DEPARTMENT OF THE NAVY
SPACE AND NAVAL WARFARE SYSTEMS COMMAND
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SPAWARINST 3084.1
SPAWAR 5.9
03 Dec 08

SPAWAR INSTRUCTION 3084.1

From: Commander, Space and Naval Warfare Systems Command

Subj: POLICY AND PROCEDURES FOR DEVELOPMENT AND EXECUTION OF TEAM SPAWAR SYSTEM OPERATIONAL VERIFICATION TEST (SOVT) DOCUMENTATION

Ref: (a) System Operational Verification Test (SOVT) Preparation and Execution Guide (SPEG) for Ship, Shore, and Submarine Installations, Version 1.2 of 03 Nov 2008
(b) SPAWARINST 4720.1

1. Purpose. Team SPAWAR is committed to fielding mature products that are designed, tested, and shown to comply with program/project requirements. To that end, continuous Systems Engineering (SE) process improvements are ongoing to include Test and Evaluation (T&E), which is an integral part of the SE process. As part of the overall improvements within the T&E continuum, the purpose of this instruction is to implement a new SOVT process.

2. Background. As part of a Team SPAWAR 4.0, 5.0, and PEO C4I collaborative effort, three conjoined Lean Six Sigma (LSS), Define, Measure, Analyze, Improve and Control projects and one Rapid Improvement Event were undertaken to improve the SOVT process.

a. The current undocumented SOVT process is producing:

(1) Inconsistent SOVT format, content, testing process, outcomes, and discrepancy management;

(2) Varying quality and adequacy of SOVT documentation and testing;

(3) Insufficient SOVT process metrics;

(4) Questionable first pass yield results due to SOVT discrepancies; and

(5) General fleet dissatisfaction with installation testing results and resolution of discrepancies.

b. A result of the LSS efforts was the creation of the SOVT SPEG, reference (a), the purpose of which is to establish guidance for:

(1) Development of standardized system SOVT documents;

(2) Development of platform specific SOVT documents;

(3) Approval of system and platform SOVT documents;

(4) Execution of approved platform SOVTs; and

(5) Tracking and resolution of SOVT discrepancies.

c. The expected benefits of compliance with this instruction and SPEG are:

(1) Consistent and standardized process across Team SPAWAR for development, approval, and execution of SOVTs;

(2) Added rigor and accountability through required review and approval process for SOVT documentation;

(3) Improved SOVT testing consistency and rigor; and

(4) Improved visibility into Team SPAWAR SOVT outcomes and feedback into the SOVT policy and process.

3. Scope. This instruction applies to all Team SPAWAR, including Space and Naval Warfare Systems Command, SPAWAR associated PEOs and program offices, and SPAWAR System Centers. For National Security Space Systems, this instruction will be applied to the maximum extent practicable. In the event that a non Team SPAWAR activity or contractor is tasked by a Team SPAWAR activity to develop solutions or services that require a SOVT (e.g. PEO EIS tasks NAVAIR as their developer and installation activity for an ERP effort), the SPEG shall be used in any Memorandum of Agreement, task statement, or contract language as a requirement for said developer. This instruction and reference (a) are in full compliance with the Navy's installation processes as implemented by reference (b).

4. Action

a. SPAWAR 5.9 acting as the designated SPAWAR Technical Authority for T&E, under the direction of the SPAWAR 5.0 Chief Engineer, shall establish and administer the SOVT process as defined by this instruction.

b. SPAWAR 4.2 installation competency shall ensure approved and certified SOVT documents are executed, and discrepancies tracked to resolution in accordance with reference (a).

c. Effective immediately, all Team SPAWAR activities that procure and/or develop systems/equipment intended to be installed on Navy platforms (ashore or afloat) and their Program/Project Managers, T&E competency Subject Matter Experts, SOVT developers, In-Service Engineering Agents, Installation Activities, and SOVT Execution Activities or agents shall utilize the SPEG processes for all future SOVT development, approval, planning, execution, and post-execution discrepancy tracking.

d. Grandfathering: SOVTs already developed for execution within six months of this instruction do not need to re-do their SOVT in accordance with SPEG. However, any SOVT that is currently under development or is planned for development and will be used for a Navy Platform C4ISR, SS, EIS, or Other Command Funded installation further than six months out from the date of this instruction must follow the SPEG.

e. SPAWAR 4.0/5.0 are the assigned Team SPAWAR leads to maintain, coordinate, distribute, execute, and assess compliance with the SPEG.

f. This policy and reference (a) shall be shall be jointly maintained by SPAWAR 4.2 and 5.9.

RADM | JSN

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System Operational Verification Test (SOVT)

Preparation and Execution Guide (SPEG) for Ship, Shore, and Submarine Installations

Version 1.2

Space and Naval Warfare Systems Command
Command, Control, Communications, Computers and Intelligence
Program Executive Office

03 Nov 2008

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Record of Changes

Version	Date	Changed by	Description of Change
1.1	09 Oct 2007	SOVT LSS Team Review	Update to figure 4-1 and section 4
1.2	03 Nov 2008	SOVT LSS Team Review	Update to Distribution Statement, update to Figures 4-2 and 6-2, update to paragraph 4.8

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1. Introduction

This document is the result of a Lean Six Sigma study undertaken to improve the Team SPAWAR System Operational Verification Test (SOVT) process. The expected benefits of using this document are the following:

- Reduction in installation planning and design time and consequent reduction in planning and design cost
- Improved readiness for operational units through improved testing
- Reduced operational risk
- Improved customer relations
- Better SOVT documentation
- Better understanding of roles and responsibilities
- Fewer SOVT discrepancies and improved tracking and resolution.

1.1. Scope and Applicability

The purpose of this document is to provide detailed guidance for the development of Team SPAWAR standardized system SOVTs, development of platform SOVT, approval of SOVT documents, execution of approved SOVTs, and finally for tracking and resolving SOVT discrepancies.

Even for a one-of-a-kind install, the requirements identified in the SPEG shall be followed. For a one-of-a-kind install, the system and the platform SOVT may be one and the same document.

1.1.1. SOVT Definition (Boundaries)

SOVT is defined as:

- A test or battery of tests that verifies that the installed or modified equipment, systems, interfaces with existing systems, and systems impacted by the installation are properly installed and operates as intended at the platform specific location and environment.

The SOVT document is defined as:

- A version-controlled and approved test plan that provides procedures for performing defined system parameter checkout as a result of a system installation or upgrade.
- The document that provides procedures with pass/fail criteria as applicable to verify and validate safety, security, environmental conditions, signal connectivity, configuration (i.e., strapping, ECs, etc.), internal and external system interfaces, system integration, offline/online system functionality, all required operational modes, any impacted equipment/systems functionality, and as-designed operating requirements. When required to verify external system interfaces or functions that can only be tested with another platform, the SOVT document contains procedures to test the operational interface and functionality with other platforms.

- The document that provides procedures and tables for recording test results, conducting a final equipment inventory, and documenting the system baseline results at the end of testing.

The signed SOVT document is defined as:

- A completed or executed SOVT plan that has been witnessed and signed, with all test results and any discrepancies recorded.

1.2. Purpose

The purpose of the SOVT process and documentation is to verify, validate, and demonstrate that the newly installed equipment, system, or systems and all other affected systems are operating as intended.

2. Applicable Documents

The following specifications, standards, handbooks, and instructions form a part of this document to the extent specified herein. Unless otherwise specified, the issues of military specifications and standards are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

2.1. Afloat and Shore Common Guidance Documents

The following specifications, standards and handbooks apply to both Afloat and Shore installation requirements. The standards listed are the latest available as of the date of this document. Users are responsible for ensuring that the standards they are using are current.

2.1.1. Government Specifications and Standards

Table 2–1 lists the applicable Government specifications and standards for Afloat and Shore installation.

Table 2–1. Government Specifications and Standards–Afloat and Shore

Document ID	Title
MIL-STD-188-114A(1)	Electrical Characteristics of Digital Interface Circuits
MIL-STD-1472F(1)	Design Criteria Standard, Human Engineering
MIL-HDBK-759C(2)	Human Engineering Design Guidelines
DODD 5230.24	Distribution Statements on Technical Documents

2.1.2. Commercial/Industry Specifications and Standards

Table 2–2 lists the applicable Commercial/Industry specifications and standards for Afloat and Shore installations.

Table 2–2. Commercial/Industry Specifications and Standards–Afloat and Shore

Document ID	Title
ASME Y14.38-1999 (with Y14.38A-2002 Addenda)	Abbreviations and Acronyms
H4/H8, Cataloging Handbook H4/H8	Commercial and Government Entity (CAGE)

2.2. Afloat Only Guidance Documents

The following specifications, standards and handbooks apply to Afloat installations only.

2.2.1. Government Specifications and Standards

Table 2–3 lists Government specifications and standards for Afloat installations.

Table 2–3. Government Specifications and Standards–Afloat Only

Document ID	Title
MIL-STD-1310G	Shipboard Bonding, Grounding and Other

Document ID	Title
	Techniques for Electromagnetic Comparability and Safety
MIL-STD-1399C	Interface Standard for Shipboard Systems
MIL-STD-1399-300A(1)	Interface Standard for Shipboard Systems Section 300, Electric Power, Alternating Current (Metric)
MIL-STD-1399-390	Interface Standard for Shipboard Systems Section 390, Electric Power, Direct Current, (Other than Ship's Battery) for Submarines (Metric)
MIL-STD-1399-502A	Interface Standard for Shipboard Systems Section 502, Electronic Systems Parameters
DOD-STD-1399-304(1)	Interface Standard for Shipboard Systems Section 304, Electrical Cables and Connectors
DOD-STD-1399-441	Interface Standard for Shipboard Systems Section 441, Precise Time and Time Interval (PTTI)
MIL-HDBK-290(1)	Standard Electrical Symbol List
DOD-STD-2106 (NAVY)	Development of Shipboard Industrial Test Procedures

2.2.2. Commercial/Industry Specifications and Standards

Table 2–4 lists Commercial/Industry specifications and standards for Afloat installations.

Table 2–4. Commercial/Industry Specifications and Standards–Afloat Only

Document ID	Title
ANSI Y32.10-1967(R1999)	Graphic Symbols for Fluid Power Diagrams
IEEE-200-1975	Reference Designations for Electrical and Electronics Parts & Equipments
ASTM F 856	Standard Practice for Mechanical Symbols, Shipboard Heating Ventilation and Air Conditioning (HVAC)

2.2.3. Naval Sea Systems Command Documents

Table 2–5 lists applicable Naval Sea Systems Command (NAVSEA) documents.

Table 2–5. NAVSEA Documents–Afloat Only

Document ID	Title
S-0300-AT-GTP-0l0/ESL	Standard Electrical Symbol List.(MIL-HDBK-290)
SE000-00-EIM-110	Electronics Installation and Maintenance Book, Installation Standards (NIMB)
0967-LP-000-0130	Electronics Installation and Maintenance Book, Test Methods and Practices

Document ID	Title
S9407-AB-HDBK-010 REV 2	Handbook of Shipboard Electromagnetic Shielding Practices
NAVSEA Drawing No. 53711-803-5001049	Piping System Symbols and Abbreviations
NAVSEA TS 9090-310D	Alterations to Ships Accomplished by Alteration Installation Teams
S9AA0-AB-GOS-010-GSO REV 4	General Specifications for Overhaul of Surface Ships

2.3. Shore Only Guidance Documents

The following specifications, standards and handbooks apply to Shore sites only.

2.3.1. Military Specifications and Standards

Table 2–6 lists Military specifications and standards for Shore installations.

Table 2–6. Military Specifications and Standards–Shore Only

Document ID	Title
MIL-STD-188-124B(3)	Grounding, Bonding and Shielding for Common Long Haul/Tactical Communication Systems Including Ground Based Communications-Electronics Facilities and Equipments
MIL-HDBK-411B(1), Vol 1-3	Power and the Environment for Sensitive DOD Electronics Equipment
MIL-HDBK-419A	Grounding, Bonding & Shielding for Electronic Equipments & Facilities, volume 1 & 2
MIL-HDBK-1004/7	Wire Communications and Signal Systems
MIL-HDBK-1012/1	Electronic Facilities Engineering
MIL-HDBK-1012/3	Telecommunications Premises Distribution, Planning, Design & Estimating
NAVSO P-5239-22	Protected Distribution System (PDS) Guidebook
OPNAV INST 5100.23G	Navy Safety and Occupational Health (SOH) Program Manual
OPNAV INST 5530.14D	Navy Physical Security and Law Enforcement
OPNAV INST 5090.1C	Environmental and Natural Resources Program Manual
UFC 3-520-01	Interior Electrical Systems
UFC 3-550-03N	Design, Power Distribution Systems
UFC 3-560-10N	Safety of Electrical Transmission & Distribution Systems

Document ID	Title
UFC 3-600-1	Fire Protection Engineering for Facilities
UFGS 16710	Building Telecommunications Cabling Systems
UFGS 26 2000	Interior Distribution Systems
EM385-1-1	U.S. Army Corps of Engineers Safety and Health Requirements
USDA RUS Bulletin 1753F-201(PC-4)	Standards for Acceptance Tests and Measurements of Telecommunications Plant
---	SPAWAR Shore Installation Process Handbook

2.3.2. Commercial/Industry Specifications and Standards

Table 2–7 lists Commercial/Industry specifications and standards for shore installations.

Table 2–7. Commercial/Industry Specifications and Standards–Shore Only

Document ID	Title
NFPA 70	National Electrical Code (NEC)
NFPA 780	Standard for the Installation of Lightning Protection Systems
ANSI/NECA/BICSI-568-2006	Standard for Installing Commercial Building Telecommunications Cabling
TIA-942	Telecommunications Standard for Data Centers
TIA/EIA-568-B.1	Commercial Building Telecommunications Cabling Standard, Part 1, General Requirements
ANSI/EIA/TIA-526-14A	Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant
ANSI/TIA/EIA-526-7	Optical Power Loss Measurements of Installed Singlemode Fiber Cable Plant
ANSI/TIA/EIA-455-59A	Measurement of Fiber Point Discontinuities Using an OTDR
ANSI/TIA/EIA-455-60A	Measurement of Fiber or Cable Length Using an OTDR
ANSI/TIA/EIA-455-61A	Measurement of Fiber or Cable Attenuation Using an OTDR

2.4. Order of Precedence

This SPEG is a process guide that directs steps to accomplish a SOVT. As a process guide, this SPEG takes precedence when developing and conducting a SOVT. However, the cited references take precedence with regard to technical standards to be employed in the conduct of the SOVT. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. Definitions

For the purpose of this document, the definitions listed in Table 3–1 apply.

Table 3–1. Definitions

Term	Definition
At-Sea Testing	A test or a series of tests performed on equipment or systems in a real time "At-Sea" scenario. Testing of this type may involve RF emissions that cannot be conducted in port or it may involve the verification of a specific system function that can only be tested in an underway ship-to-shore operational scenario.
C4ISR System	Any equipment or system that provides Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance services.
Characteristic	Any quality, property, capacity or attribute of equipment or a system that defines performance requirements.
Combat System	Any equipment or system that provides functions for the purpose of detecting, tracking, identifying, processing, evaluating, and controlling the engagement of hostile threats.
End-to-End Testing	End-to-End Testing, for the purposes of this document, is defined as the testing of an installed system or systems from user to user. It does not include the testing of systems unrelated or not impacted by the installation.
Equipment	A single unit of hardware or closely related group of hardware units that for testing purposes cannot be independently tested.
Function	Any intended operation of equipment or a system that defines performance requirements.
Grooming	Activities or actions taken to clean, align, adjust, and repair equipment or a system. Procedures for this work are not normally included in the SOVT document.
Inspection	An examination of the physical aspects of equipment or a system installation; e.g., physical appearance, materials used, and location conforms to approved design; work is complete and accurate; workmanship; pre-requisite conditions; etc.

Term	Definition
Integrated SOVT	For the purposes of this document, an integrated SOVT and consolidated SOVT are synonymous. They occur when multiple systems are installed together as one installation effort. The integrated or consolidated SOVT is designed to test each installed system and each affected system in a systematic and synchronized sequence based upon a functional dependency analysis. These comprehensive tests and analysis of more that one system installed in nearly a concurrently effort verifies all individual system functionality as well as the extended functionality of the entire suite of systems.
Interface	An electrical or mechanical connection between two or more equipment items or systems.
Inter-System Tests	Inter-system Tests are defined as testing between the installed or changed system and the other systems with which it interfaces. These tests shall include interface testing and the testing of any function requiring more than one system to perform.
Intra-System Tests	For the purposes of this document, Intra-system Tests are defined as those that are performed within a single system. It may include tests between equipment or groups of equipment within the same system to determine the functional status of that equipment or system including internal interfaces.
Key Performance Parameters (KPP)	Those characteristics or functions that define the critical performance requirements of equipment or a system.
Off-line Testing	A test or a series of tests that are conducted while the equipment/system is in a non-operational or “Off-line” state.
On-line Testing	On-line functional tests are normally limited to the testing of functions that cannot be tested “Off-line”. “On-line” tests may include the insertion and analysis of defined patterns, automatic error generators, or a pre-defined data sample into an operational “On-Line” system or equipment in order to verify that the system is operating as intended. “On-line” testing may also involve testing a specific operational scenario in order to validate that the system operates in that specific operational situation. “On-line” testing can also include a limited period during which normal operations are observed and results recorded.
Platform	Any ashore or afloat facility that contains C4ISR equipment.

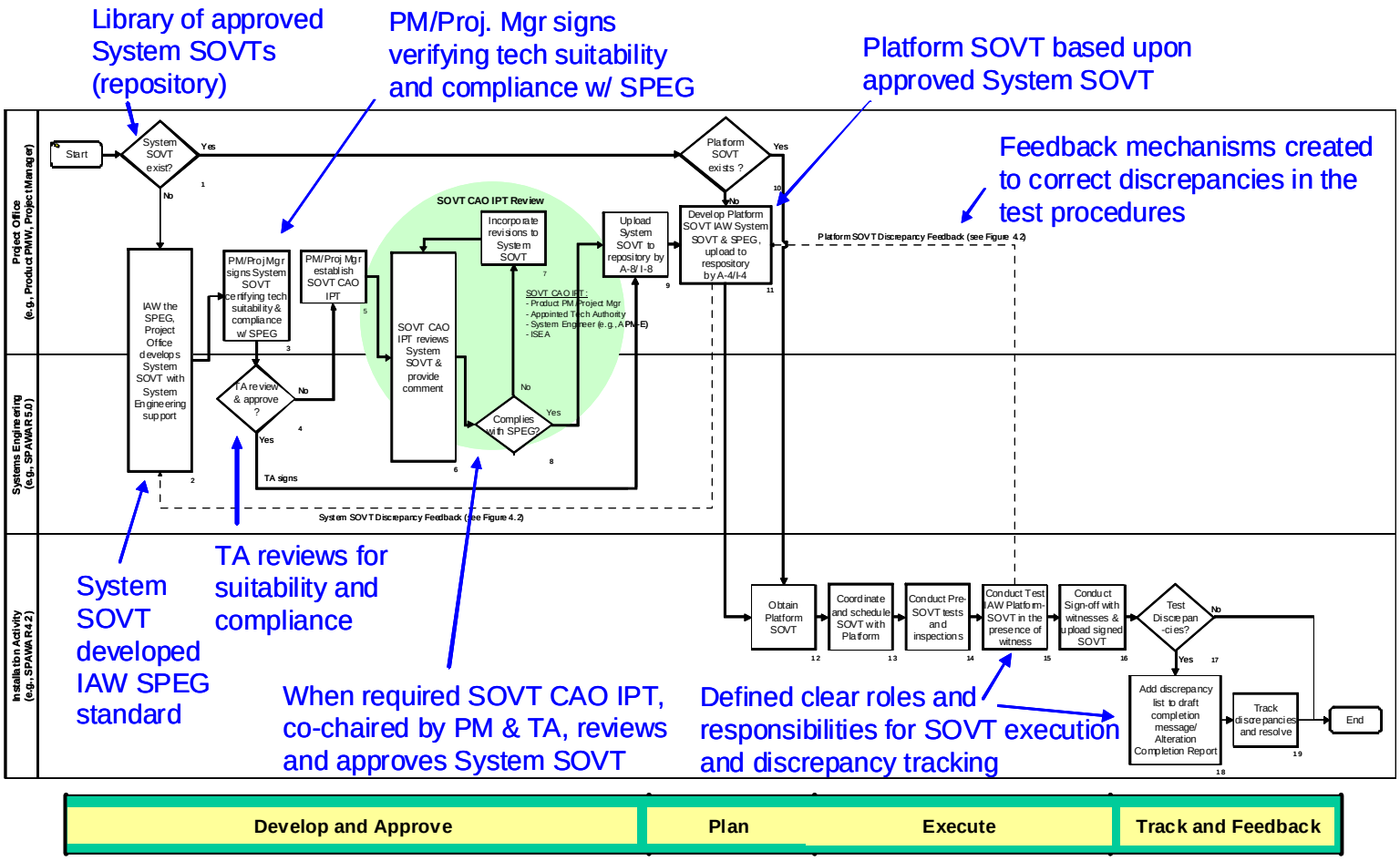
Term	Definition
Platform End-to-End Testing	A series of tests designed to groom and prepare a platform for deployment. These tests may include the entire installed C4I suite of systems on a platform or some subset or specific mission area such as communications. The Platform End-to-End Testing is not considered part of SOVT since it extends beyond the purpose of checking out the newly installed equipment or systems.
Pre-Installation Checkout (PICO)	This testing is conducted at the installation platform on the existing or already installed system and equipment. Sometimes referred to as “Baseline System Testing”, the purpose of these tests is to establish a functional baseline of the existing system before the installation begins. PICO differs from PITCO in that this testing is on the existing system vice the new equipment or system. PICO testing, if performed, precedes SOVT and is not considered part of SOVT.
Pre-Installation Test and Checkout (PITCO)	A test or series of tests that provides a level of confidence that the new equipment or system received from a vendor or assembled by the government that shall be delivered for installation is fully operational. PITCO testing, if performed, precedes on-site installation and is not considered part of SOVT.
Pre-Installation Tests	A type of testing that is conducted on new or existing equipment or systems that precede the on-site installation. PICO and PITCO are both examples of Pre-Installation Tests.
Pre-SOVT	Activities conducted prior to and during Stage 1 testing (e.g., configuration, design, and production verification actions; a dry-run SOVT without the customer's presence).
Software Application	Modular code designed to perform a set of specific functions.
System	A combination of two or more equipment items that operate in concert to accomplish the required set of performance requirements.
Test	For the purposes of this document, tests are a predetermined set of conditions, operations and measurements that are formally documented in test procedures and recorded results that when correctly performed verify and validate the equipment and system installation and enable a quantitative assessment of installation operability and readiness to support mission objectives.

Term	Definition
Test Elements	Any equipment or system characteristic, function, or interface that may be verified or demonstrated through testing.
Test Procedures	A detailed step-by-step description of the operations to be performed during the conduct of a specific test. Test procedures provide information and forms to plan for, conduct the test, record the test results, and identify the test pass/fail requirements.
Test Staging	A building block approach, where each subsequent test stage builds upon known test results from previous test stages. For the purposes of this document, test stages are defined as follows: • Stage 1: Inspection and Validation • Stage 2: Cold Checks • Stage 3: Equipment Tests • Stage 4: Intra-system Tests • Stage 5: Inter-system Tests • Stage 6: Operational Tests • Stage 7: At-Sea and Other Special Tests
Validation	Tests the performance of a system within its intended operational environment with anticipated operators and users.
Verification	Confirms that the system meets the design-to or build-to specifications; for SOVTs, tests the installed system against its as-designed requirements.

4. SOVT Process

The SOVT development and execution process is shown in figure 4-1. The process consists of three major components: development of a system SOVT document; development of a platform SOVT document; and SOVT execution and closeout.

Figure 4-1. SOVT Process



4.1. Process Steps

The steps for developing and approving the system SOVT document are identified in section 4.1.1; the steps for developing and approving the platform SOVT document in section 4.1.2; and the steps for SOVT execution and closeout in section 4.1.3. Other required system turnover aspects of the installation such as logistics support materials, training, etc. are not part of SOVT, but are part of the turnover process and are recorded in an "Alteration/Installation Completion Report." All open installation discrepancies are also recorded in a draft completion message that the customer is asked to provide. Upon successful completion of the SOVT, the platform assumes all operations and maintenance responsibilities.

4.1.1. Development of System SOVT Document Process Steps

1. Determine if system SOVT exists (reference figure 4-1, step 1)
    1) **Description**: Review system/project/program records to determine if a system SOVT document exists
    2) **Inputs**: system/project/program test records and history files
    3) **Product (Output)**: system SOVT if test records exist. No output if records do not exist
    4) **Responsible**: Program/Project Office
        I. **SPEG Compliance Certification**: Certified by Developer
        II. **Completed**: When records search completed.

2. Develop, review, and certify system SOVT (reference figure 4-1, step 2-3)
    1) **Description**: Consult and follow sections 5 and 6 of SPEG to develop system SOVT. Use SOVT checklist in Appendix B to ensure SOVT document is complete. Sign certifying that the SOVT document is technically suitable and complies with the SPEG.
    2) **Inputs**: Current version of SPEG, any applicable system documentation and SOVT checklist
    3) **Product (Output)**: Program/Project Office signed system SOVT document
    4) **Responsible**: Program/Project Manager
        I. **Approval/Signature Authority**: Program/Project Manager
        II. **Completed**: After completion of sections 5 and 6 of SPEG and reviewed using SOVT checklist.

3. Technical Authority reviews the system SOVT (reference figure 4-1, step 4).
    1) **Description**: Tech Authority reviews SOVT for technical suitability and compliance with the SPEG, if not suitable or compliant SOVT is returned to Program/Project Manager. If approved go to process step 5 of this section (reference figure 4-1, step 9).
    2) **Inputs**: Program/Project Office signed system SOVT document
    3) **Product (Output)**: Approved/disapproved system SOVT
    4) **Responsible**: Tech Authority
    5) **Approval/Signature Authority**: Tech Authority
    6) **Completed**: After completion of review and approval/disapproval of the provided system SOVT.

4. Program/Project Office establish a SOVT Competency-Aligned Organization (CAO) Integrated Product Team (IPT) based on disapproval from Tech Authority for review and approval of system SOVT. Chair and Co-chair for the IPT are the Product PM or Project Manager and the Technical Authority representative. (reference figure 4-1, steps 5-8)

1) **Description**: Program/Project Office shall establish and convene SOVT CAO IPT for review and approval of system SOVT
2) **Inputs**: Program/Project Office signed system SOVT document
3) **Product (Output)**: approved system SOVT
4) **Responsible**: Program/Project Office
    I. **Approval/Signature Authority**: SOVT CAO IPT Chair and Co-chair
    II. **Completed**: Upon SOVT document approval

5. Upload system SOVT to repository (reference figure 4-1, step 9)

1) **Description**: The approved system SOVT shall be uploaded to a designated common repository for access and collaboration by individuals with authorized access
2) **Inputs**: Approved system SOVT document
3) **Product (Output)**: System SOVT loaded in repository
4) **Responsible:** Program/Project Office
    I. **Approval/Signature Authority**: Not applicable.
    II. **Completed**: SOVT is loaded in designated repository and accessible by individuals with authorized access.

4.1.2. Development of Platform SOVT Document Process Steps

1. Develop platform SOVT (reference figure 4-1, steps 10-11)

1) **Description**: A platform SOVT shall be developed from the system SOVT using Chapter 7 in SPEG as guideline. Use SOVT checklist in SPEG to verify completeness.
2) **Inputs**: Approved system SOVT and current version of SPEG
3) **Product (Output)**: Platform SOVT
4) **Responsible**: Project Office
    I. **SPEG Compliance Certification:** Certified by Developer
    II. **Approval/Signature Authority**: Program/Project Manager
    III. **Completed**: Platform SOVT completed IAW Chapter 7 of SPEG.

2. Upload platform SOVT to repository (reference figure 4-1, step 11)

1) **Description**: The approved platform SOVT document shall be uploaded to a centralized repository for access and collaboration by individuals with authorized access.
2) **Inputs**: Approved platform SOVT document
3) **Product (Output)**: Platform SOVT document loaded in repository
4) **Responsible:** Program Manager
    I. **Approval/Signature Authority**: Not applicable.
    II. **Completed**: SOVT is loaded in repository and accessible by individuals with authorized access.

4.1.3. SOVT Execution and Closeout Process Steps

1. Obtain platform SOVT (reference figure 4-1, step 12)

    1) **Description**: Installation activity shall obtain platform SOVT from repository.
    2) **Inputs**: Platform SOVT
    3) **Product (Output)**: Platform SOVT
    4) **Responsible**: Installation Activity
        I. **Approval/Signature Authority**: Not applicable.
        II. **Completed**: Platform SOVT obtained.

2. Coordinate and schedule SOVT with platform (reference figure 4-1, step 13)

    1) **Description**: Installation activity shall coordinate and schedule SOVT IAW platform SOVT requirement or constraints.
    2) **Inputs**: SOVT pre-brief.
    3) **Product (Output)**: Agreed to SOVT schedule
    4) **Responsible**: Installation Activity
        I. **Approval/Signature Authority**: Not applicable.
        II. **Completed**: Mutually agreeable schedule and understood SOVT responsibilities between Installation Activity and platform.

3. Conduct Pre-SOVT tests and inspections (reference figure 4-1, step 14)

    1) **Description**: Conduct Pre-SOVT tests IAW approved platform SOVT
    2) **Inputs**: Approved Platform SOVT and agreed upon schedule
    3) **Product (Output)**: Pre-SOVT test and inspection results
    4) **Responsible**: Installation Team or SOVT Team
        I. **Approval/Signature Authority**: Not applicable.
        II. **Completed**: When Pre-SOVT checks and inspections completed

4. Conduct test IAW platform SOVT (reference figure 4-1, step 15)

    1) **Description**: Conduct platform SOVT using the approved SOVT according to the agreed to schedule and requirements with the platform.
    2) **Inputs**: Approved platform SOVT and platform schedule
    3) **Product (Output)**: Completed SOVT
    4) **Responsible**: SOVT Team / Witnessed by platform
        I. **Approval/Signature Authority**: Not applicable.
        II. **Completed**: Platform SOVT completed.

5. Conduct SOVT sign off with witnesses and upload signed SOVT (reference figure 4-1, step 16)

    1) **Description**: Obtain signatures from authorized platform's representative and SOVT lead. Upload signed SOVT into repository
    2) **Inputs**: Completed SOVT
    3) **Product (Output)**: Signed SOVT
    4) **Responsible:** SOVT Team and platform

I. **Approval/Signature Authority**: SOVT Manager and Platform Witness
II. **Completed**: SOVT sign-off sheet and SOVT uploaded in repository.

6. Determine and assess any SOVT test discrepancies (reference figure 4-1, step 17)

1) **Description**: Review completed SOVT test data and determine what, if any, discrepancies exist
2) **Inputs**: SOVT test results
3) **Product (Output)**: Discrepancies input into discrepancy tracker.
4) **Responsible**: Installation Management Office (IMO)
   I. **Approval/Signature Authority**: Not applicable.
   II. **Completed**: When discrepancies are input into SPIDER discrepancy tracker

7. Add discrepancy list to draft completion message / Installation Completion Report (ICR) / Alteration Completion Report (ACR) (reference figure 4-1, step 18)

1) **Description**: Add all agreed to discrepancies to draft completion message / ACR
2) **Inputs**: Conditional signed off SOVT
3) **Product (Output)**: Draft completion message / ACR with discrepancies listed
4) **Responsible**: Alteration Installation Team (AIT) Manager or Project Engineer (PE)
   I. **Approval/Signature Authority**: Not applicable.
   II. **Completed**: Mutually agreed to draft message / ACR with discrepancies reviewed by platform and SOVT Lead

8. Track discrepancies and resolve (reference figure 4-1, step 19)

1) **Description**: All discrepancies in completion message / ACR shall be addressed, tracked and resolved to mutually agreed SOVT Lead and platform satisfaction
2) **Inputs**: List of discrepancies from completion message / ACR
3) **Product (Output)**: discrepancy list tracker with all completed actions annotated
4) **Responsible**: AIT Manager or PE
   I. **Approval/Signature Authority**: Not applicable.
   II. **Completed**: When all discrepancies closed in discrepancy tracker.

4.2. Roles and Responsibilities for SOVT Development Phase

The following roles and responsibilities apply to the SOVT development phase.

4.2.1. Program or Project Office

For centrally managed systems, the cognizant program office is responsible for the development of both the system level and platform SOVT documents and can delegate responsibility to the project. For Other Command Funded (OCF) projects, the cognizant project office has the same requirement/responsibility for development of the system and platform SOVT documents. The program or project office may elect to develop the system SOVT utilizing in-house support, contractor support, In-Service Engineering Agent (ISEA) support or any combination thereof. The program or project office shall involve those responsible for the systems engineering with system SOVT development. If there is a disapproval from the Tech Authority review of the system SOVT,

the program or project office is responsible for establishing the SOVT CAO IPT to review, resolve, and approve the system SOVT, uploading the approved document into the data repository, and developing the platform SOVT.

4.2.2. SOVT CAO IPT

The SOVT CAO IPT is comprised of representatives from the Program or Project office, Systems Engineering/Technical Authority, including the Test and Evaluation (T&E) competency, and ISEA. The Program or Project Manager and the Systems Engineering/Technical Authority representative shall serve as Chair and Co-chair of the team. The IPT shall review system SOVTs, provide review comments, and reach consensus to approve and certify that the SOVT document is technically suitable and in compliance with the SPEG.

4.3. Roles and Responsibilities for SOVT Execution Phase

Roles and responsibilities for the SOVT Execution and Closeout Phase are provided below.

4.3.1. Installation Activity Installation Management Office (IMO)

In accordance with SPAWARINST 4720.1, the planning and execution of all installations shall be centralized in the established SPAWARSYSCEN Atlantic and SPAWARSYSCEN Pacific Installation Management Offices (IMOs). The IMOs shall act as a single POC and portal for all installations that are planned and executed by SPAWAR employees or SPAWAR contractors. For afloat installations, a Ship Superintendent (SHIPSUP) is assigned to coordinate all installation efforts on board the ship. The Regional Shore Installation Manager (RSIM) is responsible for coordinating all shore installations within their specific region.

4.3.2. AIT Manager/OSIC/NTR or Shore PE/OSGR

Upon receipt of tasking the IMO shall designate an AIT manager (a.k.a. On-Site Installation Coordinator (OSIC), Navy Technical Representative (NTR)) for ship and submarine installations or a PE (a.k.a. On-Site Government Representative (OSGR)) for shore installations. The AIT manager or PE is responsible for coordinating the entire installation effort. The AIT manager shall interface with the IMO, SHIPSUP, Alteration Installation Team, SOVT manager, Regional Maintenance and Modernization Coordination Office (RMMCO), ship's force, etc. Part of the AIT manager's responsibilities is to provide an installation in-brief to the ship. In-brief shall include general SOVT requirements in accordance with NAVSEA Tech Spec 9090-310D. Likewise, PEs shall interface with the IMO, RSIM, Installation Team, the SOVT Manager, station forces, etc. In-briefs shall include general SOVT requirements and schedule in accordance with the SPAWAR Shore Installation Process Handbook (SIPH).

4.3.3. Installation Team

The installation team that is responsible for conducting the installation. As part of the installation effort, the installation team is responsible for the quality, workmanship, and accuracy of the installation. The installation team conducts "Cold Checks" to ensure all cable connections and grounds are complete using the correct cable, are in accordance with the design, and to verify continuity of wiring through all cables and connectors throughout the system installation.
The installation team also inspects and tests applicable physical interfaces, and stress relief and cable management systems. The installation team also verifies the correct voltage is present to safely turn

on the equipment in order to begin the SOVT. These checks should be accomplished by the installation team prior to start of SOVT.

4.3.4. SOVT Manager/SOVT Team

The government employee that is responsible for coordinating and executing the SOVT effort. Depending upon the complexity of the installation, the SOVT manager may assemble a SOVT team of ISEA representatives or Subject Matter Experts (SMEs) to conduct the SOVT. The SOVT Manager shall obtain a copy of the platform SOVT document from either the repository or the cognizant program office and provide it to the SOVT team. The SOVT Manager shall ensure that appropriate clearance information is sent to the ship or shore site.

4.4. Preparing for SOVT Execution

Close coordination shall be maintained between the AIT manager, SOVT manager and SHIPSUP for ship and submarine installations and between the Project Engineer (PE), SOVT Manager, and RSIM for shore installations, to facilitate an orderly transition from the installation phase to the SOVT phase. The SOVT manager and SHIPSUP or PE shall interface with the ship or shore station forces to determine best time frame to conduct the SOVT. The SOVT manager shall provide a SOVT pre-brief to the ship or site to discuss the following:

- SOVT Time Frame
- At Sea Test Requirements
- System Interface Requirements
- Ship's Force Personnel Requirements
- Crypto/Special Requirements
- Satellite Access Request Requirements

4.5. Executing the SOVT

The SOVT manager shall execute the SOVT in accordance with the approved platform SOVT document. The SOVT Manager shall keep the SHIPSUP or RSIM, and the AIT Manager or shore PE informed on progress and issues. If in the process of performing the SOVT the SOVT team discovers an unforeseen configuration change that requires changes to the SOVT procedures, the SOVT manager is authorized to make pen-and-ink changes. If the pen-and-ink change would necessitate the system SOVT being updated for future installations, the changes shall be reported back through the change control process as described in Section 4.9.

4.5.1. Recording, Monitoring, and Reporting

The SOVT manager shall ensure that all SOVT results are recorded (to include test discrepancies and any workarounds) and forwarded to the AIT Manager or Shore PE. The SHIPSUP or PE shall input the discrepancies into the IMO database for tracking/resolution. For afloat installations, SOVT results shall also be documented in the ACR.

4.5.2. Discrepancy Tracking and Resolution

The AIT Manager or shore PE as appropriate shall be responsible for tracking and resolving all SOVT discrepancies. Status shall be reported in the IMO database as well as SPAWAR and PEO Integrated Data Environment and Repository (SPIDER).

4.5.3. Sign Off

Completed SOVT shall be signed by a senior enlisted or higher, normally the Electronics Material Officer (EMO) or as designated by the Commanding Officer.

4.6. Defined Measure Points

SPAWAR conducted a Lean Six Sigma (LSS) workout session to measure and analyze the existing SOVT process. During this workshop, some proposed measure points were defined. These measures if adopted shall need to be performed by SPIDER and the SOVT repository. The proposed measures are:

- On-time delivery of system SOVT
- First Pass Yield of Technical Authority review
- (SOVT CAO IPT) Review lead time
- Percent on-time delivery of platform SOVT
- Percent SOVT signed by customer
- SOVT discrepancy resolution time
- Categorize and count discrepancies

4.7. Reporting Requirements

Preparation for, in-progress status of, and actual completion of SOVT execution is reported via installation Situation Reports (SITREPs) by the AIT Manager or PE. These SITREPs are required monthly beginning six months prior to the installation and weekly beginning one month prior to the installation until project is finished and a final closeout SITREP is provided. In addition, SOVT results and any open discrepancies are reported in the ICR/ACR and in the Completion Message. The AIT Manager or PE is responsible to ensure all discrepancies are also reported and tracked via SPIDER.

4.8. Repository or Applicable Tools Requirements

The Navy's digital data policy requires that each SYSCOM, PEO, and PMW maintain developed technical data in an Integrated Digital Data Environment or repository that encompasses the entire organization. The intent of the Navy's digital data policy is that technical data is visible, available, and usable when needed and where needed by those authorized to have access. A common Team SPAWAR repository shall be maintained for the storage and retrieval of copies of SOVT documentation. The original and subsequent revisions of the SOVT documents shall be maintained in Microsoft Word compatible file format to facilitate reusability. The signature page of SOVT documents shall be scanned and inserted into the Microsoft Word file as a picture. Only completed/signed SOVT documents shall be scanned/converted into Adobe Acrobat Portable Document Format (PDF) file format (See Sections 5.1.2 and 5.1.3).

4.9. Approval Requirements and Change Control Process

SOVT document approval is obtained from the combination of the Program/Project Office and Tech Authority signatures as depicted in Figure 4-1, as well as Appendix A. A formal statement of approval is contained in each SOVT document stating the process and authority by which the document was approved for use. If any user believes that changes should be made to an approved

system or platform SOVT document, the user shall submit a SOVT Change Request Form to the cognizant program or project office. The program or project office shall obtain a Change Request tracking number from the repository, determine if a change is warranted, and issue a Change Notice to facilitate a quick response to those using the approved document. A Change Notice sequential number shall be used to track all changes approved against an existing document version. The program or project office shall periodically incorporate all change notices into a revised SOVT document and obtain approval through the same process depicted in figure 4-1, SOVT Process. Best practice for revisions is to use MS Word track changes feature to identify what changes have been made. The SOVT Change Control Process is done through the established approval process and is depicted below in Figure 4-2 and a Change Request and Change Notice Form are provided in Tables 4-1 and 4-2 below.

Figure 4-2. SOVT Change Control Process

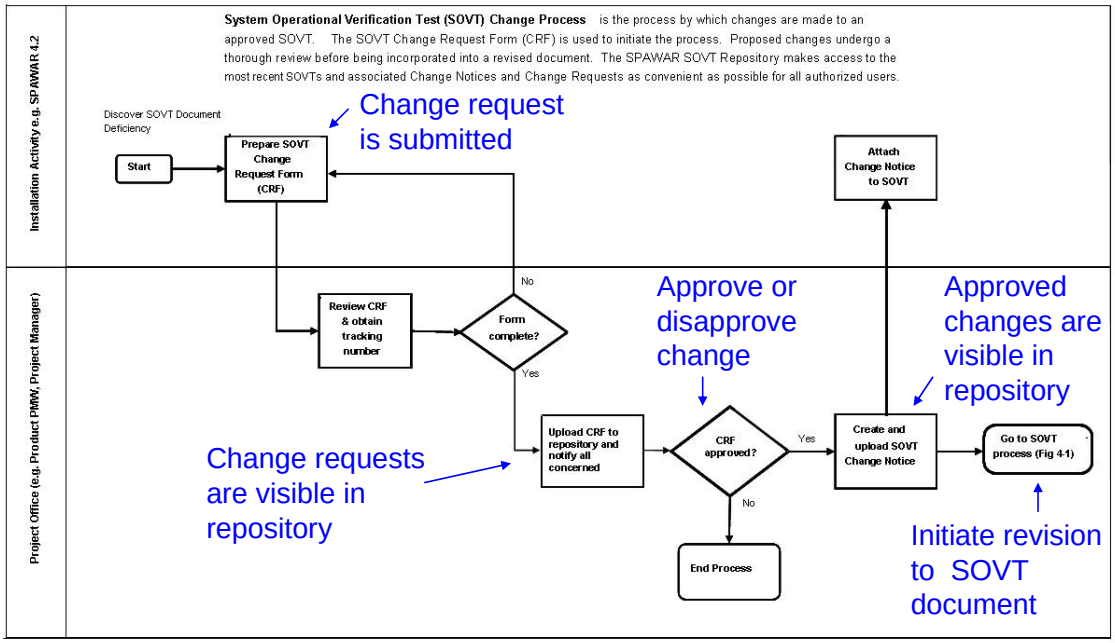


Table 4-1. SOVT Change Request Form

SPAWAR SOVT Change Request Form

The following portion is for CRF originator's use:

Last Name: :	UIC:
First Name:	Organizational Code:
E-mail address:	
Phone Number:	Cell Phone Number:
SOVT Document Number:	Revision Level:
SOVT Title:	
Description of Need for Change:	
Description of Proposed Solution:	
Attachment 1 Description:	
Attachment 2 Description:	
Attachment 3 Description:	
Statement of Urgency:	Deadline Date for Approval:
Enter Previous Tracking number of previous CRF if this is a resubmittal;	

The following portion is for the Program or Project Office representative's use:

Name:	E-mail Address:
Phone Number:	Cell Phone Number:
SOVT Change Request Tracking Number:	Date Reviewed (yyyy/mm/dd):
Remarks:	

Table 4-2. SOVT Change Notice Form

SPAWAR SOVT Change Notice Form

SOVT Document Title:	
Current Approved SOVT Document Number:	
Change Notice Number:	Date:
Questions concerning this Change Notice should be directed to:	
Name:	
Organization:	
E-mail Address:	
Desk Phone Number:	
This Change Notice addresses the following SOVT CRFs (Add rows as required.):	
Tracking Number:	Tracking Number:
Tracking Number:	Tracking Number:
Tracking Number:	Tracking Number:
This Change Notice shall require changes to be made to the following Sections:	
Cover Sheet ☐	Section 5. Intra-System Tests (Stage 4) ☐
Statement of Approval ☐	Section 6. Inter-System Tests (Stage 5) ☐
Record of Changes ☐	Section 7. Operational Tests (Stage 6) ☐
Table of Contents ☐	Section 8. At-Sea and Other Special Tests (Stage 7) ☐
Section 1. Introduction and Administration ☐	Appendix A. Configuration Audit Results ☐
Section 2. Inspection and Validation Tests (Stage 1) ☐	Appendix B. Record of Resolved and Unresolved SOVT Discrepancies ☐
Section 3. Cold Checks (Stage 2) ☐	Appendix C. SOVT Signature Page ☐
Section 4. Equipment Tests (Stage 3) ☐	
Brief description or summary of changes covered by this Change Notice:	

List of attachments (Add rows to form as required.):

Item	Description	No. of Sheets
1		
2		
3		
4		

Sheet 2

Detailed description of required change (Add continuation sheets as required.)	
Section:	Pages Affected:
Detailed Description:	

5. General Requirements

The following requirements apply to all SOVT documents prepared for Team SPAWAR regardless of system, platform, or tests that must be performed. The intent is to standardize SOVT document organization, style, and level of detail found in the test procedures. As was explained previously in Section 3, the SOVT test strategy to be utilized is a "staged" or building block approach.

5.1. Format Requirements

The following format requirements shall be used by developers of SOVTs for Team SPAWAR systems, equipment, and software. Program Offices shall provide System SOVT documents for each system and variant in the format specified below.

5.1.1. Standardized SOVT Document Structure

A standardized outline for the SOVT document is described below. Each section as described is mandatory to the extent that it is applicable to the system or platform under test.

- *Cover Sheet* – Each SOVT document shall include a cover sheet that provides key identification data about the document. As a minimum the cover sheet shall include a document title, a document number, a project identification number (platform SOVTs only), a distribution statement, and the date the document was approved. Document titles for system SOVTs that are intended to be used as a development standard for all platform SOVTS shall be in the form of "Standard System Operational Verification Test (SOVT) for 'System x', 'Variant y'". Document titles for platform SOVTs shall be in the form of "Platform System Operational Verification Test (SOVT) for 'systems and variants under test' at 'afloat command name' or 'shore command name'". Document identification numbers for system standard SOVTs shall be controlled centrally and issued by the SOVT repository. Document identification numbers for platform installation SOVTs shall be the system SOVT document number followed by a dash and the specific project identification number (i.e. job numbers for afloat and tracking numbers for shore) assigned by the SPAWAR and PEO Installation Data Environment and Repository (SPIDER). The system SOVT document is the 'parent' and platform SOVT documents are the 'children'. The SOVT document numbering scheme is intended to show this relationship and to facilitate traceability of each platform SOVT document to an approved system SOVT document. The distribution statement generally shall be C or D from DODD 5230.24(D). The date of the document is the day, month, and year that final approval was given by a designated authority in accordance with requirements defined in Section 4.
- *Approval Statement* – Immediately following the cover sheet, each approved SOVT shall include the developer's signature certifying compliance with the SPEG as well as a signed statement indicating by whose authority the SOVT document was approved for use.
- *Front Matter* – The document shall also include a record of changes, table of contents, and listings of any tables, figures, and appendices.
- *Section 1, "Introduction and Administration"* – This section shall introduce and summarize the SOVT document. As a minimum this section shall include the following information:

- Purpose of the SOVT document;
- Scope of the SOVT document;
- References;
- Points of contact;
- Applicable safety and security information;
- Summary description of systems under test;
- Functional block diagram(s) depicting the boundary of systems and interfaces under test; and
- Required test and support equipment and software.

- *Section 2, Inspection and Validation Tests (Stage 1)* – This section describes those aspects of the system or specific installation that should be inspected and validated. Stage 1 validates that all required equipment is on-hand and a configuration audit is completed as part of the inspection of the new equipment and systems. The results of the audit are recorded in Appendix A of the SOVT document. Therefore, Stage 1 documentation is normally in the form of inspection procedures. As a minimum the inspection should include the following:
  - Audit of hardware and software configuration;
  - Validation that all safety and security measures associated with this system or specific installation exist and no hazards are left unresolved, e.g. safety interlocks, raised floor hazards;
  - Observation of correct installation standards (e.g., TEMPEST, power, etc.);
  - Measurement of adequate clearance for personnel and equipment; and
  - Inspection of cable management to include stress relief and red/black separation.
- *Section 3, Cold Checks (Stage 2)* – This section provides procedures to ensure that the installation has been accomplished in accordance with approved installation plans and specifications. Some required tests are identified in Section 5.2, but in general "Cold Check" tests shall verify:
  - Cabinet power and ground connections;
  - Equipment power and ground connections; and
  - Signal cable connections.
- *Section 4, Equipment Tests (Stage 3)* – This section provides "off-line" testing procedures that determine if individual equipment performs within the expected performance parameters. Stage 3 tests are conducted in isolation from the integrated system.
- *Section 5, Intra-System Tests (Stage 4)* – This section provides procedures for testing within a single system. It shall likely include tests between equipment or groups of equipment within the same system to verify that the system is functioning correctly and that all internal system interfaces are working. Stage 4 tests verify to the extent possible that intra-system functions, signals and commands within the system are working while keeping the system in an "off-line" status.

- *Section 6, Inter-System Tests (Stage 5)* – This section provides procedures that test functionality and interfaces between the installed or changed system and the other systems with which it interfaces. Stage 5 tests verify to the extent possible that inter-system functions, signals and commands involving other interfaced systems are working while keeping the system in an "off-line" status.
- *Section 7, Operational Tests (Stage 6)* – This section provides procedures that cutover the newly installed or upgraded system to an "on-line" status and tests functions that could not be tested "off-line". This stage of tests may include the insertion and analysis of defined patterns, automatic error generators, or a pre-defined data sample into an operational "on-line" system or equipment in order to verify that the system is operating as intended. A specific operational scenario may also be tested in order to validate that the system operates in that specific operational situation. Stage 6 testing may also include a limited period during which normal operations are observed and results recorded. Stage 6 only includes testing that can be conducted pier side or without any at-sea testing.
- *Section 8, At-Sea and Other Special Tests (Stage 7)* – This section provides procedures that are specifically aimed at conducting a test or a series of tests in a real time "At-Sea" scenario. Stage 7 testing could involve RF emissions that cannot be conducted in port or it may involve the verification of a specific system function that can only be tested in a ship to shore operational scenario. At-Sea testing may also be concurrent with sea trials, acceptance trials, underway trials, or post repair trials. Stage 7 tests may also include other special test requirements with operational platforms such as deployed mobile systems.
- *Appendices* – The standardized SOVT document, as a minimum, shall include the following appendices:
  - Configuration Audit Results;
  - Record of Resolved and Unresolved SOVT Discrepancies; and
  - SOVT Signature Page.

5.1.2. Acceptable Formats for SOVT Documents

All SOVT documents shall be Microsoft Word compatible files designed to be printed on 8-1/2" by 11" paper. If necessary, the system functional block diagram that defines the test boundary may be a fold out, i.e. 11" by 17". To facilitate the automated generation of the Table of Contents, the title of each main section shall have the style *Heading 1* and the *Level 1* outline level applied to it in Microsoft Word. Each subsection of a main section shall have the style *Heading 2* and the *Level 2* outline level assigned to it. This pattern shall continue on down to at least three and to no more than six levels. There shall be page breaks separating the main sections from each other and section breaks separating the body from the remainder of the document. The body text shall be outline level *Body Text* in Microsoft Word. Body text shall use the *Times New Roman* font, and the font size shall be 12-point. Heading text font size shall be at least 12-point and no larger than 16-point. Text font size within tables shall be at least 10-point. Titles of appendices shall use the style *Heading 7* and have the *Level 7* outline level assigned to them. Each shall be preceded by a section break and all except the last shall be followed by one. These features shall be utilized to automate the generation of the List of Appendices. Captioning in Microsoft Word shall be used to automate the generation of lists of tables and list of figures that include page numbers.

5.1.3. Acceptable Data Formats for Test and Inspection Results

The standard acceptable format for the main body of the SOVT document is Microsoft Word. Test and inspection results that include handwritten information, photographs, test equipment printouts, and/or signatures shall be scanned/converted and included with the signed SOVT in Adobe Acrobat Portable Document Format (PDF).

5.1.4. File Size

The current SPAWAR document storage repositories do not have a limit on file size; however, to accommodate E-mailing of SOVT documents, they should be less than 10 megabytes. Adobe Acrobat Portable Document Format (PDF) files should be saved using the "Reduce File Size" command before emailing.

5.1.5. Wording of Text/Style

SOVT test procedures shall be in a language that is free of vague and ambiguous terms and that uses simple words and phrases to convey the intended meaning. The following guidance and practices shall be followed to the extent practical:

- Omit unnecessary theoretical information;
- Avoid language that requires specialized knowledge;
- Be specific and as concise as possible;
  - This: Observe indicator blinks;
  - Not this: Observe that the indicator blinks;
- Place numeric designators of nomenclature before descriptive information;
  - This: R-1738B/WR Radio Receiver;
  - Not this: Radio Receiver R-1738B;
- Define acronyms the first time that they are used;
- Use abbreviations defined by American Society of Mechanical Engineers (ASME) Y14.38; and
- Be consistent with language and phraseology.

5.2. Test Requirements for Various Installation Types

Care should be taken to ensure the content of the SOVT document is unclassified. If it is necessary to convey classified information to those executing the testing, a classified addendum can be created and managed separately in accordance with required procedures for safe guarding the classified information. With this approach, the main SOVT document remains unclassified and only the special addendum shall require classification and special handling.

5.2.1. Minimum Required Tests and Inspections

A scenario based approach is used in the SPEG to identify minimum test requirements. Table 5-1 defines "what" minimum test or inspection requirements are to be met by the SOVT document based upon the specified criteria or condition. The "how" of fulfilling the test requirements shall be found in Section 6. The test requirements portrayed in Table 5-1 and in Section 6 are not intended to be

procedures. Test procedures that satisfy each of the test requirements shall be prepared by the SOVT developer. The scenarios listed in these tables illustrate the wide variation of possible test scenarios that installations of different C4I systems might encounter. Table 5.1 is not all inclusive and there are many other test elements that specific C4I systems may need to include in the actual SOVT document for that system. Section 6.1 provides the method where by these additional test elements are to be identified and selected for inclusion in the SOVT document.

Table 5–1. Minimum Required Tests and Inspections

Installation Task Description	Required Test Elements	Reference/Remarks
Infrastructure; i.e. cabinets, cableways, cable management systems, mounting and grounding, ground systems, power systems, Intermediate Distribution Frames, etc.		
Installation of cabinets	Test 1.1	Table 6.1
Installation of electrical outlet	Test 2.1	Table 6.2
Mounting and grounding of equipment	Tests 1.4, and 2.4	Tables 6.1, and 6.2
New Connectivity		
Installation/activation of a new terrestrial circuit	Tests 1.11, 4.16, 5.9, and 6.10	Tables 6.1, 6.4, 6.5, and 6.6
In-Side Plant Cabling		
Installation of Cat 5/5e/6/6a/7 or similar copper cable Local Area Network (LAN) drops	Tests 1.3, 2.5, and 4.4	Tables 6.1, 6.2 and 6.4.
Installation of cables for an electronic device	Tests 1.3 and 2.6	Tables 6.1 and 6.2
Installation of Fiber Optic Cable	Tests 1.3 and 1.13	Table 6.1
Installation of Radio Frequency (RF) Cables	Tests 1.3, 2.7, and 6.5	Tables 6.1, 6.2, and 6.6
Out-Side Plant Cabling		
Installation of Copper Telecommunications Cable	Test 1.12	Table 6.1
Installation of Fiber Optic Cable	Test 1.13	Table 6.1
Installation of Underground Conduit Segments	Test 1.14	Table 6.1
Installation of Earth Electrode Ground System	Test 1.15	Table 6.1
Network Equipment/System		
Installation of Switches	Tests 1.2, 1.5, 2.2 or 2.3, 2.4, 3.2, 4.1, 5.1, and 6.1	Tables 6.1, 6.2, 6.3, 6.4, 6.5, and 6.6

Installation Task Description	Required Test Elements	Reference/Remarks
Installation of Routers	Tests 1.2, 1.5, 2.2 or 2.3, 2.4, 3.2, 4.1, 5.1, and 6.1	Tables 6.1, 6.2, 6.3, 6.4, 6.5, and 6.6
Installation of Wireless Routers	Tests 1.2, 1.5, 2.2 or 2.3, 2.4, 3.2, 4.1, 5.1, and 6.1	Tables 6.1, 6.2, 6.3, 6.4, 6.5, and 6.6
Installation of Hubs	Tests 1.2, 1.5, 2.2 or 2.3, 2.4, 3.2, 4.1, 5.1, and 6.1	Tables 6.1, 6.2, 6.3, 6.4, 6.5, and 6.6
Installation of network attached storage device	Tests 1.2, 1.6, 2.2 or 2.3, 2.4, 3.2, and 4.2	Tables 6.1, 6.2, 6.3, and 6.4
Installation of network encryption devices	Tests 1.2, 1.6, 2.2 or 2.3, 2.4, 3.2, 4.3, 5.2, and 6.1	Tables 6.1, 6.2, 6.3, 6.4, 6.5, and 6.6
Installation of ATM switches/routers	Tests 1.2, 1.7, 2.2 or 2.3, 2.4, 3.5, 4.5, 5.3, and 6.2	Tables 6.1, 6.2, 6.3, 6.4, 6.5, and 6.6
Information Assurance Equipment/System		
Installation of Firewall equipment	Tests 1.2, 1.4, 2.2, 2.4, 3.1, and 5.10	Tables 6.1, 6.2, 6.3, and 6.5
User Devices (Hardware only, i.e. Workstations, Printers, etc.)		
Installation of Servers	Tests 1.2, 1.4, 2.2 or 2.3, 2.4, 3.6, 4.9, 5.5, and 6.6	Tables 6.1, 6.2, 6.3, 6.4, 6.5, and 6.6
Installation of workstations/laptops	Tests 1.2, 1.4, 2.2 or 2.3, 2.4, and 4.10	Tables 6.1, 6.2, 6.3, and 6.4
Installation of Video Teleconference Center (VTC)	Tests 1.2, 1.4, 2.2 or 2.3, 2.4, 3.9, and 5.8	Tables 6.1, 6.2, 6.3, 6.4, and 6.5
Installation of UPS	Tests 1.2, 1.4, 2.2 or 2.3, 2.4, 3.10, and 4.14	Tables 6.1, 6.2, 6.3, and 6.4
Installation of Printers	Tests 1.2, 1.4, 2.2 or 2.3, 2.4, 3.11, and 4.15	Tables 6.1, 6.2, 6.3, and 6.4
RF and Baseband Equipment/System		
Installation of Radio Transceivers	Tests 1.2, 1.9, 2.2 or 2.3, 2.9, 3.6, 4.7, and 6.3	Tables 6.1, 6.2, 6.3, 6.4, and 6.6
Installation of Modems/Baseband	Tests 1.2, 1.16, 2.2 or 2.3, 2.4, 3.1, 4.8, and 6.4	Tables 6.1, 6.2, 6.3, 6.4, and 6.6
Installation of Antennas	Tests 1.2, 1.4, 1.8, 2.2 or 2.3, and 2.8	Tables 6.1, and 6.2
Navigation and Precise Time and Time Interval System/Equipment		
Installation of P/Y GPS Receivers	Tests 1.2, 1.4, 2.2 or 2.3, 2.4, 3.4, 4.6, and 5.4	Tables 6.1, 6.2, 6.3, 6.4, and 6.5

Installation Task Description	Required Test Elements	Reference/Remarks
Installation of Stratum One Clocks	Tests 1.2, 1.4, 2.2 or 2.3, 2.4, 3.3, and 5.4	Tables 6.1, 6.2, 6.3, and 6.5
Software installations, firmware, and mail outs		
Installation of software (includes new hardware with software pre-installed)	Tests 1.10, 3.11, 4.11, 5.6, and 6.7	Tables 6.1, 6.3, 6.4, 6.5, and 6.6
Installation of firmware	Tests 3.7, 4.13, and 6.9	Tables 6.3, 6.4, and 6.6
Mail out of software	Test 3.11, 4.12, 5.7, and 6.8	Tables 6.3, 6.4, 6.5, and 6.6

5.2.2. Factors Influencing Amount of Testing Required

The amount of testing required depends upon a variety of factors. These factors can include the following:

- Amount of proof of design testing conducted prior to installation;
- Differences or deficiencies between the lab test environment and the expected operational/combat environment;
- First time or unique unproven systems;
- Extensive lab testing of the prefabricated system;
- Historical data indicating possible equipment defects or early failure;
- Criticality (i.e., risk) of system to operations;
- Migration of operational or legacy data;
- Expected Operating Tempo (OPTEMPO) and duty cycle; and
- Remote location or platform availability for follow-on support.

5.2.3. Level of Writing Detail

The SOVT document shall be written at a level of detail that does not require extensive system knowledge or require the continuous look up of procedures in other publications that may or may not be available at the time of installation. The SOVT detail shall be appropriate for the least skilled participants including those individuals conducting the SOVT as well as the customer representative (the witness) that shall observe and verify the results.

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6. System SOVT Document Development

While the intent of SOVT is to not repeat system development, acceptance, and certification testing; there may be many tests and test procedures used during development that could also be used by the SOVT to prove out that the system operates as intended. To this end then, Program Managers should make testing procedures and results obtained during development testing available to those tasked with SOVT document development. Some examples of information that might be useful to those charged with SOVT development are:

- The configuration information used for lab testing – to include the different versions or configuration options that were tested;
- Test results/characteristics that were observed during Development Testing (DT) and Operational Testing (OT); and
- Copies of test procedures that were successfully executed during DT/OT.

Any new test procedures developed that have not been used previously during development should be dry-run in a lab to determine feasibility and validity.

6.1. Test Element Analysis, Selection, and Assignment

The functional block diagram included in Section 1 of the SOVT document shall be sufficiently detailed to identify all components and interfaces under test. Each block in the diagram shall represent an independent functional unit. External and internal interfaces shall be shown and the external equipment or systems that interface with the equipment or system shall also be shown. Figure 6-1 provides an example of a functional block diagram. (Use multiple pages as necessary.)

This functional block diagram is intended to depict the test boundary from which the test elements shall be identified. A test element can be any equipment or system characteristic, function, or interface that may be verified or demonstrated through testing. Test elements are selected by performing an analysis of the equipment, characteristics, functions, and interfaces that can and should be tested. Figure 6-1 provides an accurate depiction of the system in sufficient detail to support the analysis and test element selection process.

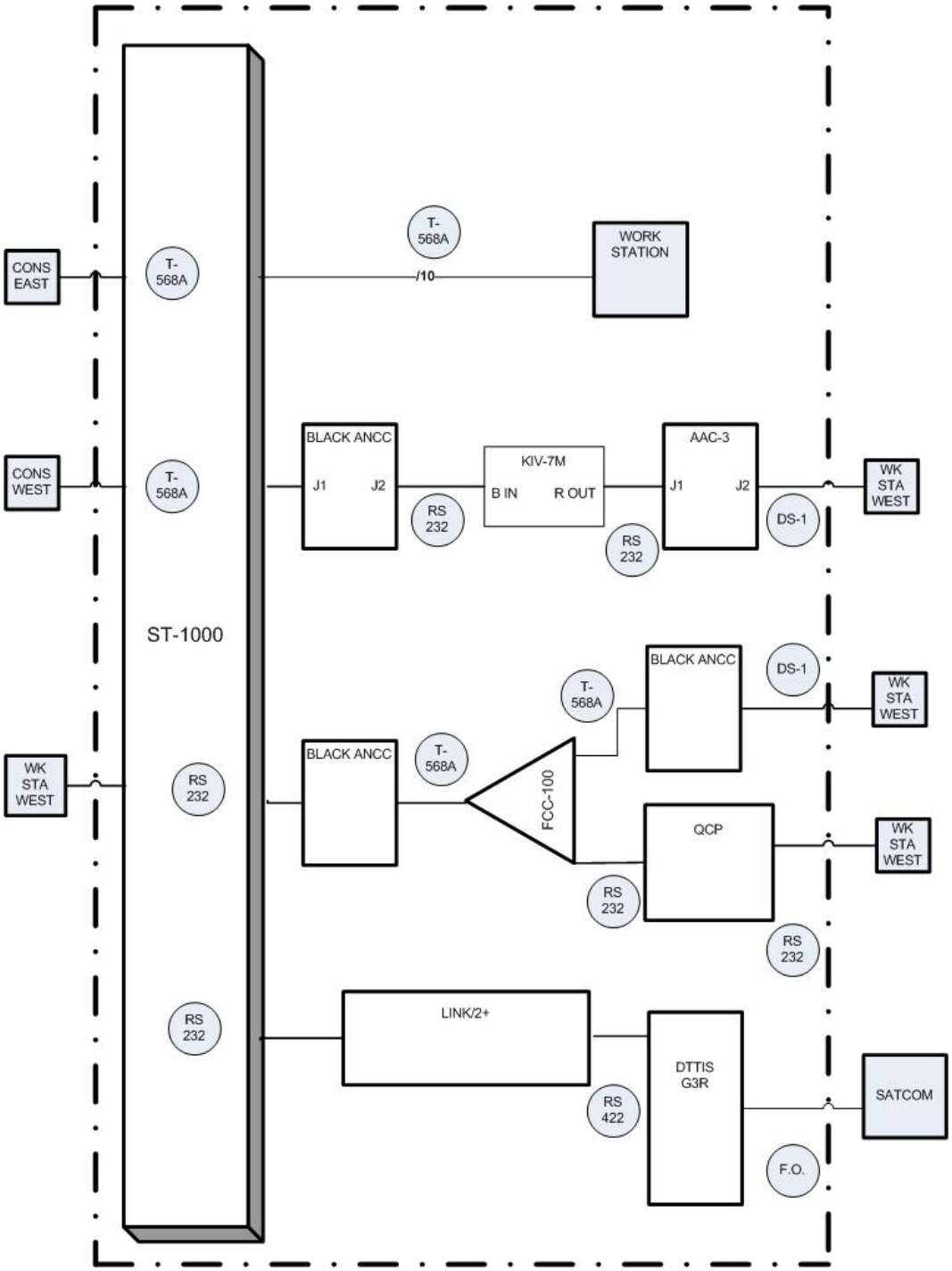

Figure 6–1. Test Boundary

6.1.1. Analysis of System Functional and Key Performance Characteristics

The functions of equipment or systems are those actions or operations that it is expected to perform. Characteristics are those qualities, specifications, capacity or attributes of equipment or the system that defines performance requirements. Some key characteristics determine how well the intended function shall perform.

Using the functional block diagram from Section 1, identify the discrete functions that each single unit of hardware, or closely related group of hardware units that for testing purposes cannot be independently tested, is expected to perform. Each block on the diagram should be examined to ensure that each action or service performed by the equipment under test is included in the list of functions. Any system function not previously identified through analysis of its component parts should also be listed. Each of these listed functions are test elements that may potentially be selected for testing.

For each block and the associated functions, determine if there are key characteristics. For each salient characteristic, ask the following questions:

- Does this characteristic determine how well the intended functions are performed?
- Does this characteristic distinguish between properly and improperly operating equipment or systems?
- Does this characteristic require adjustment or alignment to ensure proper equipment or system functionality?

A positive response to any of these questions indicates that the characteristic should be included in the list of test elements. Likewise, any system characteristic not previously identified through analysis of its component parts should also be subjected to these same questions.

6.1.2. Analysis of Interface Requirements

The next step in this process is to identify the interface test elements. Using the functional block diagram, review each interface. In some diagrams, a single line may actually be comprised of several signals or several identical connections between the equipment. The system under test could include interfaces that are electrical, including power and signal, optical, liquid, gas, or even mechanical. Internal interfaces are those that are within the defined test boundary and external interfaces are those that tie the equipment or system within the test boundary with other equipment or systems that reside outside the test boundary. Both the internal and the external interfaces are potential interface test elements. The following questions are intended to aid the test developer in determining what interfaces to include as test elements.

- Must this interface be tested in order to demonstrate satisfactory equipment or system performance?
- Does this interface require a checkout prior to equipment operation?
- Would testing of this interface provide information concerning a potentially unsafe or hazardous condition?

A positive response to any of these questions indicates that the interface under question should be included in the list of test elements.

6.1.3. Test Element Selection

The test elements that result from the analysis of system functions, characteristics, and interfaces form one consolidated list of potential tests. Each test element is considered for inclusion in the test outlines and test procedures.

The stated purpose of the SOVT process and documentation is for installing activities to verify, validate, and demonstrate that the newly installed equipment, system, or systems and all other affected systems are operating correctly. A pre-requisite condition or assumption is that compliance with system design specifications have already been tested and verified previously during DT/OT. If this pre-requisite condition is true, then all test elements may not need to be tested. Test element screening shall select those test elements that meet one or more of the following conditions:

- Test element is required to guarantee safe operation;
- Test element is essential to proving equipment and system performance and operation;
- Test element performance is essential to operation of other equipment or systems;
- Test element performance can be seriously degraded by shipping, installation, the actual operational environment, or by post installation adjustment; and
- Interface test element must be verified prior to operation of the equipment or system under test.

6.1.4. Assigning Test Elements to a Test Stage

Each test element shall need to be assigned to one or more stages of testing. Determining the right stage to conduct a test for a given test element is partly determined by the SPAWAR SOVT strategy. Given that the SPEG specifies a SOVT test strategy that is a “staged” or building block approach, where each subsequent test stage builds upon known test results from previous test stages, each test element should normally be assigned to the lowest stage possible to ensure that each subsequent test stage is not unnecessarily error prone. Defaulting to the lowest possible test stage shall need to be tempered by assessing whether a given test element can be indirectly tested at a later test stage. For example, it may be perfectly acceptable to indirectly test a given characteristic by demonstrating successful performance of a function at a later test stage. However, a test failure of that function would then likely result in falling back to tests that would have identified a problem at an earlier test stage. The SOVT developer shall need to exercise good judgment to determine when indirect testing at later test stage versus direct testing at an earlier test stage of a given test element is acceptable.

Normally, test elements that verify characteristics, functions or interfaces of single units of equipment or software that must be tested together as if an integrated whole shall be assigned to stage 3, equipment testing. Test elements that verify characteristics, functions, or interfaces that are within the test boundary are normally assigned to stage 4, intra-system testing. Test elements that require testing of external interfaces or functions that can only be tested with external systems are normally assigned to stages 5, 6 or 7. As test elements are selected and assigned to test stages, preparation of a Test Element Assignment Map as depicted in Figure 6.2 shall aid the SOVT developer in preparing the SOVT document outline.

Stage 1 Inspection	Stage 2 Cold Checks	Stage 3 Equipment	Stage 4 Intra-System	Stage 5 Inter-System	Stage 6 Operational	Stage 7 At-Sea
Test Element 1	Test Element 1	Test Element 1				
Test Element 2	Test Element 2	Test Element 2				
Test Element 3	Test Element 3	Test Element 3				
Test Element 4	Test Element 4		Test Element 4		Test Element 4	
Test Element 5				Test Element 5	Test Element 5	
						Test Element 6

Figure 6–2. Test Element Assignment Map

6.1.5. Developing the SOVT Document Outline and Test Procedures

The next step in this process is to create a SOVT document outline and prepare test procedures. This step begins with obtaining the MS Word SOVT template file depicted in Appendix A of the SPEG. From the Test Element Assignment Map, discussed in Section 6.1.4 and depicted in Figure 6-2, add the selected test elements to the outline for each applicable section of the SOVT, e.g. Sections 2 (stage 1) thru Section 8 (stage 7). Upon completion of the test outline, begin preparation of the detailed test procedures with pass/fail criteria required for each section of the SOVT.

Section 2 through Section 8 shall contain detailed testing steps that shall define the test procedures and what constitutes pass or fail. Each testing step must be sequenced properly to ensure that the test procedure can be correctly and efficiently performed. In many cases, previously used test procedures can be reused or modified to satisfy the current system testing requirement. Some potential sources for test procedures are factory test acceptance procedures, maintenance requirement cards, technical manuals, and the SOVT document repositories. The test procedures shall be written so as to not be dependent on other publications for test procedures. Consider the following additional factors:

- Feasibility of the planned test;
- Availability of required test equipment;
- Efficient use of test personnel;
- Minimizing the need for external support; and
- Minimizing operational impact and risk.

Appendix A of the SOVT document shall contain forms for recording the results of the configuration audit conducted during Stage 1 “Inspection/Validation”. Appendix B shall contain forms for recording all resolved and unresolved SOVT discrepancies. Appendix C shall contain the SOVT signature page.

6.2. Document Contents

6.2.1. Front Matter Requirements

System SOVTs shall follow the front matter general requirements as defined in Section 5.1. General format requirements as a minimum include a cover sheet, an approval statement, a record of changes, table of contents, and a list of any tables, figures, and appendices. Other optional front matter may be considered, but is not required. For example, additional front matter could include an executive summary, and/or a preface. Since Section 5.1 provides adequate guidance on SOVT front matter, it shall not be further expounded upon in Section 6.

6.2.2. Section 1: Introduction and Administration

Each SOVT document shall include introductory and administrative information as follows:

Section 1.1: Purpose. A brief purpose statement shall be included that states the purpose of the specific system SOVT document is to provide a battery of tests that can be used to verify, validate, and demonstrate that specific system or sub-system is operating correctly.

Section 1.2: Scope. The scope statement provides an abbreviated high level definition of what is being tested. It should be precise to include the system and/or sub-systems and the specific variant under test. If the system SOVT document is intended only for a specific platform, a given ship class, a type of shore platform, or a user customer base then that demarcation shall also be given.

Section 1.3: References. The references provided should have a direct correlation to the system under test and have some value either for understanding the system under test, for customizing a test procedure for a specific installation, or even for troubleshooting a failed test. For example, a standardized system SOVT document would reference key documents such as that system's Installation Requirements Drawings (IRDs), appropriate technical manuals, system configuration setup documents, etc.

Section 1.4: Points of Contact. Key points of contact that should be included in the system SOVT are; Assistant Program Manager (APM) or equivalent Project Manager, System Engineer/Architect or equivalent technical lead, ISEA representative, and the SOVT author. These are points of contact that the platform SOVT developer could potentially contact as the SOVT document is tailored to a specific installation. In addition, a place holder field for the Project Engineer, SOVT Manager, and Platform Representative should be included.

Section 1.5: Safety Measures. All known safety hazards associated with the inspections and testing need to be identified in this section and specific safety guidance given. If a specific hazard is known then the specific location and nature of the hazard needs to be identified. For example, if this section of the SOVT states "Never measure voltage potential in excess of 1000 volts by means of flexible test leads or probes", then this section should also identify the locations where the high voltage may be encountered. Another example is when RF radiation could possibly be encountered, the potential radiation sources must be identified and procedures given for de-energizing and tagging out to ensure the safety of the test personnel.

Section 1.6: Security Measures. This section shall address all security issues related to the system under test or resulting from the specific tests. Common security issues include required security clearance of personnel, handling and storage of classified equipment, classification of initially unclassified components after operational testing, specific

Communication Security (COMSEC)/Key Material (KEYMAT) requirements, and classification of supporting documentation. The intent of this section is to identify security risks and security requirements in order to safeguard our national interests.

Section 1.7: System Description. This section shall provide a description of the system under test as well as clearly define the test boundary. Included with this description is the required Functional Block Diagram depicting all hardware components and interfaces under test. Each block in the diagram shall represent an independent functional component. External and internal interfaces shall be shown and the external equipment or systems that interface with the equipment or system shall also be shown. See Figure 6-1 for an example of a Functional Block Diagram. The system description should describe the intended functionality of each component and interface depicted in the block diagram.

Section 1.8: Support Equipment and Software. This section shall list all required support and test hardware, software, and any other materials needed to successfully complete the testing described in the SOVT document. The organization and/or individual responsible for supplying each item shall be identified. For example, if Special Purpose Electronic Test Equipment (SPETE) is needed, the Program or Project Office is normally required to provide this equipment. General Purpose Electronic Test Equipment (GPETE) is normally provided by the station or ship forces. Any testing support equipment, software, or material to be provided by the installation activity or SOVT team should also be identified.

6.2.3. Section 2: Inspection and Validation Tests (Stage 1)

Section 2 of the SOVT document shall describe those aspects of the system or a given installation that should be inspected and validated. This section is to ensure that inspections were carried out and does not refer to doing the actual inspections. Stage 1 also validates that all required equipment is on-hand and completes an audit of the system hardware and software configuration as part of the inspection. The results of the audit are recorded in the SOVT document's Appendix A. Therefore, Stage 1 documentation is not normally in the form of test procedures, but rather takes the form of a checklist of specific requirements to inspect and validate. The inspection should validate the configuration of the hardware and software, the existence of safety or security measures, that correct installation standards were observed, that proper clearances are allowed for personnel and equipment, and that adequate cable management methods were employed to provide stress relief and to separate red and black cables. Table 6.1 defines additional minimum Stage 1 test requirements if the system under test includes any of these potential test elements.

Table 6–1. Minimum Stage 1 Requirements for Common Installation Tasks

Test Element	Installation Task Description	Required SOVT Item Description
1.1	Installation of new electronic cabinets	1) Inspect that each cabinet is securely mounted to the true floor. 2) Inspect that each is grounded in accordance with MIL-STD-188-124B for shore and MIL-STD-1310G for ships. 3) Inspect that each has a prominent label showing the originating power panel and breaker number. 4) Verify that shore cabinets have a minimum of 1 m of front clearance and .6 m of rear clearance in accordance with Telecommunications Industry Association (TIA) 942 and that there is at least 3 feet separation from any power panels with a nominal voltage to ground of 150 volts or less in accordance with National Electrical Code (NEC).
1.2	Installation of an electronic device requiring single phase outlet power	1) Verify that labels at circuit breaker panel, cabinet, and at outlet end identifies the correct power circuit. 2) For shore power, inspect outlet wiring to ensure ground (green) and neutral (white) wires are not reversed. 3) For ships power, inspect that proper pin connection was made. 4) Verify that proper wire gauge and circuit breaker capacity was used.
1.3	Installation of cables for an electronic device	1) Verify proper fit of connectors, conductors and backshells. 2) Verify that adequate cable support and strain relief is in place. 3) Check for proper cable labels installed in accordance with DOD-STD-1399-304 for ships and Shore Installation Process Handbook for shore. 4) Verify that each cable was tested for continuity, shorts, opens, and correct pin out by installation personnel.

Test Element	Installation Task Description	Required SOVT Item Description
1.4	Installation of electronic devices or antennas	1) Inspect bonding, grounding and shielding of equipment or antenna is in accordance with MIL-STD-188-124B for shore and MIL-STD-1310G for ships as appropriate. 2) Check for the presence of a "Field Change" Information label posted on the equipment if applicable. 3) If equipment is installed in electronic cabinets, verify that the equipment does not protrude more than 5 cm past the front of the cabinet with the exception of handles for sliding equipment and patch cord management hardware. 4) Verify that placement of physical items conforms to design drawings (with drawings corrected if needed), or have the SOVT state that drawings do not apply.
1.5	Installation of a network switch, router, wireless router, or hub	1) Conduct same inspection as for electronic devices. 2) Verify that the switch equipment passed a Pre-Installation Test and Check Out (PITCO) during acceptance/lab testing.
1.6	Installation of a network encryption device	1) Conduct same inspection as for electronic devices. 2) Validate that Cryptographic Ignition Key (CIK) is installed.
1.7	Installation of an Asynchronous Transfer Mode (ATM) switch/router	1) Conduct same inspection as for electronic devices. 2) Validate that correct components are installed. 3) If ATM was preconfigured, validate that equipment passed a Pre-Installation Test and Check Out (PITCO) during acceptance/lab testing.
1.8	Installation of a new antenna group	1) Conduct same inspection as for electronic devices. 2) Visually verify presence of "Weep Holes", new Gaskets and the use of "Ferrous – Non-Ferrous" materials as appropriate. 3) Ensure proper RF Hazard safety placards are prominently posted in the correct locations. 4) Ensure all "Deck Boxes" or external coupler enclosures that are exposed to the weather are water tight and if Dry Air is used the Dry Air pressure is adequate.

Test Element	Installation Task Description	Required SOVT Item Description
1.9	Installation of a new radio transceiver set	1) Conduct same inspection as for electronic devices. 2) Validate that equipment passed a Pre-Installation Test and Check Out during acceptance/lab testing. 3) Ensure RF safety placards and labels' are prominently posted in the correct locations.
1.10	Installation of new software	1) Validate that hardware configuration is correct. 2) Validate that software is approved, authorized to operate on this system, is certified (as applicable), and is licensed (as applicable).
1.11	Activation of a new terrestrial circuit	Verify that required tests per DISA Circular 310-70-1 were completed. Record test results in the format of DD Form 1697, "Circuit Parameter Test Data – Analog" or "Circuit Parameter Test Data – Digital". If tests were not completed, ensure tests are completed as part of Stage 4 or 5 testing. Failed tests should be recorded as a discrepancy and the circuit logged out to the vendor for resolution.
1.12	Installation of Out-Side Copper Telecommunications Cable Plant	Verify that testing was performed in accordance with RUS Bulletin 1753F-201(PC-4) Section 3 or equivalent.

Test Element	Installation Task Description	Required SOVT Item Description
1.13	Installation of Fiber Optic Cable	Verify that each segment and fiber of the installed fiber optic cable was tested for optical loss performance. Segments that fail to pass a optical loss performance test shall be tested using an Optical Time Domain Reflectometer and test traces recorded. RUS Bulletin 1753F-201(PC-4), RUS Standard for Acceptance Tests and Measurements of Telecommunications Plant can be used as the basis for developing fiber optic test requirements. TIA/EIA-568-B.1 Section 11.3.3.1 states that "The horizontal fiber cabling link segments need to be tested at only one wavelength." Section 11.3.3.2 states that "Multimode backbone links shall be tested at 850 nm and 1300 nm in accordance with ANSI/EIA/TIA-526-14A." Link attenuation testing should be done using an optical power meter (not an OTDR). TIA/EIA-568-B.1 states that "Singlemode backbone links should be tested at 1310 nm and 1550 nm in accordance with ANSI/TIA/EIA-526-7, Method A.1, One Reference Jumper.
1.14	Installation of new outside plant conduit segments	Verify that "Mandrel" testing was performed and successfully passed. Mandrel testing consists of pulling a cylindrical device, usually 5% smaller than the inside diameter of the conduit through each conduit segment. Blockage indicates incorrect installation. Wetting of the Mandrel indicates settlement of water due to incorrect sloping of the conduit.
1.15	Installation of Earth Ground System	Verify that newly installed ground rods and ground systems were tested using the fall of potential method as described in MIL-HDBK-419A. PPM INC R1L-C Full Scale Earth Resistance Tester, NSN 6625-01-377-6166, or equivalent supports this type of testing.
1.16	Installation of Modems/Baseband equipment	1) Conduct same inspection as for electronic devices. 2) Validate that the modem/baseband equipment passed a Pre-Installation Test and Check Out (PITCO) during acceptance/lab testing.

6.2.4. Section 3: Cold Checks (Stage 2)

Section 3 of the SOVT document shall contain test procedures that are often referred to as "Cold Checks". These are tests, which are typically conducted prior to applying power to the system. These tests verify that the power distribution system, the ground connections, and the cable connections are all functioning within allowed tolerances and specifications. Table 6.2 defines minimum Stage 2 test requirements if the system under test includes any of these potential test elements.

Table 6–2. Minimum Stage 2 Requirements for Common Installation Tasks

Test Element	Installation Task Description	Required SOVT Item Description
2.1	Installation of an electrical outlet	1) Determine voltage under no-load conditions. 2) Complete a voltage drop test (under load) at 12 amps for circuits with 15-amp breakers, 15 amps for circuits with 20-amp breakers, and at 20 amps for 30-amp breakers. Ideal Suretest 164 or a similar test set can make this test simple to conduct. 3) Complete a proper wiring test for 3-wire receptacles. Commercial receptacle testers are readily available that test for reverse polarity, open ground, open neutral, open hot, hot and ground reversed, hot on neutral, hot unwired, etc.
2.2	Installation of an electronic device requiring single phase outlet power (shore power)	Complete a proper wiring test for 3-wire receptacles. Commercial receptacle testers are readily available that test for reverse polarity, open ground, open neutral, open hot, hot and ground reversed, hot on neutral, hot unwired, etc.
2.3	Installation of an electronic devices using ships power	Complete a proper wiring test for 3-wire receptacles. Commercial receptacle testers are readily available that test for reverse polarity, open ground, open neutral, open hot, hot and ground reversed, hot on neutral, hot unwired, etc.
2.4	Installation of an electronic device	Test that bonding, grounding and shielding connections of equipment is in accordance with MIL-STD-188-124B for shore and MIL-STD-1310G for ships. Test that the cable management system for all equipment mounted on slides allows for the equipment to slide out of the cabinet and to rotate as applicable for maintenance.
2.5	Installation of Cat 5/5e/6/6a/7 or similar copper cable LAN drops	Test each LAN drop using a LAN Cable Tester such as Ideal Industries LANTEK 7G LAN Cable Tester, Fluke DTX CableAnalyzer Series LAN Cable Tester, Agilent technologies WireScope 350 LAN Cable Tester, or equivalent device.

Test Element	Installation Task Description	Required SOVT Item Description
2.6	Installation of cables for an electronic device (non-fiber & non-network)	For some equipment, experience has shown that a stage 2 "cold check" of cables by the SOVT team is considered a best practice to prevent serious damage to expensive equipment and to prevent significant delays. For RF, radio, transceiver, GPS, and ATM equipment, test for continuity, shorts, opens, and correct pin out.
2.7	Installation of RF cables	1) Complete a conductivity test to ensure center conductor continuity and cable braid to ground. 2) Test for cable insertion loss.
2.8	Installation of a new antenna group	1) Same tests as for installation of an electronic device. 2) For HF antennas, test infinity reading by performing Antenna resistance integrity test using a "Megger". For all rotating type antennas, test to ensure "Antenna Block Zones" (stops) are in place to prevent radiating into a structure.
2.9	Installation of a new radio transceiver set	Set/verify that all internal switch and AC power settings are in the proper operational positions in accordance with the radios technical manual or other authoritative technical documentation.

6.2.5. Section 4: Equipment Tests (Stage 3)

Section 4 of the SOVT document conducts tests to verify that the equipment is in fact functioning correctly. At this stage, the testing consists of powering up equipment, confirming that expected startup conditions are satisfied, performing configuration setup procedures, and running "offline" diagnostics or conducting tests on individual components to determine if those components are exhibiting specifically required characteristics and/or functions. Stage 3 tests are conducted in isolation from the integrated system. The SPEG is not mandating that all equipment be tested to the same level of scrutiny at Stage 3, as it is certainly reasonable to expect that some equipment may have already undergone extensive acceptance testing. For example, if the SOVT developer knows that Pre-Installation Test and Check Out (PITCO) testing shall be conducted on a specific component, then it may be sufficient at Stage 1 to "Inspect/Validate" that the component did not receive any obvious damage during shipping and that the PITCO testing was conducted and that it in fact passed. Usually equipment that passed prior PITCO testing shall be tagged as "ready for issue" or include a PITCO report with the shipment. Testing of this same "ready for issue" component at Stage 3 might then be simplified to verify that power-on and startup conditions are still correct. During test element analysis and selection, the SOVT developer shall need to determine to what extent each equipment component must be tested. The SOVT developer considers the mission of that component in the system, its known durability and reliability, any prior testing the component may have received, and any configuration setup the component requires. Table 6.3 defines some

minimum Stage 3 test requirements if the system under test includes any of these potential test elements.

Table 6–3. Minimum Stage 3 Requirements for Common Installation Tasks

Test Element	Installation Task Description	Required SOVT Item Description
3.1	Installation of an electronic device	1) If device has "Built In Testing" (BIT), observe visual and audible indicators when power is applied. 2) Conduct any additional equipment diagnostic tests available 3) Set/verify configuration (as applicable).
3.2	Installation of a network electronic device	1) Determine if the device passes internal diagnostics (as applicable). Record visual and audible indicators. 2) Set/verify configuration (as applicable). 3) For network encryption devices verify correct CIK is installed, verify firmware/software is correct, verify equipment configuration, and load keymat. 4) For wireless routers verify wireless configuration, and check signal strength for antenna orientation plus repeaters.
3.3	Installation of a Stratum One clock	Test signal quality of each interface and channel, i.e. check time, time interval, and frequency outputs.
3.4	Installation of a P/Y GPS Receiver	For units that support a test port, run diagnostics from a laptop.
3.5	Installation of an ATM switch/router	1) Same tests as Test Element 3.2. 2) Set/verify configuration of ports and operating system as applicable.
3.6	Installation of a new radio transceiver set	1) Same tests as Test Element 3.2. 2) For HF Radios, Using a "Dummy Load" and WATT Meter test forward power and proper key operation at recommended frequency increments.
3.6	Installation of a server	1) Same tests as Test Element 3.2. 2) Test disaster recovery as appropriate.
3.7	Installation of firmware	1) Verify version. 2) Complete a checksum test.
3.8	Installation of a Video Teleconference Center (VTC)	1) Same tests as Test Element 3.2. 2) Test video display functionality. 3) Test sound quality 4) Test microphone sensitivity 5) Test ancillary functionality and local and remote controls.

Test Element	Installation Task Description	Required SOVT Item Description
3.9	Installation of a Uninterruptible Power Supply (UPS)	1) Same tests as Test Element 3.2. 2) Test fail over and alarm functionality during loss of power.
3.10	Installation of a printer	1) Same tests as Test Element 3.2. 2) Test printer functionality and conduct a print quality test.
3.11	Installation of software (to include mail out)	1) Test that the correct versions of existing software resources are present and configured properly.

6.2.6. Section 5: Intra-System Tests (Stage 4)

Section 5 of the SOVT document contains test procedures that test the internal interfaces and functions of the system. Testing shall verify that interfaces between equipment or between groups of equipment within the system are functioning correctly. Testing shall also verify all system functions that can be tested within the system without any dependency on an external system. Tests could also include simulation of external interfaces or local loopback testing. For example, the SOVT for a system that includes a transmitting and receiving set might include a Stage 4 test of the transmit and receive functionality by looping the transmitter's output back through a dummy load to the receiver. Stage 4 tests verify to the extent possible that intra-system (internal) functions and interfaces contained within the system are working while keeping the system in an "off-line" status. Table 6.4 defines some minimum Stage 4 test requirements if the system under test includes any of these potential test elements.

6.2.6.1. Offline Intra-System Interface Tests

Offline interface testing can often be accomplished by conducting some simple tests that could include one or more of the following:

a. Loopback Testing. Loopback testing can often be accomplished locally to test the functionality of all equipment and interfaces from the main processing unit to the demarcation point or as close as is reasonably possible.

b. Simulated Connection Testing. Use of simulators/exercisers to emulate an on-line connection is an excellent test method when available. For example, network simulators allow engineers to simulate the effects of a sudden burst of traffic or a Denial of Service (DOS) attack.

c. Protocol Interface Testing. Commercial test devices known as a protocol analyzer, network analyzer, packet sniffer, Ethernet sniffer, or wireless sniffer can be used to intercept data, decode it, and analyze it for interface and network efficiency issues.

6.2.6.2. Offline Intra-System Functional Tests

Systems comprised of multiple equipment components will commonly have devices that only serve to enable some internal functionality or operational requirement. Equipment components such as

keyboards, mice, video displays, and dedicated printers are very common examples of devices that provide internal functionality and shall not have any interface with or any dependency upon an external system. A functional test of these internal devices and interfaces can verify that the required functionality is fully operable. Other required functionality can be tested "off-line" with test databases, internal loopbacks, simulators, etc.

Table 6–4. Minimum Stage 4 Requirements for Common Installation Tasks

Test Element	Installation Task Description	Required SOVT Item Description
4.1	Installation of a network switch, router, wireless router, or hub	1) Switches and routers - verify IOS configuration. 2) Routers - verify routing protocol. 3) Conduct PING interface testing with internal devices.
4.2	Installation of a network attached storage device	1) Conduct connectivity tests with all devices connected to network storage device. 2) Verify read/write ability from all servers using network storage device. 3) If failure recovery required, test capability. 4) Test Redundant Array of Independent Disks (RAID) functionality.
4.3	Installation of a network encryption device	Conduct connectivity tests with PING to check access port, cabling, and media converter (if applicable).
4.4	Installation of Cat 5/5e/6/6a/7 or similar copper cable LAN drops	Determine functionality of each LAN drop by conducting a PING test from the intended active drop to the activated switch port.
4.5	Installation of an ATM switch/router	Determine functionality of interfaces with PING and Network Service Access Point (NSAP). Conduct circuit tests with an ATM analyzer.
4.6	Installation of a P/Y Global Positioning System (GPS) Receiver	1) Test interface with antenna, determine signal quality. 2) If the unit has a display, determine acceptability of Figure of Merit (FOM). 3) Test each interface, i.e. check for time, time interval, frequency, position, and velocity.
4.7	Installation of a new radio transceiver set	For HF or Higher Power Capable equipment, test the transmit and receive functionality by conducting a "Loop-Back" test through dummy loads.
4.8	Installation of Modems/Baseband equipment	Conduct "Back-To-Back" or "Loop-Back" testing using other known good or checked Modems/Basebands.

Test Element	Installation Task Description	Required SOVT Item Description
4.9	Installation of a server	1) Test login with domain account. 2) Test internal network connectivity 3) Test that services being provided are working as expected. 4) Test disaster recovery features.
4.10	Installation of a workstation/laptop	If this is a domain device, 1) test ability to login with domain account, 2) determine if login is consistent with system parameters, 3) test connectivity. If this is non-domain device, 1) test login with workstation account, 2) test connectivity.
4.11	Installation of software	Test functions and interfaces of internal system. Verify that all operational modes, controls, expected outputs, and other system requirements are working after the upgrade.
4.12	Mail Out of software	Same as installation of software. Note: Assume nothing, provide detailed instructions, checklists, and pass/fail criteria (expected result).
4.13	Installation of firmware	Test applicable system functionality and interfaces with internal devices after the upgrade.
4.14	Installation of a UPS	1) Determine if IP addresses are configured (if applicable). 2) Test notification of power outage (if applicable). 3) Test graceful shut down (if applicable).
4.15	Installation of a printer	Test printer connectivity
4.16	Activation of a new intra-system terrestrial circuit	Complete a Bit Error Rate test on both the transmit and receive paths for a period of at least 1 hour using two Communication Analyzers, e.g. FIREBERD, with one positioned at end of the circuit to fully test the transmit and receive data and clocks. Note: Should a failure occur, remote loopback test beginning with the digital side of the distant device and systematically moving the location of the loopback shall isolate the failure.
	Installation of a new rotating type of Antenna	Test and observe proper Antenna positioning (using manual controls) in accordance with the equipment's technical manual or other technical authority.

6.2.7. Section 6: Inter-System Tests (Stage 5)

Section 6 of the SOVT document contains test procedures that test external interfaces and functions that are dependent on another system. Stage 5 testing shall verify that these external interfaces between the installed system and another system are functioning correctly. Stage 5 testing also verifies all remaining system functions that can non-intrusively be tested "off-line" with the add-on of functional external interfaces. Using the example again of a system that includes a transmitting and receiving set, a Stage 5 battery of tests could maintain the transmit and receive loopback through the dummy load, while progressively expanding the testing until all external interfaces providing source data for the broadcast are operative. In this example, the system remains "off-line" or "off-the-air" until all Stage 5 battery of tests have verified that all required functionality is operating correctly. At this point, all that remains is to put the system "on-line" or "on-the-air" and conduct any operational, Stage 6, tests that are required. Table 6.5 defines some minimum Stage 5 test requirements if the system under test includes any of these potential test elements.

6.2.7.1. Inter-System Interface Tests

Inter-system interface testing often consists of conducting non-intrusive testing across system interfaces. This testing could include the use of Communication Analyzers, both at the distant and local end, to verify both transmit and receive paths and timing. It may also include the use of remote loopbacks. It may include non-intrusive functional testing with the distant device and system. For example, "pinging" across the interface to the distant device would be non-intrusive to the operations of that system.

6.2.7.2. Inter-System Functional Tests

At this stage in the testing, the system under test is almost ready for "on-line" or operational testing. The SOVT developer needs to plan and synchronize the tests so that the system can be taken from an "off-line" state to an almost "on-line" state and all that remains is a simple and reversible step to proceed to Stage 6, operational testing. In the example given previously using a transmitter and receiver, "on-line" or operational testing is defined to begin at the moment the transmitter is placed "on-the-air". All testing of external interfaces and functionality dependent on other systems would be non-intrinsically tested during Stage 5 prior to the final act of pulling the patch cord that would place the system "on-the-air". The point of this discussion is that the SOVT developer shall need to determine what is the defining moment when the system under test shall be operational or "on-line". All testing remaining after Stage 4 up until the moment the system is considered as "on-line" must be carefully planned and synchronized to occur during Stage 5 testing.

Table 6–5. Minimum Stage 5 Requirements for Common Installation Tasks

Test Element	Installation Task Description	Required SOVT Item Description
5.1	Installation of a network switch, router, wireless router, or hub	1) Router - verify routing protocol. 2) Conduct PING interface testing with external devices. If PING is blocked, check ARP table of each device. 3) Wireless router – PING to wireless user
5.2	Installation of a network encryption device	Complete a "call connect" test with remote cryptographic unit.

Test Element	Installation Task Description	Required SOVT Item Description
5.3	Installation of an ATM switch/router	Test each external interface. Using in band management, determine if device can see the other switches within domain. Check Private Network Node Interface (PNNI) signaling.
5.4	Installation of a GPS Receiver or Stratum One clock	Test that each interface with external systems using the unit's time, time interval, and frequency outputs is functional. For GPS units also test position and velocity outputs.
5.5	Installation of a Server	Test connectivity to server from outside system (i.e. off-platform, off-ship)
5.6	Installation of software	Test functionality and interfaces with external systems. Validate that all operational modes, controls, expected outputs, and other system requirements are working after the upgrade.
5.7	Mail Out of software	Same as installation of software. Note: Assume nothing, provide detailed instructions, checklists, and pass/fail criteria (expected result).
5.8	Installation of a VTC	Establish connections with other VTCs (e.g. point to point, through bridge) and test functionality and quality.
5.9	Activation of a new inter-system terrestrial circuit	Complete a Bit Error Rate test on both the transmit and receive paths for a period of at least 1 hour using two Communication Analyzers, e.g. FIREBERD, with one positioned at end of the circuit to fully test the transmit and receive data and clocks. Note: Should a failure occur, remote loopback test beginning with the digital side of the distant device and systematically moving the location of the loopback shall isolate the failure.

Test Element	Installation Task Description	Required SOVT Item Description
5.10	Installation of a Network Security Firewall	Conduct security testing to determine the vulnerability of the Firewall setup to different attacks like Denial of Service (DOS), distributed DOS, and application/port vulnerabilities. 1) Test management access. Local and remote management access testing shall be conducted to verify that unauthorized access cannot be established to the configuration and remote console. 2) Perform an exhaustive TCP and UDP port scan of the trusted network and Firewall to identify all hosts with TCP & UDP services running or in a listening state. Verify any information of hosts hidden by the security policy cannot be compromised. 3) Perform an Operating System Detection/Stack Fingerprinting test to determine the operating systems of all hosts within the trusted network and verify that any information of hosts hidden from the Security Policy cannot be compromised. 4) Perform a network ping sweep test of the trusted network from the public network to verify that the Network Ping Sweep cannot compromise IP address or other information of any host that is not permitted access from the Public Network. 5) Perform DOS Vulnerability Assessment testing to determine if the Firewall can be made inoperable when attached with common types of DOS attacks. 6) Perform ActiveX/Java Applet Filter testing to verify that the Firewall shall block ActiveX and Java applets when accessing any Web site

6.2.8. Section 7: Operational Tests (Stage 6)

The first procedure of Stage 6 testing is the cutover of the newly installed or upgraded system to an "on-line" or operational status. Section 7 provides test procedures that test functions, which could not be tested "off-line". This stage of tests may include the insertion and analysis of defined patterns, automatic error generators, or a pre-defined data sample into an operational "on-line" system or equipment in order to verify that the system is operating as intended. A specific operational scenario may also be tested in order to verify that the system operates in that specific operational situation. It is also conceivable that Stage 6 shall only consist of a limited period during which normal operations are observed and results recorded. Stage 6 only includes testing that can be conducted pier side or without any at-sea testing. Table 6.6 defines some minimum Stage 6 test requirements if the system under test includes any of these potential test elements.

Table 6–6. Minimum Stage 6 Requirements for Common Installation Tasks

Test Element	Installation Task Description	Required SOVT Item Description
6.1	Installation of a network switch, router, wireless router, hub, or encryption device	Design and conduct end to end data flow tests that verify end to end operational capability. For wireless router, end to end data flow test should be with a wireless end user.
6.2	Installation of an ATM switch/router	Design and conduct end to end data, voice, and video operational tests.
6.3	Installation of a new radio transceiver set	Design and conduct an end to end over-the-air test with an end user.
6.4	Installation of Modems/Baseband equipment	Design and conduct an end to end test through both ends of baseband and modem equipment.
6.5	Installation of RF cables	Conduct a Voltage Standing Wave Ratio (VSWR) test through the transmission line and antenna. Refer to the technical specifications of the Cable/Antenna for Pass/Fail ratio criteria.
6.6	Installation of a Server	Design and conduct end to end tests of the server functionality, with end users performing test procedures. Test that all interfaces and services are functioning as expected.
6.7	Installation of software	Design and conduct end to end tests of operational capability, with end users performing test procedures.
6.8	Mail Out of software	Same as installation of software. Note: Assume nothing, provide detailed instructions, checklists, and pass/fail criteria (expected result).
6.9	Installation of firmware	Same as installation of software.
6.10	Activation of a new terrestrial circuit	Using a Communications Analyzer; perform non-intrusive in-service monitoring of circuit performance during an operational 72 hour period.

6.2.9. Section 8: At-Sea and Other Special Tests (Stage 7)

Section 8 provides test procedures and pass/fail criteria that are specifically aimed at conducting a test or a series of tests in a real time “At-Sea” scenario. One of the most common examples of “At-Sea” Stage 7 testing is that required to test RF systems and antennas that cannot be conducted while in port. It could also include the testing of a specific system function that can only be tested thoroughly “At-Sea”. A navigation system, for example might require testing “At-Sea”. A system

that depends on a ship to shore RF communication path may need to be tested “At-Sea”. At-Sea testing may also be concurrent with sea trials, acceptance trials, underway trials, or post repair trials. Stage 7 tests may also include “other special tests” such as those that might be conducted with operationally deployed mobile systems. There are no minimum test requirements given for Stage 7.

6.2.10. Appendix A – Configuration Audit Results

The Appendices of the SOVT document provide forms that are used to record system configuration, test results, test discrepancies, and test acceptance. Appendix A of the SOVT document shall provide forms to record the system hardware and software configuration. See the SOVT template example contained in Appendix A.

6.2.11. Appendix B – Record of SOVT Discrepancies

Appendix B of the SOVT document shall contain forms for recording SOVT discrepancies that were found during testing. Both those discrepancies found and corrected as well as those found and not corrected shall be recorded. See the SOVT template example contained in Appendix A.

6.2.12. Appendix C – SOVT Signature Page

Appendix C of the SOVT document shall contain a prepared page for signature by the SPAWAR test conductor and the customer attesting that the test procedures found in the SOVT document were completed, that their results were properly recorded in the tables provided within each section, and any discrepancies found during testing and their current status were listed in Appendix B.

7. Platform SOVT Document Development

The Platform SOVT is the formal document used to test and document that the installed system/equipment is fully operational. The Platform SOVT document is derived from the approved System SOVT document developed in Section 6.0. The SOVT manager and platform personnel shall perform the SOVT in accordance with an approved Platform SOVT document.

7.1. Single System Installation

7.1.1. Test Element Analysis and Selection

The Platform SOVT is a unique version of the System SOVT used to test the precise configuration on a given platform. The specific configuration of the system installed, internal and external interfaces and any required coordinated testing must be identified and incorporated into the Platform SOVT. As stated the System SOVT forms the basis for the Platform SOVT, but the deletion of test elements not applicable to that specific installation may be required and the addition of test elements required for external interfaces or differences in configuration may also be required. Section 6.2 of the SPEG provides guidance for the System SOVT development on how to identify, select, and assign test elements to a test stage. To the extent that additional test elements are required in the Platform SOVT, the same process identified in Section 6.2 shall be followed. If test elements are deleted from or added to the Platform SOVT, then the functional block diagram that shows the test boundary shall also need to be updated to reflect the actual configuration and interfaces under test. In summary, the following actions are required:

- The configuration of the platform to be tested is determined via a platform check or by existing documentation such as detailed drawings. Only those tests and procedures that are specific to the platform shall be present in the final document.
- For the Platform SOVT all applicable testing and procedures residing in the System SOVT shall be used. Additional test elements and procedures shall be added if applicable to that platform.
- The final Platform SOVT shall have no non-applicable (N/A) content.
- The test boundary diagram shall accurately depict the actual configuration and interfaces under test.

7.1.2. Document Approval and Storage

The Platform SOVT contains the same content requirements as the System SOVT. This includes an approval statement immediately following the cover page. The approval statement shall indicate that the document has been approved for use by those who have been designated this authority. For Platform SOVT documents, the approval authorities are the SOVT Developer and the Program/Project Manager. See the SOVT template in Appendix A. Section 4 provides guidance on the process to be used for review and approval. See the SOVT template in Appendix A. Appendix B contains a checklist to aid in the SOVT review. The final approved Platform SOVT document is uploaded to the SOVT repository in a Microsoft Word compatible file format. Upon completion of SOVT execution, the signed SOVT along with all recorded results and discrepancies (if any) is uploaded to the SOVT repository in PDF file format.

7.2. Multiple System Installation

It is becoming more common to see large installations consisting of many different systems. For example, the recent outfitting of some new platforms has consisted of over one hundred different systems. Most systems do depend on acquiring or providing control data or information through other systems. Therefore, testing of multiple system installations tends to be more complex and requires more detailed planning and synchronization so that the functionality required by each system for testing is available at the right time. The following provides a preferred process for developing an overarching plan for a consolidated installation testing effort.

7.2.1. Analyzing and Organizing System Test Requirements

The first part of this process requires that the dependencies of each system be determined. If a system requires information, control data, timing, etc. from another system to test functionality, then a dependency exists. This information, control data, timing, etc could be provided through a direct point to point interface or through a network interface. If two systems both require information from each other to properly test functionality, then they are co-dependent. If the SOVT developer does not already know what dependencies exist, the installation drawings, systems descriptions, or technical manuals are good sources for making this determination. As the relationships/dependencies between systems are determined, they can easily be documented in a Dependency Table. Table 7-1 below provides an example that can also be used as a template. Those systems that are not dependent on any other system, but do have other systems dependent on them, are enabler systems and should be placed at the top of the Dependency Table. Systems 1 and 2 in Table 7-1 are examples of this type of systems. Those systems that are not dependent on any other system and do not have any system dependent on them are stand alone systems and they should be placed at the bottom of the Dependency Table. System 26 in Table 7-1 is an example of a system that stands alone and has no relationship with any other system. The reason for this approach shall become apparent in the next part of the process.

Table 7–1. Dependency Table

System	Nomenclature/System Name	Dependencies (System)	Estimated SOVT Duration (days)
1	System Name	none	7
2	System Name	none	2
3	System Name	1	8
4	System Name	3	2
5	System Name	4	1
6	System Name	5	10
7	System Name	6	2
8	System Name	2, 3	4
9	System Name	8	2
10	System Name	9	20
11	System Name	10	4
12	System Name	1, 9, 7	20
13	System Name	12, 15, 16	4
14	System Name	9, 7	18
15	System Name	13, 14	3
16	System Name	11	1
17	System Name	17	18
18	System Name	17	4
19	System Name	13, 15, 18	7
20	System Name	1	6
21	System Name	20	1
22	System Name	21	10
23	System Name	1, 3, 22	5
24	System Name	23	2
25	System Name	24	5
26	System Name	none	2

7.2.2. Preparing for SOVT Execution

The second part of this process involves mapping the Dependency Table into a Network Diagram and ultimately into a Master Schedule that can be used to coordinate all the different SOVT efforts into an orchestrated event. Figure 7-1 depicted below is a Network Diagram based upon Table 7-1. Please note that systems 1 and 2 are enabler systems that do not have any prior dependencies. System 26 is an example of a stand alone system. In this example, systems 13 and 15 are co-dependent on each other as well as on other systems. Also note that while systems 12 and 23 are both dependent on the availability of system 1 (see Table 7-1), that no line was drawn from systems 12 or 23 to system 1 in the Network Diagram. Both 12 and 23 already have dependencies with other systems that have a traceable dependency back to system 1, so there is no need to draw a separate line to system 1. With the completion of a Network Diagram, the system relationships are well understood and mapped out in an easy to follow format. From the Network Diagram, a critical path can easily be determined by adding up the estimated duration of each SOVT along each path and finding the path with longest required timeframe. In this example, the critical (longest) path is 61 days. A Master Schedule should also be developed in Microsoft Project or equivalent that uses the system dependencies, estimated SOVT durations, and other factors such as resource and space availability constraints. In conclusion, consolidated SOVT events for very complex multiple system installations can readily be mapped out and then organized through this two step process.

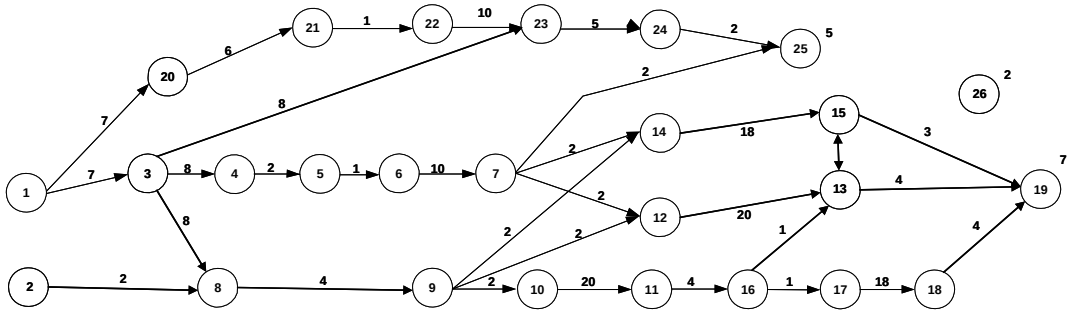

Figure 7–1. Network Diagram

7.2.3. Synchronizing and Scheduling SOVT Execution

A best practice in the case of large multiple system installations, is for the SOVT Manager to prepare a compiled Platform SOVT book or binder that includes an index to all the individual Platform SOVT documents, the Dependency Table, the Network Diagram, a Master Schedule, and any other transition planning or coordination details required to organize the roles, responsibilities, and timing of a potentially large workforce of SOVT and platform personnel.

In preparation for the Platform SOVT execution, there are several actions that need to be completed prior to departure to the platform. For single system installations, these actions are relatively straight forward and may include:

- Preparing the SOVT document
- Obtaining approval for the SOVT document
- Planning a SOVT in-brief
- Scheduling the SOVT team
- Organizing test equipment and tools
- Sending security clearances

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Appendix A: SOVT Template

System Operational Verification Test

(SOVT)

For

Type System Name Here

Type System Variant Here

Platform: (for System SOVT, leave blank)

Date Performed: (yyyy/mm/dd) (for Platform SOVT only; refers to date commenced)

4720
Code/XXX
Day Month Year

From: Document Approving Official, Organization (Code)

Subj: Record of Approval

1. System Operational Verification Test (SOVT) document number *(document or project number)* for *(system x) (variant y)* is approved for use. This document is a:
☐ Standard SOVT plan for this system and variant; or
☐ Platform SOVT for *(platform/command name).*

2. This document is certified to be technically suitable and in compliance with the SPAWAR SOVT Preparation and Execution Guide:

(Organization name) – (document owner name),(email address), (telephone number)

(Official's Signature)

(Official's Name)
(Official's Title)

3. I hereby approve this document for use in testing systems as defined above.

(Organization name) – (approving authority name),(email address), (telephone number)

(Official's Signature)

(Official's Name)
(Official's Title)

Distribution:
Electronic only, (name of SOVT repository), website: (address)

Record of Changes

Version	Date	Changed by	Description of Change (List all approved CRF numbers)

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Section 1. Introduction and Administration

A Lean Six Sigma study was undertaken by SPAWAR to improve the SOVT process. This document complies with the SOVT standardized format and test requirements. The signed approval statement certifies that the document has been approved by a competent authority for use to test this system. The expected benefits for our SPAWAR customers as a result of the SOVT process improvements are:

- Better test documentation
- Better understanding of roles and responsibilities
- Improved readiness for operational units through improved testing
- Reduced operational risk
- Fewer test discrepancies and improved tracking and resolution

SPAWAR defines SOVT as a test or a battery of tests that verifies that the installed or modified equipment, systems, interfaces with existing systems, and systems impacted by the installation are properly installed and do operate as intended at the platform specific location and environment.

For the system being tested, platform personnel witnessing the SOVT should be basic system qualified operators and/or maintainers at a minimum.

1.1 Purpose

The purpose of this document is to provide the procedures and criteria as applicable to verify safety, security, environmental conditions, signal connectivity, configuration (i.e., strapping, ECs, etc.), internal and external system interfaces, and operating functionality of the installed equipment and any impacted equipment/systems.

1.2 Scope

The scope of this SOVT document is limited to testing *(cite system and subsystem names as applicable).* It also includes testing requirements of interfaces with required supported or related systems to include *(name those expected systems external to the test boundary for which interfaces need to be tested). (Note: If the SOVT document is intended only for a specific platform, a given ship class, a type of shore platform, or a user customer base then so state the intended scope limitation.)*

1.3 References

The following references have direct applicability to the system under test. *(List those documents that have value either for understanding the system under test, for customizing a test procedure for a specific installation, or even for troubleshooting a failed test. For example, a standardized system SOVT document would reference key documents such as that system's Installation Requirements Drawings (IRDs), appropriate technical manuals, system configuration setup documents, etc.)*

1.4 Points of Contact

The Points of Contact are: *(Provide names as appropriate. If document is the system standard SOVT, then leave Project Engineer, SOVT Manager, and platform representatives blank.)*

System Engineer or Technical Lead:

In-Service Engineering Activity (ISEA) Representative:

Installation Project Engineer:

SOVT Manager:

Platform Witness:

Add additional POC as necessary (e.g., CO, XO, Navigator, LPO, EMO)

1.5 Safety Measures

The Safety Measures are:

(Be thorough. Do not risk injury or death by not providing adequate safety measures. In addition to generalized guidance, be specific when known hazards exist. Cite the specific safety measures, the specific location, and the nature of the known hazard. For example, if a Safety Measure is "Never measure voltage potential in excess of 1000 volts by means of flexible test leads or probes", then identify the locations where the high voltages may be encountered.)

(Safety measures could address but not be limited to electrical hazards, radiation hazards, hazardous materials, confined space entry (hazardous gases), fire watches, weight handling, tag out requirements, and personal protective equipment.)

1.6 Security Measures

The Security Measures are associated with this system are:

(Address all security issues related to the system under test or resulting from the specific tests. Common security issues include required security clearance of personnel, handling and storage of classified equipment, classification of initially unclassified components after operational testing, specific COMSEC/KEYMAT requirements, and classification of supporting documentation.)

1.7 System Description

A System Description is provided in the following paragraphs that describes the system under test. Figure 1-1, Test Boundary, defines the test boundary for the purposes of this SOVT document.

(Provide a detailed description of the system under test. Figure 1-1 is a Functional Block Diagram depicting all hardware components and interfaces under test. Each block in the diagram shall represent an independent functional component. External and internal interfaces shall be shown and the external equipment or systems that interface with the equipment or system shall also be shown. See Figure 6-1 for an example.)

1.8 Support Equipment and Software

The Support Equipment and Software required for conducting the tests contained within this document are listed below along with who is providing it:

(List all required support and test hardware, software, and any other materials needed to successfully complete the testing described in the SOVT document. The organization and/or individual responsible for supplying each item needs to be identified. This could include the Program Office or their ISEA for Special Purpose Electronic Test Equipment (SPETE), the receiving Command for General Purpose Electronic Test Equipment (GPETE), and the installation activity for other installation related specialized test equipment, software, or material.)

Section 2. Inspection and Validation Tests (Stage 1)

The Inspection and Validation Test requirements and pass/fail criteria are defined within this section. Part of the Stage 1 tests requires that a configuration audit be performed. The results of the audit shall be recorded in Appendix A, Configuration Audit Results. Other Stage 1, inspection and validation procedures and results shall be recorded in the table below.

(Provide procedures that complete applicable Stage 1 inspection requirements defined in Table 6-1 of the SOVT Preparation and Execution Guide (SPEG). Complete test element analysis, selection and assignment as described in Section 6.1 in the SPEG. Prepare procedures that inspect and validate all selected test elements that are assigned a Stage 1 test requirement. A recommendation is that an identification number be assigned to each test in the format of 1-#, where number 1 represents Stage 1 and # represents a sequential number assigned to each test within this section.)

(The inspection should not only validate the configuration of the hardware and software, but the existence of safety or security measures, that correct installation standards were observed, that proper space/clearance is allowed for personnel and equipment, that adequate cable management methods were employed to provide stress relief and to separate red and black cables, and the quality of workmanship to include labeling and finishing details.)

Inspection and Validation Tests

Test No.	Inspection or Test Title or Description	Pass	Fail	Resolved	Work-around	Initials SPAWAR Rep Platform Rep
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	

Section 3. Cold Checks (Stage 2)

The Cold Checks testing requirements, procedures, and pass/fail criteria are contained within this section. These tests are typically conducted prior to applying power to the system. These tests verify that the power distribution system, the ground connections, and the cable connections are all functioning within allowed tolerances and specifications. The test procedures and results of the Stage 2 tests shall be recorded in the table below.

(Provide procedures that complete applicable Stage 2 test requirements defined in Table 6-2 of the SPEG. Complete test element analysis, selection and assignment as described in Section 6.1 in the SPEG. Prepare procedures that test all selected test elements assigned a Stage 2 test requirement. A recommendation is that an identification number be assigned to each test in the format of 2-#, where number 2 represents Stage 2 and # represents a sequential number assigned to each test within this section.)

Cold Checks

Test No.	Inspection or Test Title or Description	Pass	Fail	Resolved	Work-around	Initials SPAWAR Rep Platform Rep
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	

Section 4. Equipment Tests (Stage 3)

The Equipment Test requirements, procedures, and pass/fail criteria are contained within this section. These are tests that verify that the equipment is in fact functioning correctly. At this stage, the testing consists of powering up equipment, confirming that expected startup conditions are satisfied, performing configuration setup procedures, and running "offline" diagnostics or conducting tests on individual components to determine if those components are exhibiting specifically required characteristics and/or functions. The test procedures and results of the Stage 3 tests shall be recorded in the table below.

(Provide procedures that complete applicable Stage 3 test requirements defined in Table 6-3 of the SPEG. Complete test element analysis, selection and assignment as described in Section 6.1 in the SPEG. Prepare procedures that test all selected test elements assigned a Stage 3 test requirement. A recommendation is that an identification number be assigned to each test in the format of 3-#, where number 3 represents Stage 3 and # represents a sequential number assigned to each test within this section)

Equipment Tests

Test No.	Inspection or Test Title or Description	Pass	Fail	Resolved	Work-around	Initials SPAWAR Rep Platform Rep
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	

Section 5. Intra-System Tests (Stage 4)

The Intra-System Test requirements, procedures, and pass/fail criteria are contained within this section. These procedures test the internal interfaces and functions of the system. The test procedures and results of the Stage 4 tests shall be recorded in the table below.

(Provide procedures that complete applicable Stage 4 test requirements defined in Table 6-4 of the SPEG. Complete test element analysis, selection and assignment as described in Section 6.1 in the SPEG. Prepare procedures that test all selected test elements assigned a Stage 4 test requirement. A recommendation is that an identification number be assigned to each test in the format of 4-#, where number 4 represents Stage 4 and # represents a sequential number assigned to each test within this section)

Intra-System Tests

Test No.	Inspection or Test Title or Description	Pass	Fail	Resolved	Work-around	Initials SPAWAR Rep Platform Rep
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	

Section 6. Inter-System Tests (Stage 5)

The Inter-System Test requirements, procedures, and pass/fail criteria are contained within this section. These procedures test the external interfaces between the installed system and other systems. Stage 5 testing also verifies all remaining system functions that can non-intrusively be tested "off-line" with the add-on of functional external interfaces. The test procedures and results of the Stage 5 tests shall be recorded in the table below.

(Provide procedures that complete applicable Stage 5 test requirements defined in Table 6-5 of the SPEG. Complete test element analysis, selection and assignment as described in Section 6.1 in the SPEG. Prepare procedures that test all selected test elements assigned a Stage 5 test requirement. A recommendation is that an identification number be assigned to each test in the format of 5-#, where number 5 represents Stage 5 and # represents a sequential number assigned to each test within this section)

Inter-System Tests

Test No.	Inspection or Test Title or Description	Pass	Fail	Resolved	Work-around	Initials SPAWAR Rep Platform Rep
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	

Section 7. Operational Tests (Stage 6)

The Operational Test requirements, procedures, and pass/fail criteria are contained within this section. These procedures cutover the newly installed or upgraded system to an "on-line" or operational status and tests functions that could not be tested "off-line". This stage of tests may include the insertion and analysis of defined patterns, automatic error generators, or a pre-defined data sample into an operational "on-line" system or equipment in order to verify that the system is operating as intended. A specific operational scenario may also be tested in order to verify that the system operates in that specific operational situation. It is also conceivable that Stage 6 shall only consist of a limited period during which normal operations are observed and results recorded. The test procedures and results of the Stage 6 tests shall be recorded in the table below.

(Provide procedures that complete applicable Stage 6 test requirements defined in Table 6-6 of the SPEG. Complete test element analysis, selection and assignment as described in Section 6.1 in the SPEG. Prepare procedures that test all selected test elements assigned a Stage 6 test requirement. A recommendation is that an identification number be assigned to each test in the format of 6-#, where number 6 represents Stage 6 and # represents a sequential number assigned to each test within this section)

Operational Tests

Test No.	Inspection or Test Title or Description	Pass	Fail	Resolved	Work-around	Initials SPAWAR Rep Platform Rep
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	

Section 8. At-Sea and Other Special Tests (Stage 7)

The At-Sea and Other Special Test requirements, procedures, and pass/fail criteria are contained within this section if applicable. These procedures are specifically aimed at conducting a test or a series of tests in a real time "At-Sea" scenario. The test procedures and results of the Stage 7 tests (if applicable) shall be recorded in the table below.

(Complete test element analysis, selection and assignment as described in Section 6.1 in the SPEG. Prepare procedures that test all selected test elements assigned a Stage 7 test requirement. A recommendation is that an identification number be assigned to each test in the format of 7-#, where number 7 represents Stage 7 and # represents a sequential number assigned to each test within this section)

At-Sea and Other Special Tests

Test No.	Inspection or Test Title or Description	Pass	Fail	Resolved	Work-around	Initials SPAWAR Rep Platform Rep
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	
		☐	☐	☐	☐	

Appendix A. Configuration Audit Results

A Configuration Audit was performed. The results of the audit records the hardware and software configuration of the system and all components within the defined test boundary.

Record of Installed Equipment and Software

Project XXXXXX Date: Time: Sheet 1 of __1__

Activity Representative's Printed Name	Activity Representative's Signature	Activity Representative's Written Initials	Activity Representative's Organization & Code

Item Description	Manufacturer or Supplier	Part No. or Version No.	NSN	Serial No.	Location
Device name and model number		Part number of equipment or version number of software	If applicable	Serial number of equipment or software media	Room number, row number, bay number, cabinet unit number, etc.

Appendix B. Record of Resolved and Unresolved SOVT Discrepancies

The Record of Resolved and Unresolved SOVT Discrepancies that resulted from tests conducted during Stage 1 to Stage 7 are contained within this Appendix.

Test No.	**Remarks** All SOVT discrepancies should be explained on this remarks sheet. (e.g. Cable labels were hand written in violation of the installation drawing requirements and associated standards.) A given test could have more than one discrepancy and so allowance is given that multiple remarks may be necessary for each test.	**Status** O-Open OW-Open with Work-around R-Resolved	**Required Action for Open Issues** (to include any workarounds)

Appendix C. SOVT Signature Page

The SOVT Signature Page is signed both by SPAWAR test conductor and the platform or ship personnel that witnessed the testing. For the system being tested, platform personnel witnessing the SOVT should be basic system qualified operators and/or maintainers at a minimum. These individuals are attesting that the required tests as approved by the competent technical authority were properly completed, that results were properly recorded in tables provided within each section, and that any discrepancies found during testing and their current status were recorded in Appendix B. The signing of the SOVT is commonly seen as the point in time when the system is deemed operational, quite possibly with a work around if there are any open discrepancies. The only valid reason for not signing the SOVT is if the testing is incomplete and the system is not operational. The final acceptance of the system is completed through the "Alteration/Installation Completion Report" and "Completion/Acceptance Message."

Platform or Ship: (Identify where the project took place)
System: (Identify name and variant of system) **Project** XXXXXX
The undersigned attest that:
a. All of the test elements identified in the SOVT were successfully completed.

b. Open discrepancies (if any) are recorded in Appendix B.

SOVT MANAGER & PLATFORM WITNESS SIGNATURES		
Printed Rank & Name	Organization and Code	Signature and Date

Appendix B: SOVT Document Approval Checklist

SOVT Document Approval Checklist
Technical Authority/ Systems Engineering Technical Review

Date(s) of Review: _____Reviewer:_____

Document to be Reviewed:_____

The System Operational Verification and Test (SOVT) process and documentation is for installing activities to verify and demonstrate that the newly installed equipment, system, or systems and all other affected systems are properly installed and operating correctly. This SOVT checklist provides guidance to reviewing staff on core requirements that all activities should follow to ensure adequate engineering rigor is instilled within the process to better improve SOVT quality and success.

General Criteria

Criterion		*Included*	*Comment No.*	*Page No.*	*Line No.*	*Comment Type: 1 - Critical 2 - Major 3 - Minor*	*Reviewer Recommendation & Rationale*	*Adjudication Action: A = Accept P = Partially accept (explain) R = Reject (explain)*
Cover Sheet								
	Did the cover sheet include a document title, a document or project identification number, a distribution statement, and the date the document was approved?							
Approval Statement								
	Did the approval statement record under whose authority the SOVT document was approved for use?							
Front Matter								
	Is there a record of changes, table of contents, and listings of any tables, figures, and appendices?							
Format (Font, etc..)								
	Does the document follow Appendix A template?							

Test Element Analysis, Selection and Assignment								
1. Analysis of System Functional and Key Performance Characteristics								
	Is a functional block diagram provided and does it identify the discrete functions that each single unit of hardware, or closely related group of hardware units for testing purposes?							
	Does each block on the diagram ensure that each action or service performed by the equipment under test is included in the list of functions?							
	Is any system function not previously identified through analysis of its component parts listed?							
2. Analysis of Interface Requirements								
	Do the interfaces identified in the functional block diagram adequately identify what interfaces to include in test elements?							

3. Test Element Selection								
	A pre-requisite condition or assumption is that compliance with system design specifications have already been tested and verified previously during DT/OT. If this pre-requisite condition is true, did test element screening select those test elements that meet one or more of the following conditions?: • Test element is required to guarantee safe operation; • Test element is essential to proving equipment and system performance and operation; • Test element performance is essential to operation of other equipment or systems; • Test element performance can be seriously degraded by shipping, installation, the actual operational environment, or by post installation adjustment; and • Interface test element must be verified prior to operation of the equipment or system under test.							
	Is there one consolidated list of potential test elements?							

4. Assigning Test Elements to a Test Stage								
	Was a test element assignment map created and provided?							

Criteria Checklist

	Criterion	*Included*	*Comment No.*	*Page No.*	*Line No.*	*Comment Type: 1 - Critical 2 - Major 3 - Minor*	*Reviewer Recommendation & Rationale*	*Adjudication Action: A = Accept P = Partially accept (explain) R = Reject (explain)*
Document Contents								
Section 1.1 Purpose								
	Does the SOVT have an adequate brief purpose statement included that states that the purpose the specific system SOVT document is to provide a battery of tests that can be used to verify that specific system or sub-system is properly installed and is operating correctly?							
Section 1.2 Scope								
	Does the SOVT have a scope statement that provides an abbreviated high level definition of what is being tested? Does it include the system and/or sub-systems and the specific variant under test?							
	Does the SOVT document specifically state if it is intended only for specific platform, a given ship class, a type of shore platform, or a user customer base?							

Section 1.3 References								
	Do the references provided have a direct correlation to the system under test and have some value either for understanding the system under test, for customizing a test procedure for a specific installation, or even for troubleshooting a failed test? For example, a standardized system SOVT document would reference key documents such as that system's Installation Requirements Drawings (IRDs), appropriate technical manuals, system configuration setup documents, etc.							
Section 1.4 Points of Contact								
	Are key points of contact included in the system SOVT to include; Assistant Program Manager (APM) or equivalent Project Manager, System Engineer/Architect or equivalent technical lead, In-service Engineering Activity (ISEA) representative, and the SOVT author?							
	Is a place holder field for the Project Engineer, SOVT Manager, and Platform Representative included?							

Section 1.5 Safety Measures								
	Are all known safety hazards associated with the inspections and testing identified in this section and specific safety guidance given?							
	If a specific hazard is known then is the specific location and nature of the hazard identified?							
Section 1.6 Security Measures								
	Are common security issues included such as required security clearance of personnel, handling and storage of classified equipment, classification of initially unclassified components after operational testing, specific COMSEC/KEYMAT requirements, and classification of supporting documentation?							
Section 1.7 System Description								
	Is there a description of the system under test as well as clearly defined test boundary?							
	Is the required Functional Block Diagram depicting all hardware components and interfaces under test included?							
	Does each block in the diagram represent an independent functional component?							
	Are external and internal interfaces shown and are the external equipment or systems that interface with the equipment or system also shown?							

Section 1.8 Support Equipment and Software								
	Are all required support and test hardware, software, and any other materials needed to successfully complete the testing described in the SOVT document?							
	Is the organization and/or individual responsible for supplying each item identified?							
	Are any testing support equipment, software, or material to be provided by the installation activity or SOVT team identified?							
Section 2 Stage 1 Inspection and Validation Tests								
	Is a checklist of specific requirements to inspect and validate/verify provided IAW the test element assignment mapping and requirements of Table 6-1 of SPEG.							

Section 3.0 Stage 2 Cold Checks								
	Are tests provided that verify that the power distribution system, the ground connections, and the cable connections are all functioning within allowed tolerances and specifications IAW Table 6.2 minimum Stage 2 test requirements and are they clearly and adequately written?							
Section 4.0 Stage 3 Equipment Tests								
	Are tests provided that consider the mission of the component in the system, its known durability and reliability, any prior testing the component may have received, and any configuration setup the component requires provided IAW Table 6.3 and are they clearly and adequately written?							
Section 5.0 Stage 4 Intra-Systems Tests								
	Are tests provided that verify to the extent possible that intra-system (internal) functions and interfaces contained within the system are working while keeping the system in an "off-line" status IAW Table 6.4 minimum Stage 4 test requirements?							

Section 6.0 Stage 5 Inter-System Tests								
	Are tests provided that verify that external interfaces between the installed system and another system are functioning correctly IAW Table 6.5minimum Stage 5 test requirements?							
Section 7.0 Stage 6 Operational Tests								
	Are there test procedures that test functions, which could not be tested "off-line"and a specific operational scenario included to verify that the system operates in that specific operational situation IAW Table 6.6 for Stage 6 tests?							
Section 8.0 Stage 7 At-Sea and Other Special Tests								
	Are there test procedures and pass/fail criteria that are specifically aimed at conducting a test or a series of tests in a real time "At-Sea" scenario provided? At-sea scenarios may include RF systems and antennas that cannot be conducted while in port or testing of a specific system function that can only be tested thoroughly "At-Sea". (Note that there are no minimum test requirements given for Stage 7 in the SPEG).							

Appendix A Configuration Audit Results								
	Is there an Appendix A that provides forms to record the system hardware and software configuration IAW the SOVT template example contained in Appendix A of the SPEG?							
Record of Test Results								
	Is there a table within each section of the SOVT document that is used to record all observed test data and pass, fail, resolved, or workaround results IAW the SOVT template example contained in Appendix A of the SPEG?							
Appendix B Record of SOVT Discrepancies								
	Is there an Appendix B of the SOVT document which contains forms for recording SOVT discrepancies that were found during testing to include those discrepancies found and corrected as well as those found and not corrected IAW SOVT template example contained in Appendix B of the SPEG?							

Appendix C SOVT Signature Page								
	Is there an Appendix C of the SOVT document which contains a prepared page for signature by the SPAWAR test conductor and the customer attesting that the test procedures found in the SOVT document were completed and that their results were properly recorded in the tables within each section of the SOVT document, and that any discrepancies found during testing and their current status were listed in Appendix B?							
Overall Assessments								
Include here the overall assessment of this System SOVT based on the number of Critical, Major and Minor findings. This assessment should be based on the risk associated with going forward with this System SOVT to a Platform SOVT development and execution and the ability to adequately verify that the installed or modified equipment, systems, interfaces with existing systems, and systems impacted by the installation are properly installed and do operate as intended at the platform specific location and environment.								

Criteria Checklist References

References
SOVT Preparation and Execution Guide (SPEG)

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Appendix C: Acronyms Used in this Document

ACR: Alteration Completion Report

AIT: Advanced Intelligent Tape

APM: Assistant Program Manager

ASME: American Society of Mechanical Engineers

ATM: Asynchronous Transfer Mode

C4ISR: Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance

CAO: Competency Aligned Organization

COMSEC: Communication Security

EC: Engineering Change

GPS: Global Positioning System

I-4M: Installation Minus 4 Months

IAW: In Accordance With

IPT: Integrated Product Team

ISEA: In-Service Engineering Agent

KEYMAT: Keying Material

KPP: Key Performance Parameters

LAN: Local Area Network

NEC: Navy Enlisted Classification

OSGR: On-Site Government Representative

PICO: Pre-Installation Checkout

PITCO: Pre-Installation Test and Checkout

RF: Radio Frequency

SOVT: System Operational Verification Test

SPEG: SOVT Preparation and Execution Guidance Document

SPIDER: SPAWAR and PEO Integrated Data Environment and Repository

TIA: Telecommunications Industry Association

UPS: Uninterruptible Power Supply