CMMI® for Development 2nd Edition, Ver 1.2, Addison Wesley SEI Series, 2007	

Measurement Plan	ASN(RD&A) memo: DoN Software Measurement Policy for Software Intensive Systems, 22 July 2008 Public Law 107-314, Section 804 (FY-03 Defense Authorization Act, dated 2 Dec 2002) ASN(RD&A) memo: DoN Policy for Acquisition of Naval Software Intensive Systems, 16 Sep 2008	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008 CMMI® for Development 2nd Edition, Ver 1.2, Addison Wesley SEI Series, 2007 "Measurement for DoD Projects", DoD Implementation Guidance, Practical Software and Systems Measurement, 24 February 2003	IEEE 1058, section 4.5.3.6
Software Requirements Description (SRD) - Includes: SW Requirements Specification (SRS) Interface Requirements Spec (IRS)	ASN(RD&A) memo: Software Process Improvement Initiative Contract Language, 17 November 2006	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008 CMMI® for Development 2nd Edition, Ver 1.2, Addison Wesley SEI Series, 2007	IEEE/EIA Std 12207.1-1997, Clause 6.22
Software Architecture Description (SAD)	ASN(RD&A) memo: Software Process Improvement Initiative Contract Language, 17 November 2006	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008	IEEE/EIA Std 12207.1-1997, Clause 6.12
Software Interface Design Description (SIDD)	ASN(RD&A) memo: Software Process Improvement Initiative Contract Language, 17 November 2006	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008	IEEE/EIA Std 12207.1-1997, Clause 6.19
Software Design Description (SDD)	ASN(RD&A) memo: Software Process Improvement Initiative Contract Language, 17 November 2006	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008	IEEE/EIA Std 12207.1-1997, Clause 6.16
Computer Software Configuration Items (CSCIs)			IEEE/EIA Std 12207.1-1997, Clauses 6.7 and 6.13
System/Software Integration Plan	ASN(RD&A) memo: Software Process Improvement Initiative Contract Language, 17 November 2006	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008 CMMI® for Development 2nd Edition, Ver 1.2, Addison Wesley SEI Series, 2007	IEEE/EIA Std 12207.1-1997, Clause 6.18
Software Test Plan (STP)	ASN(RD&A) memo: Software Process Improvement Initiative Contract Language, 17 November 2006	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008 CMMI® for Development 2nd Edition, Ver 1.2, Addison Wesley SEI Series, 2007	IEEE/EIA Std 12207.1-1997, Clause 6.27

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Software Build Plan		SYSCOM best practice	
Operator Guide/Users Guide		SYSCOM best practice	
Software Product Baseline		SYSCOM best practice	
Test Problem/Trouble Report	ASN(RD&A) memo: Software Process Improvement Initiative Contract Language, 17 November 2006	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008	IEEE/EIA Std 12207.1-1997, Clause 6.10
Test Procedures/Scripts/Cases	ASN(RD&A) memo: Software Process Improvement Initiative Contract Language, 17 November 2006	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008	IEEE/EIA Std 12207.1-1997, Clause 6.28
Software Life Cycle Sustainment Plan (appendix to System LCSP)		CMMI® for Acquisition, Ver 1.2, Addison Wesley SEI Series, 2009	
Software Risks/Mitigation Plans	Naval SYSCOM Risk Management Policy, 21 Jul 2008 (NAVSEAINST 5000.8 NAVAIRINST 5000.21B SPAWARINST 3058.1 MARCORSYSCOM Order 5000.3) Public Law 107-314, Section 804 (FY-03 Defense Authorization Act, dated 2 Dec 2002)	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008 Risk Management Guide for DOD Acquisition, Sixth Edition, Version 1.0, Aug. 2006 CMMI® for Development 2nd Edition, Ver 1.2, Addison Wesley SEI Series, 2007 CMMI® for Acquisition, Ver 1.2, Addison Wesley SEI Series, 2009	IEEE 1058, section 4.5.4

Core Software Metrics	Policy	Guidance	Standards
Software Core Metric – Software Size/Stability	ASN(RD&A) memo: DoN Software Measurement Policy for Software Intensive Systems, 22 July 2008 Public Law 107-314, Section 804 (FY-03 Defense Authorization Act, dated 2 Dec 2002) ASN(RD&A) memo: DoN Policy for Acquisition of Naval Software Intensive Systems, 16 Sep 2008	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008 CMMI® for Development 2nd Edition, Ver 1.2, Addison Wesley SEI Series, 2007 "Measurement for DoD Projects", DoD Implementation Guidance, Practical Software and Systems Measurement, 24 February 2003	IEEE 1058, section 4.5.3.6
Software Core Metric – Software Cost/Schedule	ASN(RD&A) memo: DoN Software Measurement Policy for Software Intensive Systems, 22 July 2008 Public Law 107-314, Section 804 (FY-03 Defense Authorization Act, dated 2 Dec 2002) ASN(RD&A) memo: DoN Policy for Acquisition of Naval Software Intensive Systems, 16 Sep 2008	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008 CMMI® for Development 2nd Edition, Ver 1.2, Addison Wesley SEI Series, 2007 "Measurement for DoD Projects", DoD Implementation Guidance, Practical Software and Systems Measurement, 24 February 2003	IEEE 1058, section 4.5.3.6
Software Core Metric – Software Quality	ASN(RD&A) memo: DoN Software Measurement Policy for Software Intensive Systems, 22 July 2008 Public Law 107-314, Section 804 (FY-03 Defense Authorization Act, dated 2 Dec 2002) ASN(RD&A) memo: DoN Policy for Acquisition of Naval Software Intensive Systems, 16 Sep 2008	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008 CMMI® for Development 2nd Edition, Ver 1.2, Addison Wesley SEI Series, 2007 "Measurement for DoD Projects", DoD Implementation Guidance, Practical Software and Systems Measurement, 24 February 2003	IEEE 1058, section 4.5.3.6
Software Core Metric – Software Organization	ASN(RD&A) memo: DoN Software Measurement Policy for Software Intensive Systems, 22 July 2008 Public Law 107-314, Section 804 (FY-03 Defense Authorization Act, dated 2 Dec 2002) ASN(RD&A) memo: DoN Policy for Acquisition of Naval Software Intensive Systems, 16 Sep 2008	ASN(RD&A) Guidebook for Acquisition of Naval Software Intensive Systems, Sep. 2008 CMMI® for Development 2nd Edition, Ver 1.2, Addison Wesley SEI Series, 2007 "Measurement for DoD Projects", DoD Implementation Guidance, Practical Software and Systems Measurement, 24 February 2003	IEEE 1058, section 4.5.3.6

Enclosure (3): List of Elements

This enclosure provides a complete list of the elements for each artifact. Elements describe the content of each artifact, and are essentially a 'Table of Contents' list. Criteria Statements for use at SETR events are not provided for each element, but only for those elements that contribute to the evaluation of software health and software contributions to risk through specific points in the acquisition lifecycle. For further information, see Section 2 and Section 4.3 in this supplement.

The numbering system for all elements aligns with the element identifiers accompanying the artifact-based criteria statements provided in enclosures (4), (5) and (6) to this supplement. The numbering system for the Prime/Subs Software Development Plans (SDP) is taken from Appendix L to the *Guidebook for Acquisition of Naval Software Intensive Systems*, with an expanded content list for the Configuration Management Plan and Requirements Management Plan.

Computer Software Configuration Items (CSCIs)

A. Label: Name and traceable unique identifier
B. Purpose/Scope: Clear and concise capability-based description
C. Interfaces: Other CSCIs required and/or linked to
D. Input/Output: Include results transformed from source as specified in software configuration management index
E. Data Integrity: Data integrity check data

Measurement Plan

A. Project Overview
B. Document Overview
C. References
D. Related Documents
E. Measurement Objectives
F. Analysis Methods
G. Applicable Metrics
H. Software Items to be Measured
I. Measurement Process
  I.1. Data collection
  I.2. Schedule
J. Measurement Tools
K. Reports
L. Roles and Responsibilities

Operator Guide/Users Guide

A. System Description
B. Scope
C. Audience
D. Key Features
E. Access Control
F. First Time Users
G. Step-By-Step How To
H. Installation Instructions
I. Configuration Instructions

Prime/Subs Software Development Plans (SDPs)

Title Page
Signature Page
Change History
Preface
Table of Contents
List of Figures
List of Tables
1. Overview of Plan
  1.1 Purpose, Scope, and Objectives
  1.2 Plan Assumptions and Constraints
2 Product Overview
  2.1 Product Role and Mission
  2.2 Product Modes of Operation
  2.3 Special Considerations

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Software Acquisition Management Plan (SAMP)

A. Project Overview

B. Document Overview

C. References

D. Related Documents

E. Software Acquisition Strategy

F. Software Acquisition Management Tasks

G. Roles and Responsibilities

Software Architecture Description (SAD)

A. Generic description information (Purpose, Scope, References, Context)

B. System overview and identification

C. Software item architectural design

    C.1. Software architecture general description

    C.2. Software component definition

    C.3. Identification of software requirements allocated to each software component

    C.4. Software component concept of execution

    C.5. Resource limitations and the strategy for managing each resource and its limitation

D. Rationale for software architecture and component definition decisions, including database and user interface design

Software Build Plan

A. Project Overview

B. Document Overview

C. References

D. Related Documents

E. Scope of Build

F. Build Development Instructions

G. Build Tracking

H. Tools

I. Build Acceptance Criteria

J. Traceability

Software Design Description (SDD)

A. Generic description information (Purpose, Scope, References, Context)

B. Description of how the software item satisfies the software requirements, including algorithms and data structures

C. Software item input/output description

D. Static relationships of software units

E. Concept of execution, including data flow and control flow

F. Requirements traceability

    F.1. Software component-level requirements traceability

    F.2. Software unit-level requirements traceability

G. Rationale for software item design

H. Error type definitions and error handling design

I. Reuse element identification

Software Interface Design Description (SIDD)

A. Generic description information (Purpose, Scope, References, Context)

B. External interface identification

C. Software component identification

D. Software unit identification

E. External-software item interface definition (e.g., source language, diagrams)

F. Software item-software item interface definition (e.g., source language, diagrams)

G. Software component-software component interface definition (e.g., source language, diagrams)

H. Design Methodology

I. Data Element Description

    I.1. Source

    I.2. Recipient

J. Communication methods

K. Interface error types and error handling requirements

Software Life Cycle Sustainment Plan

A. The overall software support concept and performance-based sustainment strategy

B. How the software sustainment considerations are being addressed as an integral part of the program's overall acquisition strategy and system design process

C. How the software sustainment metrics will be achieved and sustained throughout the life cycle

D. The funding required and budgeted by year and appropriation for the software sustainment cost category consistent with the Acquisition Program Baseline

Software Product Baseline

A. Source Code

    A.1. Delivered in the native electronic format

    A.2. Validated to ensure that Builds provide the same executable code as that delivered

    A.3. Safety critical source code shall be clearly identified for traceability

    A.4. COTS/NDI shall be delivered on original Licensed Media

B. Executable Software

    B.1. Delivered in the native electronic format

    B.2. Includes all files for each final Build, including any batch files, command files, data files, or other software files needed to install and operate the software on target computer(s)

    B.3. COTS/NDI shall be delivered on original Licensed Media

C. Software support information

    C.1. "As built" design information

    C.2. Compilation, build, and modification procedures

    C.3. Information for ordering executable code and/or source files

Supplement to Guidebook for Acquisition of Naval Software Intensive Systems

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D. Firmware Support Manual (as an Appendix) – if firmware is part of the delivered product

Software Requirements Description (SRD)

A. Generic description information (Purpose, Scope, References, Context)

B. System identification and overview

C. Required states and modes

D. Functionality of the software item

    D.1. Performance requirements

    D.2. Physical characteristics

    D.3. Environmental conditions

E. Requirements analysis approach/methodology

F. Requirements for interfaces external to software item

G. Qualification requirements

H. Safety specifications, including those related to methods of operation and maintenance, environmental influences, and personnel injury

I. Security and privacy specifications, including those related to compromise of sensitive information

J. Human-factors engineering (ergonomics) requirements

    J.1. Manual operations

    J.2. Human-equipment interactions

    J.3. Constraints on personnel

    J.4. Areas that need concentrated human attention and are sensitive to human errors and training

K. Data definition and database requirements, including installation-dependent data for adaptation needs

L. Installation and acceptance requirements of the delivered software product at the operation site(s)

M. Installation and acceptance requirements of the delivered software product at the maintenance site(s)

N. User documentation requirements

O. User operation and execution requirements

P. User maintenance requirements

Q. Software quality characteristics

R. Design and implementation constraints

S. Computer resource requirements

T. Packaging requirements

U. Precedence and criticality of requirements

V. Requirements traceability

W. Rationale

Software Requirements Traceability Matrix (RTM)

A. Requirement ID

B. Requirement Text

C. Traces From

D. Traces To

E. Verification Method

F. Verification Results

Software Risks/Mitigation Plans

A. Project Overview

B. Document Overview

C. References

D. Related Documents

E. Risk Management Plan

    E.1 Roles and Responsibilities

    E.2 Tools

    E.3 Strategy

F. Risk Handling

    F.1 Risk Identification

    F.2 Risk Assessment

    F.3. Identified Risks

    F.4 Mitigation Strategy

        F.4.a Transfer

        F.4.b Accept

        F.4.b Avoid

        F.4.c Monitor

        F.4.e Control

    F.5 Reports

Software Test Plan (STP)

A. Generic Plan Information (Overview, Purpose, Scope, References, Approval Authority, Risks)

B. Test Resources

  B.1. Personnel

  B.2. Participating Organizations

  B.3. Training

  B.4. Equipment

  B.5. Tools

  B.6. Environment

C. Roles and Responsibilities

D. Test Scope

  D.1. What Will Be Tested and What Won't Be

  D.2. Breadth and Depth of Coverage / How Sufficiency of Testing Will Be Assured

  D.3. Planned Tests (an overview of each test case, including its unique identifier)

E. Test Approach

  E.1. Test Levels and Classes of Software Tests

  E.2. General Test Conditions

  E.3. Test Progression

  E.4. Data Recording, Reduction, and Analysis

  E.5. Pass/Fail Criteria

  E.6. Suspension/Resumption Criteria

F. Reports

  F.1. Test Reports

  F.2. Problem Reporting

G. Test Schedule

System/Software Integration Plan

A. Project Overview

B. Document Overview

C. References

D. Related Documents

E. Roles and Responsibilities

F. Integration Risks and Issues

G. Integration Strategy

H. Integration Testing:

  H.1. Test requirements

  H.2. Test procedures

  H.3. Test data

  H.4. Test responsibilities

  H.5. Test schedule

I. Tools

J. Acceptance Criteria

K. Traceability

Test Problem/Trouble Report

A. Generic report information (Date, Summary, Contributors)

B. Identification of the software item or software configuration item and/or the software life cycle process in which the problem was observed

  B.1. Requirement Tested

  B.2. Severity

C. Description of the problem to enable problem resolution

  C.1. Expected Result

  C.2. Actual Result

  C.3. Context

  C.4. Steps to Recreate Problem

D. Description of the corrective action taken to resolve the reported problem

E. Originator of report, and originator's assessment or urgency

F. Date problem discovered

G. Status of problem

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Test Procedures/Scripts/Cases

A. Generic procedure information (Purpose, Scope, Summary)

B. Identification of test author

C. Identification of test configuration

D. Relationship/Traceability to Software Test Plan

E. Test objectives, requirements, and rationale

F. Test preparations (hardware, software, other) for each test

G. Test descriptions

   G.1. Test identifier

   G.2. Requirements addressed

   G.3. Prerequisite conditions

   G.4. Context

   G.5. Test input

   G.6. Expected test results

   G.7. Criteria for evaluating results (e.g., upper/lower bounds, etc.)

   G.8. Instructions for conducting procedure

H. Requirements traceability

I. Rationale for decisions

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Enclosure (4). SETR criteria for artifacts created by the Government

This enclosure provides SETR criteria statements for artifacts created by the Government, and whose control remains with the Government throughout their maturity. The artifacts in this category are the following:

Measurement Plan

Software Acquisition Management Plan (SAMP)

SETR Criteria - Artifacts created by the Government
Enclosure (4) of Supplement to the Guidebook for Acquisition of Naval Software Intensive Systems

(v 1.0 September 2010)

Measurement Plan

Maturity Element Name	Score	ID	Criteria Statements

Artifact Description Defines the requirements for the reporting of software measures across the entire Program (including subcontractors and suppliers), defines and describes the required software measures, defines and describes the uses of the software measures for reporting and analysis, and defines the roles and responsibilities associated with execution of the Plan. These responsibilities include tracking and oversight activities. The Plan elaborates the details of the software metrics requirements as called out by the Software Development Plan. This Artifact includes coverage, as a minimum, of the four core SW metrics mandated by ASN RDA policy.

Artifact Creator: Government

Draft *at ASR*

Maturity Element Name	Score	ID	Criteria Statements
A. Project Overview	3	1054	Does the Measurement Plan provide an adequate overview of the program and is the format in accordance with Navy standards?
E. Measurement Objectives	2	4	Does the Measurement Plan clearly articulate the measurement objectives and desired outcomes for the program based on the preferred alternative solution(s) ?
G. Applicable Metrics	3	6	Does the Measurement Plan clearly state the applicable metrics that are collected by the project for the alternative being proposed (including the four core software metrics as stated in DoN Software Measurement Policy for Software Intensive Systems)?

Final *at SRR1*

Maturity Element Name	Score	ID	Criteria Statements
E. Measurement Objectives	1	11	Do the measures include detailed measures that reflect the current life cycle phase, including requirements measures?
F. Analysis Methods	2	12	Does the Measurement Plan clearly describe the methods used to analyze the measurement data collected by the program?
G. Applicable Metrics	1	13	Does the Measurement Plan clearly define the applicable metrics that are collected by the program, including software requirements measures (and the four core software metrics as stated in DoN Software Measurement Policy for Software Intensive Systems)?
I.1. Measurement Process - Data collection	2	14	Does the Measurement Plan clearly describe the methods that are to be used to collect the data for the program?

Update *at SRR2*

Maturity Element Name	Score	ID	Criteria Statements
H. Software Items to be Measured	1	15	Does the Measurement Plan clearly describe the software items that are to be measured by the program?
I.1. Measurement Process - Data collection	2	16	Have the Measurement Plan data collection methods been validated?
J. Measurement Tools	2	17	Does the Measurement Plan contain a description of the measurement tools that are to be used to collect, analyze, and report the data for the program?

Update   *at SFR*

H. Software Items to be Measured	**2**	*18*	Has the Measurement Plan been updated to reflect any changes to the software items that are to be measured by the program?
K. Reports	**2**	*19*	Does the Measurement Plan contain a description of the reports that are generated to report the data for the program?

Update   *at SSR*

H. Software Items to be Measured	**2**	*1412*	Has the Measurement Plan been updated to reflect any changes to the software items that are to be measured by the program?
I.2. Measurement Process - Schedule	**2**	*50*	Does the Measurement Plan contain a schedule for the collection and reporting of the measurement data for the program?
L. Roles and Responsibilities	**2**	*20*	Does the Measurement Plan contain a description of the measurement roles and responsibilities for the program?

Update   *at PDR2*

A. Project Overview	**1**	*1453*	Has the Measurement Plan been updated to reflect any changes resulting from the contractor's software metrics collection and analysis approach/process/tools, as described in their SDP and agreed to by the program office?

SETR Criteria - Artifacts created by the Government
Enclosure (4) of Supplement to the Guidebook for Acquisition of Naval Software Intensive Systems
(v 1.0 September 2010)

Maturity		*Software Acquisition Management Plan (SAMP)*	
Element Name	*Score*	*ID*	*Criteria Statements*

Artifact Description A living government document reflecting the processes in use for software acquisition management throughout development. This document is organized into sections that address different areas of software acquisition management. Sections include: scope of the document; documents that are referenced in this SAMP; general software acquisition planning guidelines; description of software supplier selection; software acquisition management tasks; software product acceptance, qualification, and associated issues; software release; software use; software transition and maintenance; software quality assurance (SQA); software configuration management (CM) ; and acronyms, definitions, along with other useful information, as needed.

Artifact Creator: Government

Draft *at SRR2*

E. Software Acquisition Strategy	**2**	*175*	Does the SAMP clearly document the software acquisition strategy to be used in this procurement?

Final *at SFR*

E. Software Acquisition Strategy	**1**	*176*	Has the software acquisition strategy in the SAMP been updated to reflect any changes in the strategy?

Update *at SSR*

F. Software Acquisition Management Tasks	**1**	*179*	Have the software acquisition management tasks been delineated in sufficient detail in the SAMP?

Update *at PDR1*

G. Roles and Responsibilities	**2**	*183*	Have the software acquisition roles and responsibilities been clearly defined in the SAMP?

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Enclosure (5). SETR criteria for artifacts created by the Developer

This enclosure provides SETR criteria statements for artifacts created by the Developer, and whose control remains with the Developer throughout their maturity. The artifacts in this category are the following:

Operator Guide/Users Guide

Software Architecture Description (SAD)

Software Build Plan

Software Design Description (SDD)

Prime/Subs Software Development Plan (SDP)

Software Interface Design Description (SIDD)

Software Product Baseline

Software Test Plan (STP)

System/Software Integration Plan

Test Procedures / Scripts / Cases

SETR Criteria - Artifacts created by the Developer
Enclosure (5) of Supplement to the Guidebook for Acquisition of Naval Software Intensive Systems
(v 1.0 September 2010)

Maturity Element Name	Score	ID	Criteria Statements
			Operator Guide/Users Guide
Artifact Description			Tells a hands-on software user how to install and use a Computer Software Configuration Item (CSCI), a group of related CSCIs, or a software system or subsystem. It may also cover a particular aspect of software operation, such as instructions for a particular position or task. It 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 guides unnecessary.
Artifact Creator:			Developer

Draft _at_ **IRR**

D. Key Features	2	1441	Does system user/operator documentation cover step-by-step "how to" daily operational use of the system, and has it been concurred with by the user community? Are detailed installation and configuration instructions included?

Update _at_ **TRR**

C. Audience	3	60	Is documented guidance adequate for all operators and maintainers of the system once it is fielded?
D. Key Features	2	1384	Does system user/operator documentation cover step-by-step "how to" daily operational use of the system, and has it been concurred with by the user community? Are detailed installation and configuration instructions included?

Final _at_ **PRR**

G. Step-By-Step How To	2	1400	Have step-by-step "how to" instructions been documented for all system users and operators? Has user/operator access control been fully and clearly documented?
I. Configuration Instructions	2	73	Have all site-specific configuration instructions been clearly and fully documented and verified?

SETR Criteria - Artifacts created by the Developer
Enclosure (5) of Supplement to the Guidebook for Acquisition of Naval Software Intensive Systems
(v 1.0 September 2010)

Maturity Element Name	Score	ID	Software Architecture Description (SAD) Criteria Statements

Artifact Description Provides architectural views to show the software architecture achieves all of the specified quality attribute requirements. Provides a complete packet of information for each view, which includes: a primary graphical presentation; an element catalog that explains the elements and relations in the primary presentation; a variability/options guide that describes points in the architecture that can change across versions, can be reconfigured or simply are not defined yet; rationale for non-obvious design decisions or decisions that are the source of questions, are critical, or have a widespread effect; relevant constraints, rejected alternatives, ramifications of the decision, and evidence that the decision was the correct one; and analyses results of the architecture. The SAD also captures cross-view information, which includes a system overview (with a context diagram) and a mapping between views (e.g. using a table to show how the elements of one view correspond to elements of another view). Open architecture standard requirements conflicts are documented, including proposed resolutions. If approved, include when, where, and how Government approval of the resolution was achieved.

Artifact Creator: Developer

Draft   *at PDR2*

Element Name	Score	ID	Criteria Statements
C.1. Software item architectural design, including: Software architecture general description	2	442	Does the software architecture general description provide a clear overview of the software architecture, including all software items and interfaces?
C.2. Software item architectural design, including: Software component definition	1	1363	Is the software component concept of execution adequately articulated, and software components of each software item sufficiently defined, so that detailed design can proceed?
D. Rationale for software architecture and component definition decisions, including database and user interface design	3	462	Is the rationale for architecture decisions clearly articulated?

Final   *at CDR*

Element Name	Score	ID	Criteria Statements
C.3. Software item architectural design, including: Identification of software requirements allocated to each software component	3	451	Does the allocation of software requirements to software components cover all software requirements so that component implementation can be completed?
C.4. Software item architectural design, including: Software component concept of execution	3	455	Is the software component concept of execution adequately articulated so that software implementation can proceed?
C.5. Software item architectural design, including: Resource limitations and the strategy for managing each resource and its limitation	4	459	Has the strategy for managing each resource and its limitations been adequately addressed?
D. Rationale for software architecture and component definition decisions, including database and user interface design	1	463	Has the rationale for all changes in the software architecture since PDR been clearly articulated?

Update   at IRR

C.3. Software item architectural design, including: Identification of software requirements allocated to each software component	4	1443	Have all changes to the allocation of software requirements to software components since PDR been approved by a Navy Configuration Control Board?
C.5. Software item architectural design, including: Resource limitations and the strategy for managing each resource and its limitation	1	1442	Have any changes to the strategy for managing computer resources and their limitations (e.g., CPU memory and bandwidth) been clearly documented for deployment to system test sites?

Update   at TRR

C.3. Software item architectural design, including: Identification of software requirements allocated to each software component	4	452	Have all changes to the allocation of software requirements to software components since PDR been approved by a Navy Configuration Control Board?
C.5. Software item architectural design, including: Resource limitations and the strategy for managing each resource and its limitation	1	460	Have any changes to the strategy for managing computer resources and their limitations (e.g., CPU memory and bandwidth) been clearly documented for deployment to system test sites?

Update   at SVR

C.5. Software item architectural design, including: Resource limitations and the strategy for managing each resource and its limitation	1	461	Have any changes to the strategy for managing computer resources and their limitations (e.g., CPU memory and bandwidth) been clearly documented for initial deployment to operational sites?
D. Rationale for software architecture and component definition decisions, including database and user interface design	3	465	Has the rationale for all changes in the software architecture since CDR been clearly articulated and documented to support maintenance of the software during life cycle sustainment?

SETR Criteria - Artifacts created by the Developer
Enclosure (5) of Supplement to the Guidebook for Acquisition of Naval Software Intensive Systems
(v 1.0 September 2010)

Software Build Plan

Maturity Element Name	Score	ID	Criteria Statements

Artifact Description Contractor format. Program specific; software developed and made available via build (term used for the purpose of this description), block, or release approach. Plan may include: introduction stating the purpose and scope; applicable documents for compliance and guidance; approach that covers the development process and identifies each software build with its associated content (e.g. list of capabilities and partial capabilities) along with the build assignments (where they will be used); and resources that includes the responsible organization(s) and the schedule, which maps out the planned need dates with respect to the various program-specific development activities (e.g. software integration and test (I&T), systems I&T, and platform I&T).

Artifact Creator: Developer

Draft *at PDR2*

Element Name	Score	ID	Criteria Statements
E. Scope of Build	1	369	Have all of the requirements allocated to each specific build been clearly identified per build, including a list of the CSCIs (and/or incremental portions of CSCIs) to be included in each build and the functionality to be provided by each build?
F. Build Development Instructions	2	372	Are all software build instructions clear and complete? Do the instructions include verification processes?
H. Tools	2	378	Have all software build tools been defined and verified? Has a process been established to accredit the tools? Has the team been trained on how to use the tools and what to expect from them?

Final *at CDR*

Element Name	Score	ID	Criteria Statements
G. Build Tracking	1	376	Does the plan include a method for tracking builds that is consistent with the configuration management plan?
I. Build Acceptance Criteria	1	382	Does each build clearly identify requirements being met? Is the set of minimum requirements for acceptance indicated?

Update *at IRR*

Element Name	Score	ID	Criteria Statements
I. Build Acceptance Criteria	3	1444	Have previously defined build acceptance criteria been updated if necessary?

Update *at TRR*

Element Name	Score	ID	Criteria Statements
I. Build Acceptance Criteria	3	383	Have previously defined build acceptance criteria been updated if necessary?

SETR Criteria - Artifacts created by the Developer
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Software Design Description (SDD)

Maturity Element Name	Score	ID	Criteria Statements

Artifact Description Describes the design of a software item. Safety-critical items shall be clearly identified for traceability. Describes software design decisions, the architectural design, and detailed design (e.g. lowest level Computer Software Units and Packages). Includes a matrix that shows where requirements from the corresponding SRS are designed into the software code. Content Includes: a) Generic description information; b) Description of how the software item satisfies the software requirements, including algorithms and data structures; c) Software item input/output description; d) Static relationships of software units; e) Concept of execution, including data flow and control flow; f) Requirements traceability: 1) Software component-level requirements traceability, 2) Software unit-level requirements traceability; g) Rationale for software item design; h) Reuse element identification.

Artifact Creator: Developer

Draft   *at PDR2*

Element	Score	ID	Criteria Statement
B. Description of how the software item satisfies the software requirements, including algorithms and data structures	1	1362	Has the top-level design been clearly developed, and does it describe how each software item satisfies the allocated requirements? Is the input/output description for each software item clearly articulated and will it enable detailed design to proceed?
F.1. Requirements traceability:Software component-level requirements traceability	3	557	Is the component-level traceability clearly established?
G. Rationale for software item design	3	565	Is the rationale for the design of each software item clearly articulated?
I. Reuse element identification	3	573	Is an appropriate reuse methodology clearly defined for the software design?

Final   *at CDR*

Element	Score	ID	Criteria Statement
B. Description of how the software item satisfies the software requirements, including algorithms and data structures	2	538	Is the description of how the software units satisfy the requirements clearly articulated in the final detailed design?
C. Software item input/output description	2	542	Is the input/output description for each software unit clearly articulated in the detailed design?
E. Concept of execution, including data flow and control flow	3	550	Is concept of execution adequately addressed for each software item in the detailed design?
F.2. Requirements traceability: Software unit-level requirements traceability	3	562	Is traceability at the software unit level clearly established?
G. Rationale for software item design	2	566	Is the rationale for design changes to any software items made since PDR clearly articulated?

Update   *at IRR*

Element	Score	ID	Criteria Statement
H. Error type definitions and error handling design	1	571	Have any changes in error types or error handling occurred since CDR? Are they articulated clearly enough to enable implementation and validation?

Update   *at   SVR*

Maturity Element Name	Score	ID	Criteria Statements
I. Reuse element identification	**3**	*576*	Have any changes to the reuse methodology been documented for use during life cycle sustainment of the software?

SETR Criteria - Artifacts created by the Developer
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Maturity Element Name	Score	ID	Prime/Subs Software Development Plans (SDPs) Criteria Statements

Artifact Description Describes plans for conducting a software development effort. The term "software development" is meant to include new development, modification, reuse, reengineering, maintenance, and all other activities resulting in software products. Provides the Government insight into, and a tool for monitoring, the processes to be followed for software development, the methods to be used, the approach to be followed for each activity, and project schedules, organization, and resources. Defines the Contractor's life cycle model and the processes used; includes primary, supporting and organizational processes. The SDP shall reference appropriate Plans or Procedures. The level of detail shall be sufficient to define all software development processes, activities and tasks to be conducted. Includes specific standards, methods, tools, actions, strategies, and responsibilities associated with development and qualification of all requirements, including safety and security. The SDP shall include a detailed software development schedule. Should include the coding programming standards, the user interface guide, safety programming guides as appendixes. See Appendix L to the 'Guidebook for Acquisition of Naval Software Intensive Systems' for a full Data Item Description (DID). SDPs are assumed to include the Software Requirements Management Plan and Software Configuration Management Plan (See elements 11.1 and 10.2, respectively, of the SDP artifact).

Artifact Creator: Developer

Final *at PDR2*

Element	Score	ID	Criteria
Signature Page	4	729	Has the SDP been signed by individuals who have the authority to allocate resources?
2.1 Product Role and Mission	4	749	Is the use of the software compatible with the intended system operation and support concept, and have restrictions been identified?
2.2 Product Modes of Operation	4	751	Does a "States and Modes" description exist at a system level?
3.4 Assumptions and Constraints	2	1364	Does the SDP list all software assumptions and constraints that may adversely impact overall system and software development?
6 Project Management		769	Section Title
6.1.3 External Interfaces and Dependencies	2	775	Have the responsibilities, missions, and interfaces of: software quality assurance, systems engineering, configuration management, and software/system test functions been defined?
6.1.4 Roles and Responsibilities	3	777	Have all project management roles been identified, documented, described and allocated to specific named resources?
6.3 Work Breakdown Structure	1	781	Does the proposed CWBS identify software components and work packages of manageable size and development effort that are linked with and trace to work definitions at the systems level?
6.4 Reporting Plan	3	791	Are the defined software cost status and reporting systems for all team members compatible with the program cost status and reporting requirements?
6.6 Metrics Plan	1	795	Have the metrics selected (to include but not limited to (1) software size, (2) software cost / schedule, (3) software quality, (4) software organization), the strategy for data collection, and the analyses to be performed been determined based on the program's defined software process?

Final   *at   PDR2*

Element Name	Score	ID	Criteria Statements
6.8 Risk Management Plan	1	1365	Does the SDP establish a strategy and repository for an active risk management program which classifies, categorizes, and tracks all risk items according to probability, exposure, and impact? Have short-falls and risks associated with the proposed development activities been identified, and have critical paths and tasks in the software development and associated schedules been identified?
7 Development Process	2	803	Has a process been defined to conduct design trade-offs (computer hardware, software) including sizing, cost, schedule, memory, throughput, reuse, maintainability, extensibility and other architectural considerations?
7.1.3 Open Systems	1	811	Does the software development approach ensure an open system will be developed in accordance with DoD net centric and information assurance policies?
7.1.4 Critical Requirements	2	813	Are the certification and accreditation processes defined or referenced for software activities involving: FMEA/FMECA, SCDS (Safety Critical Digital Systems), Secure or Trusted Systems, Supply Chain Management, Munitions, Cryptology, or any other effort domains with critical requirements that have high impact and long lead times?
7.3 Life Cycle Model	2	817	Has an engineering development life-cycle model consistent with the program requirements and needs been selected, and has the software development process been integrated into the selected systems engineering development process?
7.5 Verification Plan	3	1366	Does the SDP include a verification plan consistent with the system Test and Evaluation Strategy (TES)?
7.6 Validation Plan	3	1404	Does the SDP include a validation plan consistent with the system Test and Evaluation Strategy (TES)?
7.7 System Requirements Analysis	4	825	Has a system requirements analysis process been documented that addresses all changes to requirements, including those generated by the customer, to be maintained under configuration control?
7.8 System Architectural Design	4	827	Has the design selection process documented the rationale of all major systems engineering decisions and is the system architecture documented in a manner consistent with DoD mandates?
7.9 Software Requirements Analysis	1	829	Has the SDP established a clear & comprehensive approach to verify the Software Requirements Specifications (SRS) and Interface Requirements Specifications (IRS) at each level prior to further allocation & decomposition as to: validity, correctness, completeness, clarity, feasibility, consistency with top-level design concept, testability, and lack of inappropriate design detail?
7.10 Software Architectural Design	2	831	Does the SDP describe how software items will be decomposed into components?
7.12 Software Coding And Testing	1	835	Do plans for implementing test tools and building the test database allow Government access?
7.13 Software Integration	3	837	Does the SDP show evidence of a review of the development schedule based on a critical path analysis? Does it describe a well-developed plan for test tools and software integration?

Final   *at PDR2*

Element Name	Score	ID	Criteria Statements
7.13.1 Software Integration and Testing	2	1367	Does the SDP cover the breadth of software testing to include software unit testing, component integration testing, software qualification testing, and support for system integration and system qualifications testing?
10 Supporting Processes		873	Section Title
10.2 Configuration Management Plan	2	877	Is the Software Configuration Management Plan consistent with the System Configuration Management plan?
10.2.7 Configuration Management Plan - Roles and Responsibilities	3	891	Are software configuration management roles and responsibilities defined?
10.2.8 Configuration Management Plan - Tools	2	893	Are all Software Configuration Management Tools defined and aligned in the Software Configuration Management plan and available to all appropriate team members?
10.2.10 Configuration Management Plan - Configuration Control	1	897	Does the Software Configuration Management Plan require creation and management of a software baseline library which contains the functional, allocated, developmental, and product baselines?
10.2.11 Configuration Management Plan - Configuration Status Accounting	3	899	Have all subcontractors' software configuration management systems been reviewed and verified by the prime contractor to be totally compliant with program requirements and needs?
10.2.12 Configuration Management Plan - Configuration Audits	3	901	Have procedures and criteria been provided for a complete set of configuration audits including assigned responsibility and software baseline audits?
10.3 Quality Assurance Plan	4	903	Have points been defined in the SQA process where software quality is measured?
10.4.2 Management Reviews	3	909	Does the SDP include a series of management reviews with associated completion criteria that are used to control the software development progress?
10.4.3 Technical Reviews	2	911	Does the SDP describe or reference a documented process which requires reviewing and assessing the technical content of team member generated software work products and documentation?
10.6.1 Process Assessment	2	917	Do all software development processes align with industry best practices (e.g. CMMI)? Is there a documented plan to periodically assess software processes to identify opportunities for improvement?
10.6.2 Process Improvement	2	919	Is there a continuous process improvement (CPI) methodology in place for the program that is coordinated with software development and with the periodic process assessment results?
10.7 Test/Validation Plans	4	921	Do standards exist for documenting test requirements for the software across the program?
11.1 Requirements Management Plan	3	925	Does the contractor's Software Requirements Management Plan (RMP) include the necessary reviews, accountability, status assessment, schedule control, & reporting manage software related system development activities & is it consistent w/ the contractor's System RMP?
11.1.5 Requirements Management Plan - Requirements Process	1	1368	Are the software requirements revised and adjudicated under a formally controlled process as new requirements, changes, and reallocations are incorporated?

Final   *at PDR2*

11.1.8 Requirements Management Plan - Roles and Responsibilities	**3**	*941*	Have roles & responsibilities for SW requirements development & maintenance been defined & documented and have all project managers & other decision makers been identified and notified?
11.1.10 Requirements Management Plan - Measures	**3**	*945*	Have measures for software requirements management been defined and documented across the software development lifecycle?
11.1.11 Requirements Management Plan - Reports	**3**	*947*	Have all reports that will be used for software requirements management been described and their purposes stated?
11.1.12 Requirements Management Plan - Traceability Strategy	**1**	*949*	Has the requirements traceability strategy for software been defined in the SDP and the Requirements Traceability Matrix and Software Test Plan?
11.1.9 and 11.1.13 Requirements Management Plan - Repository Structure + Tools	**1**	*1369*	Has a repository structure been defined, and tools planned to be used for requirements work on the program listed? Have they been promulgated to each member of the software development team?

Maturity Element Name	Score	ID	Criteria Statements
Update *at CDR*			
1.2 Plan Assumptions and Constraint	2	1377	Has the SDP been updated since PDR, including any new processes or tools, constraints and assumptions, restrictions, and "States and Modes" description with additional detail?
6 Project Management		770	Section Title
6.1.3 External Interfaces and Dependencies	4	776	Does the SDP describe all organizations outside of those directly involved with software production on the program but who receive regular reporting on the status of software on the program, and are key positions listed with the names of the individuals assigned to those positions?
6.1.4 Roles and Responsibilities	3	778	Have special technology driven resources (e.g., specialists in languages, architectures, methods, tools, HSI) not assigned full time to the program been added since PDR?
6.3 Work Breakdown Structure	1	782	Does the CWBS identify software elements to levels that support management visibility, and are they compatible with program cost reporting requirements?
6.4 Reporting Plan	1	792	Have specific management processes been defined to account for the chosen software development methodologies and implementation languages selected?
6.6 Metrics Plan	2	796	Has the intended use of each software development metric been defined, including process control points (for collection, reporting, feedback) and variance thresholds?
7 Development Process	3	804	Does the software design and software work products reflect the software development process as defined at PDR?
7.1.3 Open Systems	1	812	Are documented artifacts (e.g. software APIs, web services) available to provide evidence of an open system?
7.1.4 Critical Requirements	2	814	Have the certification and accreditation processes defined at PDR been applied and/or updated as required, and have all software developers obtained secure coding certificates from either the SANS Institute or the Software Engineering Institute at Carnegie Mellon?
7.3 Life Cycle Model	2	818	Have software engineering development methodologies been selected and integrated in a manner this is supported across the entire life cycle, and has the rationale for selecting the models and methods been recorded?
7.5 Verification Plan	2	822	Does the SDP include a verification plan consistent with the Test and Evaluation Master Plan (TEMP)?
7.6 Validation Plan	2	824	Does the SDP include a validation plan consistent with the Test and Evaluation Master Plan (TEMP)?
7.7 System Requirements Analysis	1	826	Have all system requirements (including test and verification requirements) been analyzed, refined, and decomposed to assure complete functional allocation to hardware and software?
7.8 System Architectural Design	1	828	Has the architecture been sufficiently developed and reviewed for enabling design of each performance requirement?
7.9 Software Requirements Analysis	1	830	Have all functional, performance, and verification requirements for each incremental system or software block/build been allocated to planned increments prior to the design and development of the increment?

Update *at CDR*

Maturity Element Name	Score	ID	Criteria Statements
7.10 Software Architectural Design	2	832	Are changes in the architectural design managed by means of a defined change process, and is there a process for reevaluation of the architecture and the impact on design margins?
7.12 Software Coding And Testing	3	836	Do appropriate Government personnel have access to the test data?
7.13 Software Integration	2	838	Does the software integration plan start with the lowest level elements and build up (i.e. from build units up through all levels, including CSCI, HWCI, subsystem, and system)?
7.14 Software Qualification Testing	2	840	Is there a plan to review all code changes for correctness, and will regression testing be employed to avoid undesired impact on other software and system variables and components?
7.15 System Integration	3	842	Has the defect prevention plan been defined and maintained and does the software development process include dealing with defects when they arrive?
7.16 System Qualification Testing	2	844	Are independent product evaluations performed on all software work products before they are baselined?
7.17 Software Installation	3	846	Does the planned documentation for each build/release include sufficient installation and operations documents such as: Version Description Document (VDD), Software User's Manuals (SUM), etc.?
9 Maintenance Process	1	860	Have Reliability and Maintainability (R&M) processes been defined in a way that can be measured, controlled and reported (in all life-cycle phases)?
9.1 Process Implementation	2	862	Is software maintenance planned with adequate schedules and resources (people, funding) for all software increments (blocks, builds)?
9.2 Problem and Modification analysis	2	864	Are the Contractor Logistics Support (CLS) vs. government requirements documented including the effort, cost, and equipment required to support the system?
9.3 Modification Implementation	3	866	Are causal analysis meetings planned with common causes of defects identified, prioritized and systematically eliminated?
9.4 Maintenance Review/Acceptance	3	868	Have specific procedures been developed to resolve software vs. hardware discrepancies and to identify, document, track, and resolve software discrepancies?
9.5 Migration	2	870	Are all software rights (including: reused, team member, subcontracted, and vendor software) consistent with the program's life cycle support and maintenance needs?
10 Supporting Processes		874	Section Title
10.2 Configuration Management Plan	2	1378	Does the Configuration Management Plan include CM roles and responsibilities, a configuration control process, CM tools; CM Status Accounting, CM Audits, and identification of items under CM control?
10.3 Quality Assurance Plan	2	904	Has an independent organization been assigned the responsibility to monitor the software development process & the software products with sufficient qualified QA personnel staffed to accomplish their assigned responsibilities & functions as proposed for this program?

Update   *at CDR*

Maturity Element Name	Score	ID	Criteria Statements
10.4.2 Management Reviews	3	910	(1) Are action items against software development from technical & management reviews tracked & brought to closure? (2) Are management reviews being used as planned to access the software development process?
10.4.3 Technical Reviews	2	912	Is the documented process for reviewing and assessing software work products being followed?
10.6.1 Process Assessment	3	918	Are the planned peer reviews for the program consistent with internal peer review standards and procedures?
10.6.2 Process Improvement	2	920	Are a set of quality management methods (such as six sigma) applied to software development processes on a regular basis?
10.7 Test/Validation Plans	2	922	Has a well defined systematic approach to IIV&V (Internal Independent Verification and Validation) for software been documented for use on the program?
11.1 Requirements Management Plan	1	926	Has the Software RMP led to development of a fully allocated software requirements baseline?
	2	1379	Does the Requirement Management Plan contain the following: a description of the requirements management process, requirements acceptance criteria, requirements management tools description, requirements management measures, requirements management reports, requirements traceability strategy, and a requirements repository structure?

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Maturity Element Name	Score	ID	Criteria Statements
			Software Interface Design Description (SIDD)

Artifact Description Describes the software interface characteristics pertaining to one or more system, subsystem, hardware item, software item, or other system component. Safety-critical items shall be clearly identified for traceability. Content includes: a) Generic description information; b) External interface identification; c) Software component identification; d) Software unit identification; e) External-software item interface definition (e.g., source language, diagrams); f) Software item-software item interface definition (e.g., source language, diagrams); g) Software component-software component interface definition (e.g., source language, diagrams).

Artifact Creator: Developer

Maturity Element Name	Score	ID	Criteria Statements
Draft *at PDR2*			
B. External interface identification	1	1361	Have the external interfaces for all software items and their components been identified and adequately defined in the top-level design? Can the level of information support detailed design of all interfaces?
F. Software item-software item interface definition (e.g., source language, diagrams)	1	501	Are all software item-to-software item interfaces adequately defined in the top-level design to support detailed design of the interface? Have all information assurance requirements been adequately addressed?
H. Design Methodology	2	509	Has the top-level design been clearly described and how it meets requirements?
J. Communication methods	2	525	Does the top-level design adequately address communication methods for data elements?
Final *at CDR*			
F. Software item-software item interface definition (e.g., source language, diagrams)	1	1382	Have all internal software item-to-software item and component-to-component interfaces been articulated in sufficient detail in the detailed design and are they traceable from higher level documents? Have all information assurance requirements been adequately addressed?
I. Data Element Description	2	1376	Does the detailed design adequately address source data elements and recipient data elements, including communication methods?
K. Interface error types and error handling requirements	1	1383	Have software item, component, software unit and all associated interface error types and error handling requirements been articulated clearly within the design to enable implementation?
Update *at IRR*			
K. Interface error types and error handling requirements	1	531	Have any changes in interface error types or error handling occurred since CDR? Are they articulated clearly enough to enable implementation and validation?
Update *at SVR*			
K. Interface error types and error handling requirements	2	532	Are interface error types and error handling requirements articulated clearly enough within the design to support maintenance of the software during life cycle sustainment?

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Maturity Element Name	Score	ID	Criteria Statements

Software Product Baseline

Artifact Description Contains the source code, executable software, and software support information, including "as built" design information and compilation, build, and modification procedures, for a Computer Software Configuration Item (CSCI) or multiple CSCIs. It can be used to order the executable software and/or source files for the CSCI(s) and is the primary software support document for the CSCI(s). If firmware is part of the delivery, then a Firmware Support Manual should be included as an Appendix. Safety critical source code shall be clearly identified for traceability. All source code builds shall be validated to ensure that they produce the executable code being delivered. COTS/NDI shall be delivered on original Licensed Media. Source code shall be delivered in the native electronic format. Executable software includes all files for each final Software Build, including any batch files, command files, data files, or other software files needed to install and operate the software on its target computer(s). All executables shall be validated to confirm that they exactly match the output of the source code build process. Executable software shall be delivered in the native electronic format.

Artifact Creator: Developer

Draft   *at IRR*

Maturity Element Name	Score	ID	Criteria Statements
A.1. Source Code - Delivered in the native electronic format	3	1448	Has the source code for all CSCIs involved in integration testing been delivered in an appropriate native electronic format?
A.3. Source Code - Safety critical source code shall be clearly identified for traceability	1	1447	Has all safety critical code for each CSCI in the system involved in integration testing been clearly and appropriately identified?
B.1. Executable Software - Delivered in the native electronic format	1	1446	Has the executable software for all CSCIs involved in integration testing been delivered in an appropriate native electronic format?

Update   *at TRR*

Maturity Element Name	Score	ID	Criteria Statements
A.1. Source Code - Delivered in the native electronic format	3	959	Has the source code for all CSCIs involved in system testing been delivered in an appropriate native electronic format?
A.2. Source Code - Validated to ensure that Builds provide the same executable code as that delivered	1	961	Has the delivered source code for all CSCIs involved in system testing been put under configuration control and validated to ensure that software Builds generated provide the same executable code as that delivered by the developer?
A.3. Source Code - Safety critical source code shall be clearly identified for traceability	2	963	Has all safety critical code for each CSCI in the system involved in system testing been clearly and appropriately identified?
B.1. Executable Software - Delivered in the native electronic format	1	969	Has the executable software for all CSCIs involved in system testing been delivered in an appropriate native electronic format?

Final   *at PRR*

Element Name	Score	ID	Criteria Statements
A.2. Source Code - Validated to ensure that Builds provide the same executable code as that delivered	1	962	Has the final source code for all CSCIs in the system to be deployed been validated to ensure that software Builds generated provide the same executable code as that delivered by the developer?
A.3. Source Code - Safety critical source code shall be clearly identified for traceability	1	964	Has all safety critical code for each CSCI in the final system been clearly and appropriately identified?
B.2. Executable Software - Includes all files for each final Build, including any batch files, command files, data files, or other software files needed to install and operate the software on target computer(s)	1	972	Does the delivered executable software for each CSCI in the system include all batch files, command files, data files, or other software files needed to install and operate the software on target computer(s)?
B.3. Executable Software - COTS/NDI shall be delivered on original Licensed Media	2	1398	Has linkable or executable COTS/NDI software associated with each CSCI in the system been delivered on original Licensed Media? Has source code for all Open Source COTS and NDI software been delivered on original Licensed Media?
C. Software support information	1	976	Has all necessary software support information been delivered to the Navy?
C.1. Software support information; includes: "As built" design information	2	978	Has all "as built" design information necessary for life cycle maintenance been delivered?
C.2. Software support information; includes: Compilation, build, and modification procedures	1	980	Has all compilation, build, and modification procedures necessary for life cycle maintenance been delivered?

SETR Criteria - Artifacts created by the Developer
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Software Test Plan (STP)

Maturity Element Name	Score	ID	Criteria Statements
Artifact Description			Describes the plan for qualification testing of software Configuration Items (CIs) and software systems. It describes the tests at a high level, including the software requirements covered by each test (as a traceable allocation from system requirements), together with the test environment and test personnel requirements. It describes the problem reporting and resolution procedures, and provides schedules for test activities. There is usually a single STP for a project. The STP enables the acquirer to assess the adequacy of planning for CSCI and, if applicable, software system qualification testing.
Artifact Creator:			Developer

Draft *at* PDR2

Maturity Element Name	Score	ID	Criteria Statements
B. Test Resources	2	283	(1) Do the resources listed below map to test schedule? (2) Are mitigation plans in place to address any critical dependencies between schedule and resources?
B.1. Test Resources: Personnel	3	286	(1) Have required personnel been identified to support test schedule? (2) Can the identified personnel support need dates?
B.2. Test Resources: Participating Organizations	3	289	Have the participating organizations required to approve software test plan been identified (including ESOH and Software System Safety)?
B.3. Test Resources: Training	3	292	(1) Have training options been identified to provide necessary skills? (2) Are training plans defined and in place?
B.6. Test Resources: Environment	2	301	Have the necessary and desired properties of the test environment been specified?
D. Test Scope	2	1351	Does the identified test approach for each major group of features or feature combinations, ensure that these feature groups are adequately tested? Does the identified test scope contain sufficient detail to permit identification of the major testing tasks and estimation of the time required to do each one?
D.1. Test Scope - What Will Be Tested and What Won't Be	4	310	For tested: (1) Have all software CI's, including features and combinations of software features to be tested, been identified? (2) Have the test design specifications associated with each feature and each combination of features been identified? (3) Does testing adequately cover all external interfaces? For not tested: (1) Have all features and significant combinations of features that will not be tested been identified? (2) Does valid rationale exist for all features and significant combinations of features that will not be tested?
E.4. Test Approach - Data Recording, Reduction, and Analysis	3	331	Have the data recording requirements been documented?
G. Test Schedule	2	349	(1) Have significant constraints on testing such as test item availability, testing resource availability, and deadlines been identified? (2) Does the software test schedule support the overall project schedule? (3) Do the identified test milestones have any critical dependencies relative to test resources?

Element Name	Score	ID	Criteria Statements

Final   *at CDR*

B. Test Resources	**2**	*1373*	Have the necessary test resources been identified and procured, including training of test personnel, test tools (including reduction/analysis tools), test equipment, and test environment?
B.2. Test Resources: Participating Organizations	**2**	*290*	Have the required participating organizations (including ESOH and Software System Safety) approved the software test plan?
D.1. Test Scope - What Will Be Tested and What Won't Be	**3**	*311*	Does the STP clearly specify the scope of the testing, including areas that will be tested and those that will not be tested?
D.2. Test Scope - Breadth and Depth of Coverage / How Sufficiency of Testing Will Be Assured	**3**	*314*	(1) Has the desired minimum degree of comprehensiveness been specified? (2) Have the techniques that will be used to judge the comprehensiveness of the testing effort (e.g., determining which statements have been executed at least once) been identified? (3) Have any additional completion criteria (e.g., error frequency) been specified?
D.3. Test Scope - Planned Tests (an overview of each test case, including its unique identifier)	**2**	*317*	Have all test cases been identified?
E.1. Test Approach - Test Levels and Classes of Software Tests	**3**	*323*	Have all the test levels and classes been defined? (for example: software subsystem, component, unit)
E.3. Test Approach - Test Progression	**3**	*329*	(1) Have test progression methods/metrics been identified? (2) Does the government team have access to the methods/metrics to accurately measure test progression?
E.5. Test Approach - Pass/Fail Criteria	**3**	*335*	(1) Have the criteria to be used to determine whether each test item has passed or failed testing been identified? (2) Are expected results defined?
F.2. Reports - Problem Reporting	**2**	*347*	Has the process for software test problem/trouble reporting been documented?

SETR Criteria - Artifacts created by the Developer
Enclosure (5) of Supplement to the Guidebook for Acquisition of Naval Software Intensive Systems
(v 1.0 September 2010)

Maturity Element Name	Score	ID	System/Software Integration Plan Criteria Statements

Artifact Description Contains details regarding how the software will be built up over time to reach full capability in consonance with the target hardware. Captures the evolution of software component to software component integration, CSCI to CSCI integration, and CSCI to HWCI integration. Includes an integration schedule with milestones and dependencies. Specifies the staffing and facility resources needed to successfully execute the Plan.

Artifact Creator: Developer

Draft *at PDR2*

Maturity Element Name	Score	ID	Criteria Statements
E. Roles and Responsibilities	2	139	Have all participant roles and responsibilities been identified based on requirements (to include contractor and government obligations for development, integration, and all testing)?
F. Integration Risks and Issues	1	141	Are software integration risks/issues identified clearly? Are the risks ranked correctly? Is the likelihood and consequence of each risk assessed correctly? Is the mitigation plan for each risk actionable and does it include a schedule of completion?
G. Integration Strategy	2	143	Are all software items covered? Are all technologies being used identified? Are all connectivity issues addressed?
H.1. Integration Testing: Test requirements	3	147	Are integration test requirements clear, consistent, repeatable and measurable?
K. Traceability	2	161	Is there a plan to map integration requirements within the RTM?

Final   *at IRR*

Element Name	Score	ID	Criteria Statements
F. Integration Risks and Issues	2	*142*	Has the risk database been updated for changes to software integration risks?
G. Integration Strategy	3	*144*	Has the integration strategy been updated to reflect changes in the software architecture?
H.1. Integration Testing: Test requirements	2	*148*	Have the test requirements been updated to reflect the integration test requirements?
H.2. Integration Testing: Test procedures	1	*150*	Are integration test objectives clearly defined and are all the software versions, equipment, and configuration items defined?
H.3. Integration Testing: Test data	2	*152*	Do plans adequately cover the management and analysis of all integration test data, including data collection, storage, and transport?
H.5. Integration Testing: Test schedule	2	*1374*	Does the test schedule meet the following characteristics: realistic; agreed to by all stakeholders; shows interdependencies, critical path, and test phases; identifies significant constraints; and reflects any changes since PDR?
I. Tools	3	*158*	Have all tools been defined and verified? Has a process been established to accredit the tools? Has the team been trained on how to use the tools and what to expect from them?
J. Acceptance Criteria	1	*160*	Are system and software integration acceptance criteria clearly defined?
K. Traceability	1	*162*	Do test objectives map to requirements? Have all integration requirements been mapped to a test procedure?

SETR Criteria - Artifacts created by the Developer
Enclosure (5) of Supplement to the Guidebook for Acquisition of Naval Software Intensive Systems
(v 1.0 September 2010)

Maturity Element Name	Score	ID	Test Procedures/Scripts/Cases Criteria Statements
Artifact Description			The software Test Procedures/Scripts/Cases provide the specific scripts to be executed for each of the tests described in the Software Test Plan, together with the step-by-step procedures to be executed during each test case. Most of the steps described in the procedure should be accompanied by an expected result, including upper and lower bounds for determining a "pass" status when applicable, in order to satisfy the system or SW requirement being addressed. (The test procedures should conform to applicable test standards.)
Artifact Creator:			Developer

Final   *at CDR*

Maturity Element Name	Score	ID	Criteria Statements
C. Identification of test configuration	**1**	*395*	Have all system/software tools, set-up, version, scenario (input test data), simulators, and interfaces been clearly defined?
D. Relationship/Traceability to Software Test Plan	**2**	*397*	Do all the test objectives defined in the Software Test Plan (what will be tested) have a corresponding test procedure/step?
F. Test preparations (hardware, software, other) for each test	**2**	*401*	Does the test procedure clearly define all set-up, configuration, version, tools, simulators, and the scenario (input data) that will be used?
G. Test descriptions including	**1**	*1380*	Have all requirements (for which testing was the prescribed verification method) been covered by the test procedures, and does each test procedure clearly indicate what requirements are being tested and what criteria will be used to evaluate results? Do the test procedures cover all external interfaces?
G.6. Test descriptions including - Expected test results	**2**	*415*	Is each expected result clearly defined to include a pass/fail criteria?

Update   *at IRR*

Maturity Element Name	Score	ID	Criteria Statements
C. Identification of test configuration	**1**	*1437*	Have all system/software tools, set-up, version, scenario (input test data), simulators, and interfaces been clearly defined?
D. Relationship/Traceability to Software Test Plan	**2**	*1439*	Do all the test objectives defined in the Software Test Plan (what will be tested) have a corresponding test procedure/step?
F. Test preparations (hardware, software, other) for each test	**2**	*1438*	Does the test procedure clearly define all set-up, configuration, version, tools, simulators, and the scenario (input data) that will be used?
G. Test descriptions	**1**	*1436*	Have all requirements (for which testing was the prescribed verification method) been covered by the test procedures, and does each test procedure clearly indicate what requirements are being tested and what criteria will be used to evaluate results?
G.6. Test descriptions including - Expected test results	**2**	*1440*	Is each expected result clearly defined to include a pass/fail criteria?

Supplement to Guidebook for Acquisition of Naval Software Intensive Systems

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Enclosure (6). SETR criteria for artifacts created by the Government and Developer

This enclosure provides SETR criteria statements for artifacts where responsibility and configuration control passes between the Government and the Developer through the acquisition lifecycle. In some cases, the Government creates the initial draft, and configuration control passes to the Developer after Milestone-B. In other cases the control over the artifact is set based on the discretion of the program manager.   See Section 4.2, Table 2, and Table 3 of this supplement for more information. The artifact creator is noted with each artifact. The artifacts in this category are the following:

<div align="center">

Computer Software Configuration Items (CSCIs)

Software Life Cycle Sustainment Plan

Software Requirements Description (SRD)

Software Requirements Traceability Matrix (RTM)

Software Risks/Mitigation Plans

Test Problem/Trouble Report

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SETR Criteria - Artifacts that are created by Government and/or Developer

Enclosure (6) of Supplement to the Guidebook for Acquisition of Naval Software Intensive Systems

Maturity Element Name	Score	ID	Computer Software Configuration Items (CSCIs) Criteria Statements
Artifact Description			Refers to the annotated list of computer software configuration items (CSCIs) (i.e., a listing that identifies each CSCI and includes a clear and concise capability-based description for each CSCI) that will make up the Software Product Baseline. This information is maintained and kept current throughout the development. It is included in Plans (e.g. the SDP) to document the software allocation and will be used and discussed in a variety of programmatic briefings and technical interchanges throughout the development cycle.
Artifact Creator:			Government then Developer
Draft *at SFR*			
A. Label: Name and traceable unique identifier	1	697	Have the names of each CSCI intended to be a part of the planned system been documented?
B. Purpose/Scope: Clear and concise capability-based description	1	701	Have clear and concise capability-based descriptions of key CSCIs of the planned system been documented?
C. Interfaces: Other CSCIs required and/or linked to	3	705	For each key CSCI, have interfaces with other CSCIs been identified?
Update *at SSR*			
B. Purpose/Scope: Clear and concise capability-based description	2	1411	For key CSCIs, have their description and their interfaces with other CSCIs been updated since the last SETR, if necessary?
Update *at PDR1*			
A. Label: Name and traceable unique identifier	4	1275	Has a traceable unique identifier been assigned for each CSCI that is to be a part of the system?
B. Purpose/Scope: Clear and concise capability-based description	1	1370	For key CSCIs, have their description and their interfaces with other CSCIs been updated since the last SETR, if necessary?
Update *at PDR2*			
A. Label: Name and traceable unique identifier	4	698	Has a traceable unique identifier been assigned for each CSCI that is to be a part of the system?
B. Purpose/Scope: Clear and concise capability-based description	2	1371	For key CSCIs, have their description and their interfaces with other CSCIs been updated since the last SETR, if necessary?
D. Input/Output: Include results transformed from source as specified in software configuration management index	1	710	Have all external inputs and outputs been documented for each CSCI that is to be a part of the system?
Final *at CDR*			
E. Data Integrity: Data integrity check data	3	715	Has an appropriate means of data integrity been defined for all external inputs and outputs for each CSCI in the system?

Maturity				Software Life Cycle Sustainment Plan
Element Name	**Score**	**ID**	**Criteria Statements**	

Artifact Description The software LCSP usually becomes an appendix to the system LCSP, providing the necessary software detail. The LCSP is developed and included as a part of the Acquisition Strategy to document how the sustainment strategy is being implemented. The LCSP is an evolutionary document begun by the government during the Materiel Solution Analysis Phase as a strategic framework for obtaining optimal sustainment at minimal LCC. The developer evolves it into an execution plan for how sustainment is applied, measured, managed, assessed, and reported after system fielding. By Milestone C, it should contain details on how the program is fielding integrated logistic elements to meet readiness targets, sustain system performance capability threshold criteria, mitigating operating and support (O&S) costs, reducing the logistics footprint, and complying with environmental and other logistics related regulations.

Artifact Creator: Government then Developer after Milestone B

Draft *at PDR1*

A. The overall software support concept and performance-based sustainment strategy	**2**	*1359*	Has an appropriate software support concept and performance-based sustainment strategy been documented as part of the program's overall acquisition strategy and system design process?

Final *at SVR*

C. How the software sustainment metrics will be achieved and sustained throughout the life cycle	**2**	*94*	Have appropriate software sustainment metrics for the life cycle been identified and are they currently being achieved? Do the metrics include the four mandatory software metrics documented in the Naval Software Intensive System Acquisition Guidebook (Size/Stability, Cost/Schedule, Quality, and Organization)?

Update *at PRR*

D. The funding required and budgeted by year and appropriation for the software sustainment cost category consistent with the Acquisition Program Baseline	**2**	*100*	Has required funding been identified and budgeted by year; and, is appropriation for the software sustainment cost category consistent with the Acquisition Program Baseline?

Maturity			Software Requirements Description (SRD)
Element Name	**Score**	**ID**	**Criteria Statements**

Artifact Description	Specifies the requirements for a Computer Software Configuration Item (CSCI) or multiple CSCIs and the methods to be used to ensure that each requirement has been met. The SRD includes the SW Requirements Specification (SRS) and the Interface Requirements Spec (IRS). External interface requirements may be presented in the SRS or in one or more IRSs referenced from the SRS. The SRS/IRSs are used as the basis for design and qualification testing of a CSCI. The IRS specifies the requirements imposed on the HW/SW interface, and the interfaces between software. Includes: system identification and overview; CSCI functionality; requirements for interfaces external to CSCI; qualification requirements; safety, security and privacy specifications; human-factors engineering requirements; data definition and database requirements; installation/acceptance requirements of the delivered software product at the operation and maintenance site(s); user documentation/operation and execution/maintenance requirements; software quality characteristics; design and implementation constraints; computer resource requirements; packaging requirements; requirements precedence and criticality; and requirements traceability.
Artifact Creator:	Government or Developer at program office discretion

Draft *at SSR*

Element Name	Score	ID	Criteria Statements
C. Required states and modes	2	*1261*	Is each state and mode clearly identified and defined and is the correlation between them clearly articulated in the requirements?
D.1. Functionality of the software item, including performance requirements	1	*1262*	Are the performance requirements, including KPP's and KSA's clearly articulated? Is the traceability from higher level documents (CONOPS, CDD, etc) clear? Has the Safety lead / Principal for Safety reviewed the requirements for any safety-critical or safety risk items?
F. Requirements for interfaces external to software item	2	*1413*	Have all external interfaces been identified (including communication paths required to implement IERs) and are they traceable from higher level documents and comply with interoperability specifications and standards? Have external stakeholders been given the ability to review and approve external interfaces? Have all information assurance requirements been adequately addressed?
S. Computer resource requirements	2	*1454*	Have sizing requirements (including main memory and auxiliary memory) been identified?
V. Requirements traceability	2	*1414*	Are all software requirements traceable to the Systems Design Specification (SDS) and interoperability specifications and standards, to include processing accuracy, precision, capacity, latency, and execution time requirements?

Update *at PDR1*

Element Name	Score	ID	Criteria Statements
E. Requirements analysis approach/methodology	1	*1263*	Is the requirements analysis methodology clearly articulated? Does the requirements analysis methodology require that all requirements be documented in clear (unambiguous and complete), appropriate, implementable, verifiable/testable, and countable manner? Does the requirements analysis methodology support the development methodology?
	2	*1355*	Are software requirements articulated in sufficient detail to be supported in the detailed design, including specifications for safety, security and privacy, and human-equipment interactions? Have appropriate stakeholders identified their requirements? Are they traceable from higher level documents?
F. Requirements for interfaces external to software item	1	*1264*	Are external interface requirements articulated in sufficient detail to be supported by the detailed design and are they traceable from higher level documents? Have all information assurance requirements been adequately addressed?
G. Qualification requirements	1	*1265*	Are the software qualification requirements clearly articulated and do they support a clear approach to software test planning for qualification?
Q. Software quality characteristics	4	*1269*	Has a comprehensive set of software quality characteristics been clearly articulated to support detailed design?
R. Design and Implementation Constraints	2	*1357*	Are design and implementation constraints, including computer resource requirements, articulated in the software requirements in sufficient detail to ensure they will be adequately addressed in the detailed design of the software?
V. Requirements traceability	2	*1272*	Are all software requirements documented in a clear (unambiguous and complete), appropriate, implementable, verifiable/testable, and countable manner so that they can be traced to design, implementation, and test? Are they traceable to the Systems Design Specification (SDS)?

Update   *at PDR2*

Element Name	Score	ID	Criteria Statements
C. Required states and modes	**1**	*585*	Is each state and mode clearly identified and defined and is the correlation between them clearly articulated in the requirements?
D.1. Functionality of the software item, including Performance requirements	**3**	*593*	Are the performance requirements, including KPP's and KSA's clearly articulated? Is the traceability from higher level documents (CONOPS, CDD, etc) clear?
E. Requirements analysis approach/methodology	**1**	*1356*	Are software requirements articulated in sufficient detail to be supported in the detailed design, including specifications for safety, security and privacy, and human-equipment interactions? Have appropriate stakeholders identified their requirements? Are they traceable from higher level documents?
	1	*605*	Is the requirements analysis methodology clearly articulated? Does the requirements analysis methodology require that all requirements be documented in clear (unambiguous and complete), appropriate, implementable, verifiable/testable, and countable manner? Does the requirements analysis methodology support the development methodology?
F. Requirements for interfaces external to software item	**1**	*609*	Are external interface requirements articulated in sufficient detail to be supported by the detailed design and are they traceable from higher level documents? Have all information assurance requirements been adequately addressed?
G. Qualification requirements	**3**	*613*	Are the software qualification requirements clearly articulated and do they support a clear approach to software test planning for qualification?
Q. Software quality characteristics	**4**	*669*	Has a comprehensive set of software quality characteristics been clearly articulated to support detailed design?
R. Design and Implementation Constraints	**2**	*1358*	Are design and implementation constraints, including computer resource requirements, articulated in the software requirements in sufficient detail to ensure they will be adequately addressed in the detailed design of the software?
V. Requirements traceability	**1**	*689*	Are all software requirements documented in a clear (unambiguous and complete), appropriate, implementable, verifiable/testable, and countable manner so that they can be traced to design, implementation, and test? Are they traceable to the Systems Design Specification (SDS)?

Element Name	Score	ID	Criteria Statements

Final   *at CDR*

Element Name	Score	ID	Criteria Statements
C. Required states and modes	**3**	*586*	Have all updates or changes to system states and modes since PDR been clearly identified and defined and is the correlation between them clearly articulated in a testable manner?
D.1. Functionality of the software item, including performance requirements	**1**	*594*	Have all updates or changes to the performance requirements since PDR been clearly articulated? Are all performance requirements either testable or verifiable by an appropriate means? Have the software requirements been baselined and put under Configuration Control by the Program Office?
E. Requirements analysis approach/methodology	**3**	*606*	Have changes or updates to the requirements analysis methodology since PDR been clearly articulated and do they support the development methodology?
F. Requirements for interfaces external to software item	**1**	*1381*	Have the external interfaces for all software items, components, and their software units been articulated in sufficient detail in the detailed design and are they traceable from higher level documents? Have all information assurance requirements been adequately addressed?
G. Qualification requirements	**3**	*614*	Have all changes or updates to the software qualification requirements since PDR been clearly articulated and do they support implementation in software test procedures for qualification?
H. Safety specifications, including those related to methods of operation and maintenance, environmental influences, and personnel injury	**2**	*618*	Since PDR, have all changes or updates to safety specifications impacting software requirements been articulated in sufficient detail to be supported by the software implementation and are they traceable from higher level documents?
I. Security and privacy specifications, including those related to compromise of sensitive information	**2**	*622*	Since PDR, have all changes or updates to security and privacy specifications impacting software requirements been articulated in sufficient detail to be supported by the software implementation and are they traceable from higher level documents?
J.3. Human-factors engineering (ergonomics) requirements, including those for Constraints on personnel	**3**	*638*	Are constraints on personnel articulated in sufficient detail in the software requirements to be accounted for in implementation and test planning and procedures?
J.4. Human-factors engineering (ergonomics) requirements, including those for Areas that need concentrated human attention and are sensitive to human errors and training	**3**	*642*	Are areas of operation requiring concentrated human attention articulated in sufficient detail in the software requirements to be accounted for in test planning and procedures and operator training material?
N. User documentation requirements	**3**	*658*	Are user documentation requirements clearly articulated in the documented software requirements?
O. User operation and execution requirements	**3**	*662*	Are user operation and execution requirements articulated in sufficient detail in the software requirements to be accounted for in test planning and procedures and operator training material?
R. Design and implementation constraints	**1**	*674*	Are design and implementation constraints articulated in the software requirements in sufficient detail to ensure they will be adequately addressed in the implementation of the software?

Element Name	Score	ID	Criteria Statements

Final *at CDR*

S. Computer resource requirements	**1**	*678*	Are computer resource requirements articulated in the software requirements in sufficient detail to ensure they will be adequately addressed in the implementation of the software?
U. Precedence and criticality of requirements	**2**	*686*	Does the detailed design reflect requirements precedence and criticality?
V. Requirements traceability	**1**	*690*	Have all updates or changes to the software requirements since PDR been documented in a clear (unambiguous and complete), appropriate, implementable, verifiable/testable, and countable manner so they can be traced to design, implementation, and test? Are they traceable to the Systems Design Specification (SDS)?
W. Rationale	**3**	*694*	Has rationale for all derived software requirements been clearly stated?

Update *at IRR*

G. Qualification requirements	**3**	*1432*	Have all changes or updates to the software qualification requirements since CDR been clearly articulated and do they support implementation in integration test procedures for qualification?
J.3. Human-factors engineering (ergonomics) requirements, including those for constraints on personnel	**3**	*1434*	Are constraints on personnel articulated in sufficient detail in the software requirements to be accounted for in implementation and test planning and procedures?
J.4. Human-factors engineering (ergonomics) requirements, including those for areas that need concentrated human attention and are sensitive to human errors and training	**3**	*1435*	Are areas of operation requiring concentrated human attention articulated in sufficient detail in the software requirements to be accounted for in test planning and procedures and operator training material?
L. Installation and acceptance requirements of the delivered software product at the operation site(s)	**1**	*1449*	Have installation and acceptance requirements for the delivered software product been articulated in sufficient detail to be addressed in software installation and checkout procedures for at all planned integration test facilities?
O. User operation and execution requirements	**3**	*1433*	Are user operation and execution requirements articulated in sufficient detail in the software requirements to be accounted for in test planning and procedures and operator training material?

Update *at TRR*

L. Installation and acceptance requirements of the delivered software product at the operation site(s)	**1**	*651*	Have installation and acceptance requirements for the delivered software product been articulated in sufficient detail to be addressed in software installation and checkout procedures for at all planned system test facilities?

Update   *at*   *SVR*

Element Name	Score	ID	Criteria Statements
I. Security and privacy specifications, including those related to compromise of sensitive information	1	624	Since CDR, have all changes or updates to security and privacy specifications been approved by a Navy Configuration Control Board? Have approved changes impacting software requirements been articulated in sufficient detail to be supported by the software implementation and are they traceable from higher level documents?
J. Human-factors engineering (ergonomics) requirements	2	1393	Have human-factors engineering requirements for all software items in the system, along with updates and changes to them, been documented adequately to support operational deployment and life cycle sustainment of the system?
J.4. Human-factors engineering (ergonomics) requirements, including those for areas that need concentrated human attention and are sensitive to human errors and training	2	1394	Since CDR, have all changes or updates to human performance requirements been approved by a Navy Configuration Control Board? Have changes been approved and articulated in sufficient detail in the software requirements to support operational deployment and life cycle sustainment?
K. Data definition and database requirements, including installation-dependent data for adaptation needs	2	648	Have requirements for installation-dependent adaptation data been articulated in sufficient detail to be addressed in software installation and checkout procedures?
L. Installation and acceptance requirements of the delivered software product at the operation site(s)	2	652	Have installation and acceptance requirements for the delivered software product been articulated in sufficient detail to be assessed and accepted by the customer?
N. User documentation requirements	3	660	Since CDR, have any changes to user documentation requirements been clearly articulated in the documented software requirements?
O. User operation and execution requirements	1	664	Does the as-built system satisfy user operation and execution requirements?
T. Packaging requirements	2	684	Are the software packaging requirements articulated in sufficient detail in the software requirements to ensure the as-built system will satisfy them?

SETR Criteria - Artifacts that are created by Government and/or Developer

Enclosure (6) of Supplement to the Guidebook for Acquisition of Naval Software Intensive Systems

Software Requirements Traceability Matrix (RTM)

Maturity Element Name	Score	ID	Criteria Statements
Artifact Description			Requirements Traceability Matrix mapping requirements vertically from spec to spec (multiple tiers), spec to design, design to test, and return. Horizontal traceability should represent dependencies between components. Contractor format acceptable. Traceability matrix could be in the form of DOORS reports or Excel spreadsheets depending on the Program and its complexity.
Artifact Creator:			Government then Developer after Milestone B
Draft *at* **PDR1**			
A. Requirement ID	**3**	*1258*	Does each software requirement have a unique identifier for traceability?
B. Requirement Text	**2**	*1259*	Is the text for all software requirements captured in the traceability matrix?
C. Traces From	**2**	*1260*	(1) Do all software requirements have a parent system requirement? (2) Do all of the system requirements that need to be mapped to software have a child or children requirement(s)?
Update *at* **PDR2**			
A. Requirement ID	**3**	*108*	Does each requirement have a unique ID?
B. Requirement Text	**1**	*112*	Is the text for all software requirements captured in the traceability matrix?
C. Traces From	**1**	*116*	(1) Do all software requirements have a parent system requirement? (2) Do all of the system requirements that need to be mapped to software have a child or children requirement(s)?
Final *at* **CDR**			
D. Traces To	**1**	*121*	(1) Do all software requirements trace to a design element? (2) Do all design elements have a parent software requirement? (3) Have all requirements, including interface / integration requirements, been traced to test procedures and other verification methods? 4) Do all design elements trace to a code component(s)? 5) Do all code components have a parent design element(s)?
E. Verification Method	**1**	*127*	Has a valid verification method (test, inspection, demonstration, analysis) been identified for all software requirements?
Update *at* **IRR**			
F. Verification Results	**1**	*1450*	Have all software requirements passed verification? Is software ready for integration testing including adequate documentation on operator interfaces?
Update *at* **TRR**			
F. Verification Results	**1**	*1385*	Have all software requirements passed verification? Is software ready for system-level testing including adequate documentation on operator interfaces?

SETR Criteria - Artifacts that are created by Government and/or Developer

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Maturity Element Name	Score	ID	Software Risks/Mitigation Plans Criteria Statements
Artifact Description			Contractor format is acceptable. Risks are identified and characterized by a clear and concise title, risk description, risk score, responsible risk manager(s), and risk impacts/dependencies as well as strategies to address the identified risks. Additional tracking tools include risk cubes (Likelihood vs. Consequence) and risk mitigation plans (tasks vs. time) in the form of waterfall charts. Mitigation plans identify required steps to be taken to reduce the risk from Red/Yellow (unacceptable range) to Green (acceptable range).
Artifact Creator:			Government then Developer after Milestone B
Draft *at SRR1*			
E.3 Risk Management Plan - Strategy	3	225	Has a clear risk management strategy, assessment, and reporting process been documented? Does the strategy address stakeholder interaction?
Final *at SRR2*			
E.1 Risk Management Plan - Roles and Responsibilities	3	216	Does the plan contain a complete listing of project roles and responsibilities assigned for the software risk management activities?
E.2 Risk Management Plan - Tools	2	221	Are Risk Tools identified in support of the software risk management activities?
F.2 Risk Handling - Risk Assessment	1	276	Have all risks been assessed so that high level risks are being properly mitigated?
F.3 Risk Handling - Identified Risks	3	236	Are risks associated with development, integration, testing, fielding, and maintenance, including program execution and performance being identified? Are Information Assurance security risks associated with programming languages and architectures covered?
F.4 Risk Handling - Mitigation Strategy	1	241	Do all high-priority risks have a documented mitigation strategy?
F.4.d Risk Handling - Mitigation Strategy - Avoid	2	261	Have software risks been identified that will be avoided, along with an avoidance strategy for each risk?
F.4.e Risk Handling - Mitigation Strategy - Control	2	266	Have software risks been identified that will be controlled, along with a control strategy for each risk?
F.5 Risk Handling - Reports	2	271	Are software risks and their mitigation status being reported according to plan?

Element Name	Score	ID	Criteria Statements
Update *at SFR*			
F.3 Risk Handling - Identified Risks	**2**	*237*	Have any software risks associated with the program been added or updated? If so, what were the changes?
F.4 Risk Handling - Mitigation Strategy	**1**	*242*	Are software risk mitigation strategies being reviewed and updated as necessary?
F.4.a Risk Handling - Mitigation Strategy - Transfer	**1**	*247*	Have significant software risks been identified that are potential candidates for transfer to or from other organizations?
F.4.c Risk Handling - Mitigation Strategy - Monitor	**1**	*257*	Have software risks been identified that will be monitored on a continuous basis?
F.4.d Risk Handling - Mitigation Strategy - Avoid	**2**	*262*	Have any changes been made to software risks that are to be avoided? If so, what changes were made?
F.4.e Risk Handling - Mitigation Strategy - Control	**2**	*267*	Have any changes been made to software risks that are to be controlled? If so, what changes were made?
F.5 Risk Handling - Reports	**2**	*272*	Are software risks and their mitigation status being reported according to plan?
Update *at SSR*			
F.3 Risk Handling - Identified Risks	**2**	*1421*	Have any software risks associated with the program been added or updated since the last SETR? If so, what were the changes?
F.4 Risk Handling - Mitigation Strategy	**1**	*1417*	Are software risk mitigation strategies being reviewed and updated as necessary?
F.4.a Risk Handling - Mitigation Strategy - Transfer	**1**	*1415*	Have any significant software risks been identified since the last SETR that are potential candidates for transfer to or from other organizations?
F.4.c Risk Handling - Mitigation Strategy - Monitor	**1**	*1416*	Have any new software risks been identified since the last SETR that will be monitored on a continuous basis?
F.4.d Risk Handling - Mitigation Strategy - Avoid	**2**	*1420*	Have any changes been made to software risks that are to be avoided since the last SETR? If so, what changes were made?
F.4.e Risk Handling - Mitigation Strategy - Control	**2**	*1419*	Have any changes been made to software risks that are to be controlled since the last SETR? If so, what changes were made?
F.5 Risk Handling - Reports	**2**	*1418*	Are software risks and their mitigation status being reported according to plan?
Update *at PDR1*			
F. Risk Handling	**1**	*1352*	Is the program office handling software risks according to a documented strategy? Are software risks continuously being identified, monitored, assessed / reassessed for mitigation and control, and reported?
Update *at PDR2*			
F. Risk Handling	**1**	*1372*	Is the program office handling software risks according to a documented strategy? Are software risks continuously being identified, monitored, assessed / reassessed for mitigation and control, and reported?

Update   *at CDR*

| F.3 Risk Handling - Identified Risks | 1 | 1375 | Have software risks: been identified and accepted by the program ; been added or updated in the SDP or Risk Management Plan since the last review; been reviewed, updated, and reported according to the plan? |

Update   *at IRR*

| F. Risk Handling | 1 | 1451 | Is the program office handling software risks according to a documented strategy? Are software risks continuously being identified, monitored, assessed / reassessed for mitigation and control, and reported? |

Update   *at TRR*

| F. Risk Handling | 1 | 1388 | Is the program office handling software risks according to a documented strategy? Are software risks continuously being identified, monitored, assessed / reassessed for mitigation and control, and reported? |

Update   *at SVR*

| F. Risk Handling | 1 | 1389 | Is the program office handling software risks according to a documented strategy? Are software risks continuously being identified, monitored, assessed / reassessed for mitigation and control, and reported? |

SETR Criteria - Artifacts that are created by Government and/or Developer

Enclosure (6) of Supplement to the Guidebook for Acquisition of Naval Software Intensive Systems

(v 1.0 September 2010)

Maturity Element Name	Score	ID	Criteria Statements
			Test Problem/Trouble Report

Artifact Description Provide a means for identifying and recording the resolution to software anomalous behavior, process noncompliance with plans and standards, and deficiencies in life cycle data. (For use during software subsystem development, system functional testing, FQT, and regression testing.)

Artifact Creator: Government then Developer after Milestone B

Draft *at IRR*

Maturity Element Name	Score	ID	Criteria Statements
C.2. Actual Result	1	1452	Have all required software test reports (subsystem, program, or module) been delivered and reviewed? Regarding all known test problems or trouble reports not yet fixed in the system: has the problem severity been determined and has the expected result been documented for high priority problems?

Update *at TRR*

Maturity Element Name	Score	ID	Criteria Statements
C.2. Actual Result	1	1386	Have all required software test reports (subsystem, program, or module) been delivered and reviewed? Regarding all known test problems or trouble reports not yet fixed in the system: has the problem severity been determined and has the expected result been documented for high priority problems?

Final *at PRR*

Maturity Element Name	Score	ID	Criteria Statements
B. Identification of the software item or software configuration item and/or the software life cycle process in which the problem was observed	1	1396	For all software test problems/trouble reports, has the Software item where the problem occurred been identified along with the requirements not being met? Has the severity of the problem been identified?
C. Description of the problem to enable problem resolution	1	1397	Does the description of the software problem document the expected result, actual result, and steps required to recreate the problem? Have appropriate corrective actions been determined?

Supplement to Guidebook for Acquisition of Naval Software Intensive Systems

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Enclosure (7). SETR criteria for Core Software Metrics

This enclosure provides SETR criteria statements for the Core Software Metrics. See section 5 of this supplement for additional guidance. There are four categories of core metrics:

Software Cost/Schedule

Software Organization

Software Quality

Software Size/Stability

Maturity		*Core Software Metric - Software Cost/Schedule*
Score	**ID**	**Criteria Statements**

Artifact Description Navy policy requires all programs of record with any software (SW) to define, develop, and implement a minimum set of core metrics specific to their program, which includes SW cost/schedule. A predefined performance period should be used to bound the collection and reporting of software cost and schedule data. Various performance periods can be defined and aligned, at the program's discretion, in order to best serve the program's measurement needs across the full acquisition lifecycle. While specific methods of baselining the expectations for SW cost and schedule are allowable, an adequately SW-informed WBS should be its basis and the use of Earned Value Management is highly recommended. The core metrics are relational across the acquirer and developer organizations. They are updated at each SETR with criteria that reflect the changing nature of SW acquisition across the lifecycle and they tie to PoPS metrics that are part of the 2 Pass/6 Gate process. Details on the approach to gathering and using the core metrics should be covered in the SW Measurement Plan.

Artifact Creator: Government or Developer depending on criteria

Applicable *at ITR*

1 *1159* Has a software cost estimates range been developed to address potential capability alternatives, in accord with the capability affordability assessment?

2 *1160* Does AoA Study Guidance direct inclusion of software cost estimates (including rationale for cost estimate approach and involvement of relevant stakeholders, to include requirements stakeholders) in accord with the TOC estimating approach and evaluation criteria?

Applicable *at ASR*

1 *1161* Are AoA software cost estimates for the preferred alternative(s) aligned with TDS objectives and SEP constraints?

2 *1162* Have plans been developed (and integrated with the overall TOC approach) to incorporate appropriate software cost estimating activities across the acquisition timeline?

Applicable *at SRR1*

1 *1324* Are software cost estimating activities on or ahead of schedule? Are they coordinated with the updated affordability assessment, and have cost estimates informed the initial program TOC definition and baseline effort, as applicable? Are stakeholders involved in software cost estimating activities (as appropriate)?

2 *1167* Does the software schedule reflect the industry accepted development and integration time for the percentage of total functionality of the system and complexity of the software for similar systems?

Applicable *at SRR2*

1 *1325* Are software cost estimating activities on or ahead of schedule? Are they coordinated with the updated affordability assessment, and have cost estimates informed the initial program TOC definition and baseline effort, as applicable? Are stakeholders involved in software cost estimating activities (as appropriate)?

2 *1172* Has the software schedule been updated, if applicable, to reflect the industry accepted development and integration time for the percentage of total functionality of the system and complexity of the software for similar systems?

Applicable *at SFR*

2 *1328* Are software cost estimating activities (to include planning for software lifecycle support costs and assessment of TOC implications of any software-related KPPs/KSAs/cost drivers) on or ahead of schedule? Are stakeholders involved (as appropriate)?

3 *1176* Has the software schedule been updated, if applicable, to reflect the industry accepted development and integration time for the percentage of total functionality of the system and complexity of the software for similar systems?

Applicable *at SSR*

1   *1175* Has the Program Office tailored the template/requirements for the Software Development Plan (SDP), including Work Breakdown Structure (WBS) software elements and required four core software metrics, for inclusion in the RFP?

2   *1407* Are software cost estimating activities (to include planning for software lifecycle support costs and assessment of TOC implications of any software-related KPPs/KSAs/cost drivers) on or ahead of schedule? Are stakeholders involved (as appropriate)?

3   *1409* Has the software schedule been updated, if applicable, to reflect the industry accepted development and integration time for the percentage of total functionality of the system and complexity of the software for similar systems?

Applicable *at PDR1*

1   *1181* Does the RFP (via SDP criteria) (and SEP and LCSP as appropriate) include required metrics for tracking software cost/schedule against an approved baseline (to include sustainment phase requirements), including cost and schedule variances and cost and schedule performance indices?

1   *1178* Have cost estimates been completed for critical SDS elements (e.g., software safety and software security)?

3   *1182* Does the schedule reflect the industry accepted development and integration time for the percentage of total functionality of the system and complexity of the software for similar systems?

3   *1179* Have any software-related inconsistencies with the updated Independent Cost Estimate (ICE) been resolved?

3   *1177* Are software cost estimating activities (to include planning for software lifecycle support costs and assessment of TOC implications of any software-related KPP cost drivers; Integrated Development Environment (IDE); access to software development data; and software metrics evidence and artifacts) on or ahead of schedule?

4   *1180* Do RFP selection criteria address government expectations for planning for software lifecycle support costs and assessment of TOC implications of any software-related KPP cost drivers; Integrated Development Environment (IDE); access to software development data; and software metrics evidence and artifacts?

Applicable *at PDR2*

1   *1187* Is software reflected in Work Breakdown Structure (WBS)/Earned Value Management System (EVMS)/equivalent artifacts in sufficient detail to trace to cost and schedule elements in accord with SDP-documented process(es)?

1   *1183* Have software cost and schedule baselines been developed and acceptable variances been identified?

2   *1184* Have preliminary sustainment phase baselines been identified in the LCSP?

3   *1186* Has software data informed the updated program TOC definition and baseline, as applicable?

3   *1185* Have any inconsistencies with the updated ICE been resolved?

Applicable *at CDR*

1   *1191* Are cost/schedule metrics within tolerance or has justification and waiver been approved?

1   *1338* Is the standard process to collect and assess cost/schedule metrics being used? Are variances, trends and performance indices being tracked, analyzed and reported?

3   *1192* Have cost/schedule elements for software sustainment have been detailed in the program Life Cycle Sustainment Plan (LCSP)?

3   *1190* Is the program TOC update informed by assessments of any software-related KPP and KSA cost implications?

Applicable *at IRR*

1   *1425*   Are cost/schedule variances, trends and performance indices being tracked, analyzed and reported? Are cost/schedule metrics within tolerance or has justification and waiver been approved?

3   *1427*   Are assessments of any software-related KPP and KSA cost implications informing the program TOC update?

3   *1428*   Is the standard process to collect and assess cost/schedule metrics being used?

Applicable *at TRR*

1   *1341*   Are cost/schedule variances, trends and performance indices being tracked, analyzed and reported? Are cost/schedule metrics within tolerance or has justification and waiver been approved?

2   *1197*   Has the program LCSP been updated, as needed, with respect to cost/schedule elements for software sustainment?

3   *1193*   Is the standard process to collect and assess cost/schedule metrics being used?

3   *1195*   Are assessments of any software-related KPP and KSA cost implications informing the program TOC update?

Applicable *at SVR*

1   *1344*   Are cost/schedule variances, trends and performance indices being tracked, analyzed and reported? Are cost/schedule metrics within tolerance or has justification and waiver been approved?

2   *1202*   Has the program LCSP been updated, as needed, with respect to cost/schedule elements for software sustainment?

3   *1198*   Is the standard process to collect and assess cost/schedule metrics being used?

3   *1200*   Are assessments of any software-related KPP and KSA cost implications informing the program TOC update?

Applicable *at PRR*

1   *1207*   Has the program LCSP been updated, as needed, with respect to cost/schedule elements for software sustainment?

3   *1206*   Are cost/schedule metrics within tolerance or has justification and waiver been approved?

3   *1205*   Are assessments of any software-related KPP and KSA cost implications informing the program TOC update?

3   *1203*   Is the standard process to collect and assess cost/schedule metrics being used?

3   *1204*   Are cost/schedule variances, trends and performance indices being tracked, analyzed and reported?

Applicable *at PCA*

1   *1212*   Has the program LCSP been updated, as needed, with respect to cost/schedule elements for software sustainment?

3   *1208*   Is the standard process to collect and assess cost/schedule metrics being used?

3   *1209*   Are cost/schedule variances, trends and performance indices being tracked, analyzed and reported?

3   *1210*   Are assessments of any software-related KPP and KSA cost implications informing the program TOC update?

3   *1211*   Are cost/schedule metrics within tolerance or has justification and waiver been approved?

Maturity		

Core Software Metric - Software Organization

Score   ID   Criteria Statements

Artifact Description Navy policy requires all programs of record with any software (SW) to define, develop, and implement a minimum set of core metrics specific to their program, which includes SW organization (staffing). The purpose of this metric is to assess and monitor adequate staffing of key SW personnel billets, to include necessary SW-related knowledge, skills, and abilities (KSAs), via education, training, and experience. Appropriate metrics include tracking the number of SW staff and/or labor hours, the actual training vs. required training, and the turnover (number of people lost and gained). The organization metric includes SW acquisition professionals in the Program Office as well as the desired knowledge base of the contractor(s), and should be supported by staffing plans, education programs, and training plans. The core metrics are relational across the acquirer and developer organizations. They are updated at each SETR with criteria that reflect the changing nature of SW acquisition across the lifecycle and they tie to PoPS metrics that are part of the 2 Pass/6 Gate process. Details on the approach to gathering and using the core metrics should be covered in the SW Measurement Plan.

Artifact Creator: Government or Developer depending on criteria

Applicable *at ITR*

1 *1120* Is staffing adequate (availability, skills, experience, certifications) to review capabilities in the ICD for potential software implementations, select alternatives for software, and conduct software planning activities?

Applicable *at ASR*

1 *1121* Is staffing adequate (availability, skills, experience, certifications) to assess software technical maturity and competitive prototyping efforts, address software considerations in developing the CONOPS and CDD, and conduct related software planning activities in accord with the initial TDS and SEP?

1 *1122* Does a plan exist to investigate Program Office software manpower requirements (e.g. staff phasing, skills, certifications, training and experience)?

2 *1123* Are software staff participating in the effort to update initial capabilities thresholds/objectives, to include draft KPPs/KSAs?

Applicable *at SRR1*

1 *1126* Has the planned investigation of Program Office software manpower requirements (required at ASR) been conducted, documented, and approved?

1 *1124* Is staffing adequate (availability, skills, experience, certifications) to address software in the CDD approval and the initial SDS development efforts, and to conduct related software planning activities (e.g., ensuring that SDP criteria are addressed in the SDS and that software quality metrics required by the SDP will include tracking software performance against operational requirements)?

1 *1125* Are software staff participating in refinement of KPP/KSA threshold/objective values (and their traceability from CDD to SDS) and development of architectural descriptions/views?

Applicable *at SRR2*

1 *1129* Has the planned investigation of Program Office software manpower requirements (required at ASR) been updated, as needed, and approved?

1 *1127* Is staffing adequate (availability, skills, experience, certifications) to address software in the CDD approval and updated SDS development efforts, and to conduct related software planning activities (e.g., ensuring that projected SW components, together with other system elements specified in the SDS, will satisfy the CDD, and that software quality metrics required by the SDP have been updated, if necessary, for tracking software performance against operational requirements)?

1 *1128* Are software staff participating in refinement of KPP/KSA threshold/objective values (and their traceability from CDD to SDS) and development of architectural descriptions/views?

Applicable *at SFR*

1 *1130* Is staffing adequate (availability, skills, experience, training and certifications) to address software-related SDS requirements and to provide software-related requirements in the RFP (including SDP requirements)?

1 *1132* Is execution of Program Office staffing plan on or ahead of schedule?

1 *1131* Are software staff verifying the maturity of software consideration in KPP/KSA threshold/objective values and architectural descriptions/views?

Applicable *at SSR*

1 *1405* Is execution of Program Office staffing plan on or ahead of schedule?

1 *1406* Is staffing adequate (availability, skills, experience, training and certifications) to address Software Requirements Description (SRD) and to provide software-related requirements in the RFP (including SDP requirements)?

Applicable *at PDR1*

1 *1134* Does the RFP (via SDP criteria) (and SEP and LCSP as appropriate) address requirements for software organization, including:
•Manpower requirements (including staff phasing metrics, skills and certifications required, and training plans)?
•Training metrics (actual training vs. required by plan), and required experience?
•Turnover metrics?
•Sustainment phase software organizational requirements (note – if RFP for EMD and RFP for SSA work will be separate, at this review the sustainment phase software organizational requirements will only be in the SEP and LCSP)

2 *1133* Is execution of the Program Office staffing plan on or ahead of schedule (to include source selection)?

Applicable *at PDR2*

1 *1335* Has the software organization metrics process been documented in the SDP? Is the metrics process executing appropriately – collecting and assessing the metrics, comparing actuals vs. planned trend lines, and identifying and communicating risk, as follows:
•Predicted trend lines are established for: hours per sampling period, training completed, and key software personnel arrivals and departures?
•Software organization metrics definitions and actuals include starting points of activities and tasks?
•Software organization metrics are sensitive enough to highlight risk issues such as: lack of training, lack of skilled software staff, key software personnel are late to task, and/or experiencing high turnover rate

1 *1135* Are organization metrics baselines established, including software staff labor hours anticipated, needed or fulfilled training, and key software personnel turnover expectations (gains/losses)?

2 *1136* Have preliminary sustainment phase organizational structure metrics baselines been identified in the LCSP?

Applicable *at CDR*

1   *1339* Is the standard process to collect and assess organization metrics being used? Are organization trend lines (hours per sampling period training complete, and key software personnel arrivals and departures, comparing actuals vs. planned) being tracked, analyzed, and reported?

2   *1141* Are organization metrics within tolerance or has justification and waiver been approved?

3   *1142* Have requirements for the software sustainment organization (e.g., SSA) been detailed in the program Life Cycle Sustainment Plan (LCSP)?

Applicable *at IRR*

1   *1424* Are organization trend lines (hours per sampling period training complete, and key software personnel arrivals and departures, comparing actuals vs. planned) being tracked, analyzed, and reported? Are organization metrics within tolerance or has justification and waiver been approved?

3   *1430* Is the standard process to collect and assess organization metrics being used?

Applicable *at TRR*

1   *1342* Are organization trend lines (hours per sampling period training complete, and key software personnel arrivals and departures, comparing actuals vs. planned) being tracked, analyzed, and reported? Are organization metrics within tolerance or has justification and waiver been approved?

2   *1146* Has the program LCSP been updated, as needed, with respect to requirements for the software sustainment organization (e.g., SSA)?

3   *1143* Is the standard process to collect and assess organization metrics being used?

Applicable *at SVR*

1   *1345* Are organization trend lines (hours per sampling period training complete, and key software personnel arrivals and departures, comparing actuals vs. planned) being tracked, analyzed, and reported? Are organization metrics within tolerance or has justification and waiver been approved?

2   *1150* Has the program LCSP been updated, as needed, with respect to requirements for the software sustainment organization (e.g., SSA)?

3   *1147* Is the standard process to collect and assess organization metrics being used?

Applicable *at PRR*

1   *1154* Has the program LCSP been updated, as needed, with respect to requirements for the software sustainment organization (e.g., SSA)?

3   *1151* Is the standard process to collect and assess organization metrics being used?

3   *1347* Are organization trend lines (hours per sampling period training complete, and key software personnel arrivals and departures, comparing actuals vs. planned) being tracked, analyzed, and reported? Are organization metrics within tolerance or has justification and waiver been approved?

3   *1348* Are size trending and actuals vs. planned size being tracked, analyzed, and reported? Are size variations within tolerance or has a justification and waiver been approved?

Applicable *at PCA*

1 *1158* Has the program LCSP been updated, as needed, with respect to requirements for the software sustainment organization (e.g., SSA)?

3 *1155* Is the standard process to collect and assess organization metrics being used?

3 *1349* Are organization trend lines (hours per sampling period training complete, and key software personnel arrivals and departures, comparing actuals vs. planned) being tracked, analyzed, and reported? Are organization metrics within tolerance or has justification and waiver been approved?

3 *1350* Are size trending and actuals vs. planned size being tracked, analyzed, and reported? Are size variations within tolerance or has a justification and waiver been approved?

SETR Criteria - Core Software Metrics
Enclosure (7) of Supplement to the Guidebook for Acquisition of
Naval Software Intensive Systems
(v 1.0 September 2010)

Maturity		*Core Software Metric - Software Quality*
Score	**ID**	**Criteria Statements**

Artifact Description   Navy policy requires all programs of record with any software (SW) to define, develop, and implement a minimum set of core metrics specific to their program, which includes SW quality. Early lifecycle considerations of SW quality should address expectations for Information Exchange Requirements (IERs) and SW data exchange (SDX) requirements. Later in the lifecycle, quality metrics should focus on the processes for SW defect identification, assessment, prioritization, and removal, including defect "density" (e.g., defects per unit design, SW module, or interface) and trends (e.g., actual vs. expected numbers of SW defects and rate of defect removal). The core metrics are relational across the acquirer and developer organizations. They are updated at each SETR with criteria that reflect the changing nature of SW acquisition across the lifecycle and they tie to PoPS metrics that are part of the 2 Pass/6 Gate process. Details on the approach to gathering and using the core metrics should be covered in the SW Measurement Plan.

Artifact Creator: Government or Developer depending on criteria

Applicable *at ITR*

3   *1213* Is a requirement to identify Information Exchange Requirements (IERs) and data exchange requirements addressed in AoA planning?

Applicable *at ASR*

2   *1214* Does a plan exist to investigate software engineering tools, techniques and processes?

3   *1323* Has a requirement to identify Information Exchange Requirements (IERs) and data exchange requirements been addressed in AoA planning, and in developing the CONOPS and CDD?

Applicable *at SRR1*

2   *1217* Has the planned investigation of Program Office software engineering tools, techniques, and processes (required at ASR) been conducted and approved?

3   *1218* Has a requirement to identify Information Exchange Requirements (IERs) and data exchange requirements been addressed in developing the CONOPS and CDD?

Applicable *at SRR2*

2   *1219* Has the planned investigation of Program Office software engineering tools, techniques, and processes (required at ASR) been updated, as needed?

3   *1220* Has the requirement to identify Information Exchange Requirements (IERs) and data exchange requirements been updated (if applicable) in developing the CONOPS and CDD?

Applicable *at SFR*

2   *1221* Are the approved Program Office software engineering tools, techniques and processes (see SRR criteria) in place and included in the updated SEP and SDS (as appropriate)?

2   *1222* Were software issues and SDP requirements included in validating traceability of the SDS back to the CDD?

3   *1223* Have initial estimates for expected numbers of software defects and preferred methods for their identification and removal been identified, including approaches for defect assessment against operational requirements and defect priority assignments?

Applicable *at SSR*

3   *1410* Have estimates for expected numbers of software defects and preferred methods for their identification and removal been updated, including approaches for defect assessment against operational requirements and defect priority assignments?

Applicable *at PDR1*

1   *1331* Does the RFP (via SDP criteria) (and SEP and LCSP as appropriate) include required metrics for software quality, including defect "density" and trends (e.g., defects per requirement, per unit design, per Source Lines of Code (SLOC), per unit, per interface)? Does it include defect identification, assessment, prioritization, and removal methods?

1   *1224* Does the RFP (and SEP and LCSP as appropriate) address requirements for developer software engineering tools and for inclusion of software in transferring the CM of product attributes (and the technical baseline) to the Government?

Applicable *at PDR2*

1   *1336* Has a process to collect and assess quality metrics been documented in the SDP (to include tracking software performance against operational requirements)? Is the process being used?

1   *1228* Have software quality baselines been identified and agreed between acquirer and developer/integrator?

2   *1231* Has a process for defect identification, assessment, prioritization, and remediation been developed (and if appropriate, does it account for builds at differing maturities with potentially different classes of defects)?

3   *1227* Have acceptable software quality definitions (e.g., defect, class of defects) and boundaries (including defect "density" (e.g., defects per requirement, per unit design, per SLOC, per unit, per interface)) been established and agreed to between acquirer and developer/integrator?

Applicable *at CDR*

1   *1232* Is the standard process to collect and assess quality metrics and quality variances being used?

2   *1233* Are quality metrics within tolerance or has justification and waiver been approved?

3   *1235* Has a sustainment process for defect remediation, tracking and analysis of software/system trouble reports and repair/maintenance been detailed in the program Life Cycle Sustainment Plan (LCSP)?

3   *1234* Is process for defect remediation being used and have defects have been eliminated to within acceptable limits?

Applicable *at IRR*

1   *1422* Are quality metrics within tolerance or has justification and waiver been approved?

3   *1431* Is the standard process to collect and assess quality metrics and quality variances being used?

3   *1426* Is process for defect remediation being used and have defects have been eliminated to within acceptable limits?

Applicable *at TRR*

1   *1237* Are quality metrics within tolerance or has justification and waiver been approved?

2   *1239* Has the program LCSP been updated, as needed, with respect to the sustainment process for defect remediation, tracking and analysis of software/system trouble reports and/or repair/maintenance?

3   *1238* Is process for defect remediation being used and have defects have been eliminated to within acceptable limits?

3   *1236* Is the standard process to collect and assess quality metrics and quality variances being used?

Applicable *at SVR*

1 *1241* Are quality metrics within tolerance or has justification and waiver been approved?

2 *1243* Has the program LCSP been updated, as needed, with respect to the sustainment process for defect remediation, tracking and analysis of software/system trouble reports and/or repair/maintenance?

3 *1240* Is the standard process to collect and assess quality metrics and quality variances being used?

3 *1242* Is process for defect remediation being used and have defects have been eliminated to within acceptable limits?

Applicable *at PRR*

1 *1247* Has the program LCSP been updated, as needed, with respect to the sustainment process for defect remediation, tracking and analysis of software/system trouble reports and/or repair/maintenance?

3 *1244* Is the standard process to collect and assess quality metrics and quality variances being used?

3 *1245* Are quality metrics within tolerance or has justification and waiver been approved?

3 *1246* Is process for defect remediation being used and have defects have been eliminated to within acceptable limits?

Applicable *at PCA*

1 *1251* Has the program LCSP been updated, as needed, with respect to the sustainment process for defect remediation, tracking and analysis of software/system trouble reports and/or repair/maintenance?

3 *1249* Are quality metrics within tolerance or has justification and waiver been approved?

3 *1250* Is process for defect remediation being used and have defects have been eliminated to within acceptable limits?

3 *1248* Is the standard process to collect and assess quality metrics and quality variances being used?

Maturity

Score   ID   Criteria Statements

Core Software Metric - Software Size/Stability

Artifact Description Navy policy requires all programs of record with any software (SW) to define, develop, and implement a minimum set of core metrics specific to their program, which includes SW size/stability. Software size is an aspect of the metric that must be baselined with initial measures, followed by continuing and consistent measures of size. Software stability is an aspect of the metric that compares subsequent measures of size to the baseline measures. Size/stability is a performance metric that covers both SW development (primarily new code) and SW integration (developed and/or reused/Commercial Off-The-Shelf (COTS) software). Acceptable Program Office alternatives for the size/stability metric include "equivalent" source lines of code (ESLOC) count, SW requirements count, and/or Function Points. The core metrics are relational across the acquirer and developer organizations. They are updated at each SETR with criteria that reflect the changing nature of SW acquisition across the lifecycle and they tie to PoPS metrics that are part of the 2 Pass/6 Gate process. Details on the approach to gathering and using the core metrics should be covered in the SW Measurement Plan.

Artifact Creator: Government or Developer depending on criteria

Applicable *at ITR*

3   *1322* Does the AoA Study guidance include relevant, adequately documented assumptions? Does it direct developing a projection of the percentage of total functionality provided by software for each alternative (to include considerations of improved energy efficiency in alternative system assessments)?

Applicable *at ASR*

3   *1076* Has a preliminary estimate and justification of the percentage of total system functionality to be provided by software for the preferred system alternative(s) been produced?

Applicable *at SRR1*

3   *1077* Has a refined estimate and justification of the percentage of total system functionality to be provided by software for the preferred alternative(s) been produced?

3   *1078* Has a preliminary identification (with supporting context information) of the percentage of total software that will be new development vs. Commercial Off The Shelf (COTS)/Government Off The Shelf (GOTS)/Non-Developmental Items (NDI)/open source been produced?

Applicable *at SRR2*

2   *1327* Has an updated identification (with supporting context information) of the percentage of total software that will be new development vs. Commercial Off The Shelf (COTS)/Government Off The Shelf (GOTS)/Non-Developmental Items (NDI)/open source been produced? Are the percentage estimates based on technology prototyping results, if any?

3   *1326* Has a refined estimate and justification of the percentage of total system functionality to be provided by software for the preferred alternative(s) been produced? Is the estimate related to/does it reflect the CONOPS and draft CDD that have been developed? Are the percentage estimates based on technology prototyping results, if any?

Applicable *at SFR*

2   *1329* Has a refined estimate and justification of the percentage of total system functionality to be provided by software been developed in association with the SDS? Is the estimate based on design prototyping results? Have software considerations including software architecture informed and been informed by requirements trades?

3   *1089* Have preliminary estimates and justification of the percentage of total software that are associated with software safety and software security been completed?

Applicable *at SSR*

1   *1332*   Has a preliminary software size baseline been identified by the Government, to include the following?
•Expected percentage of total system functionality to be provided by software?
•Percentage of total software that is expected to be new development and percent of total software effort that is expected to be interface development and integration work?
•Expected size of newly developed, reused, and modified software and size of interface/integration effort (Equivalent Source Lines of Code (ESLOC), Function Points (FP), and/or software requirements)?
•Software size growth expected during sustainment phase

2   *1330*   Has a refined estimate and justification of the percentage of total software that will be new development versus Commercial Off The Shelf (COTS)/Government Off The Shelf (GOTS)/Non-Developmental Items (NDI)/open source been developed in association with the SDS? Is the estimate based on design prototyping results?

3   *1408*   Have preliminary estimates and justification of the percentage of total software that are associated with software safety and software security been updated?

Applicable *at PDR1*

1   *1110*   Is there high-confidence in the software allocated baseline and underlying architecture?

1   *1333*   Does the Engineering & Manufacturing Development RFP (via SDP criteria) (and SEP and LCSP as appropriate) address required metrics for software size and stability, including source selection evaluation for the following:
•Percentage of total system functionality to be provided by software?
•Estimate and justification of the percentage of total software that will be new development or Commercial Off The Shelf (COTS)/Government Off The Shelf (GOTS)/Non-Developmental Items (NDI)/open source and percent of total software effort that is expected to be interface development and integration work?
•Software size estimates and justification, including size of interface/integration effort (to include software safety and software security)?
•Software baseline requirements, including expected growth and trend metrics for software stability, and the use of metrics for forecasting?
•Weighting factors for source selection

Applicable *at PDR2*

1   *1118*   Has a process to collect and assess size/stability metrics been documented in the SDP and is it being used?

1   *1337*   Has a size baseline (encompassing all software configuration items) been established using either Equivalent Source Lines of Code (ESLOC), Function Points (FP), or software requirements and stability? Have acceptable baseline variations over time been established?

2   *1117*   Have preliminary sustainment phase size/stability baselines been identified in the LCSP?

3   *1119*   Are any contract modifications traced to software size and stability?

Applicable *at CDR*

1   *1340*   Is a standard process to collect and assess size metrics being used? Are size trending and actuals vs. planned size being tracked, analyzed, and reported?

1   *1092*   Are size variations within tolerance or has a justification and waiver been approved?

3   *1093*   Have allowable size variations for software sustainment been detailed in the program Life Cycle Sustainment Plan (LCSP)?

Applicable *at IRR*

1   *1423*   Are size trending and actuals vs. planned size being tracked, analyzed, and reported? Are size variations within tolerance or has a justification and waiver been approved?

3   *1429*   Is a standard process to collect and assess size metrics being used?

Applicable *at TRR*

1 *1343* Are size trending and actuals vs. planned size being tracked, analyzed, and reported? Are size variations within tolerance or has a justification and waiver been approved?

2 *1097* Has the program LCSP been updated, as needed, with respect to allowable size variations for software sustainment?

3 *1094* Is a standard process to collect and assess size metrics being used?

Applicable *at SVR*

1 *1346* Are size trending and actuals vs. planned size being tracked, analyzed, and reported? Are size variations within tolerance or has a justification and waiver been approved?

2 *1101* Has the program LCSP been updated, as needed, with respect to allowable size variations for software sustainment?

3 *1098* Is a standard process to collect and assess size metrics being used?

Applicable *at PRR*

1 *1105* Has the program LCSP been updated, as needed, with respect to allowable size variations for software sustainment?

3 *1102* Is a standard process to collect and assess size metrics being used?

Applicable *at PCA*

1 *1109* Has the program LCSP been updated, as needed, with respect to allowable size variations for software sustainment?

3 *1106* Is a standard process to collect and assess size metrics being used?

Enclosure (8). SETR criteria for General Software Health Indicators

This enclosure provides SETR criteria statements for the General Software Health Indicators. See section 6 of this supplement for additional information.

SETR Criteria - General Software Health Indicators

Enclosure (8) of Supplement to the Guidebook for Acquisition of Naval Software Intensive Systems   (v 1.0 August 2010)

Maturity Score	*ID*	*Criteria Statements*

Artifact Description: Provides indicators of general software development health and software development risk. These criteria span across several artifacts and/or software core metrics, and were developed via a comprehensive review of all artifact-related criteria. These criteria will be most useful at the Technical Warrant Holder level.

Artifact Creator: Government

Applicable *at PDR1*

1   *1334* Does the RFP contain contract language required by ASN RDA Policy (ref. Memo of 17 Nov 2006, "Software Pr⌐ 13 Jul 2007, "SPII Guidance for Use of Software Process Improvement Contract Language")? Does the RFP inc software development data and the Integrated Development Environment (IDE), and other data rights, including ⅽ operational deliveries, as required?

Applicable *at IRR*

1   *1445* Have all planned software item tests been completed, executed, and analyzed? Were all test processes adhered deviation and risk incurred?

Applicable *at TRR*

1   *1387* Have all planned software item tests been completed, executed, and analyzed? Were all test processes adhered deviation and risk incurred?

Applicable *at SVR*

1   *1395* Is the software configuration specifically defined and under configuration control? Is the pedigree identified? Are cⅎ

1   *1392* Have all planned system tests been completed, executed, and analyzed? Were all test procedures adhered to? If and risk incurred?

1   *1391* Have all required system test reports been delivered and reviewed? Regarding all known test problems or troubl determined and has the expected result been documented for high priority problems?

Applicable *at PRR*

1   *1401* Does software configuration documentation completely define the content and state of each software item, with full capabilities and limitations?

1   *1399* Has the cumulative effect of all uncorrected software defects been assessed? Does the cumulative effect substant