

Chapter 10 – Testing, Trials and Delivery

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References

- (a) OPNAVINST 4700.8K, Trials, Acceptance, Commissioning, Fitting Out, Shakedown and Post Shakedown Availabilities of USN Ships Undergoing Construction, Conversion and Modernization
- (b) NAVSEAINST 3960.5A, Policy on Ship Testing
- (c) NAVSEA INST 4700.11, Trials, Acceptance, Commissioning, Fitting Out, Shakedown and Post Shakedown Availabilities of USN Ships Undergoing Construction, Conversion and Modernization
- (d) NAVSEA S9095-AD-TRQ-010/TSTP, Total Ship Test Program Manual
- (e) NAVSEA 0924-062-0010, Rev C, SUBSAFE Requirements Manual
- (f) NAVSEA S9094-AE-GYD-010, Surface Ship Post-Delivery Test and Trials Guidance Manual
- (g) INSURVINST 4730.1 (series), Trials and Inspections of Surface Ships
- (h) INSURVINST 4730.2 (series), Trials and Material Inspections of Submarines
- (i) INSURVINST 4730.11 (series), Documentation of Deficiencies
- (j) MIL-STD 2106A, Development of Industrial Test Procedures
- (k) NAVSEAINST 5400.95F, Waterfront Engineering and Technical Authority Policy
- (l) COMFLTFORCOMINST 4790.3, Joint Fleet Maintenance Manual (JFMM)
- (m) OPNAVINST N9080.3G, Procedures for Tests and Trials of Naval Nuclear Powered Ships
- (n) OPNAVINST 4730.5R, Trials and Material Inspection on Ships Conducted by The Board of Inspection and Survey
- (o) OPNAVINST 4730.7F, Material Inspection of Submarines by the Board of Inspection and Survey
- (p) INSURVINST 4730.21 (series), AAW/DTE/SD DTE and Long Range Air Search Radar Performance Demonstrations
- (q) INSURVINST 4730.22 (series), Standards for Surface Ship Undersea Warfare (USW) Demonstration

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Figure 10-1: Major Notional Milestones During Construction/Conversion

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Chapter 10 – Testing, Trials and Delivery

10.1 Production Acceptance Testing During Construction, Conversion and Modernization

10.1.1 Introduction

Reference (a), [OPNAVINST 4700.8K](#), “Trials, Acceptance, Commissioning, Fitting Out, Shakedown and Post Shakedown Availabilities of USN Ships Undergoing Construction, Conversion and Modernization”, states that the goal of the Navy’s shipbuilding and modernization effort is to deliver ships to the Fleet that are capable of supporting the Navy’s mission and which are free from either contractor or government responsible deficiencies. To accomplish this, the Program Management Office and SUPSHIP team conduct observations of the contractors’ production processes, inspections, measurements, and testing, and assess objective quality evidence from the Contractor’s Quality Management Program to assure that the ship and its equipment and systems are ready for advanced phases of testing and trials. SUPSHIP and contractor personnel must closely coordinate their efforts when preparing for and managing the Test and Trials in accordance with the terms and conditions of the contract.

The Regional Maintenance Centers (RMC) assumed responsibility, within their geographic region, for all ship maintenance work contracted for accomplishment by commercial shipyards. Contract administration functions for modernization, repair and test and trials requirements shall conform to the provisions of the Joint Fleet Maintenance Manual (JFMM) Volume VII for those SUPSHIPS who retained repair responsibility for nuclear carriers and submarines.

10.1.2 Governing Documents

The requirements for testing and evaluation during the ship construction period are to be in accordance with the contract which should include the requirements outlined in the following documents:

- [NAVSEAINST 3960.5A**](#), “Policy on Ship Testing”, reference (b)
- [NAVSEAINST 4700.11](#), “Trials, Acceptance, Commissioning, Fitting Out, Shakedown and Post Shakedown Availabilities of USN Ships Undergoing Construction, Conversion and Modernization”, reference (c)
- NAVSEA S9095-AD-TRQ-010/TSTP, “Total Ship Test Program Manual”, reference (d)
- SUBSAFE Requirements Manual, NAVSEA 0924-062-0010, Rev C, reference (e)

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10.1.3 Purpose for Production Acceptance

The tests, trials, and evaluation requirements must prove that components are capable of supporting the design specifications and ship requirements when operating independently, when integrated into a system, and when operating interactively among multiple systems and interfaces. Validation of tests, demonstrations and evaluation of the ship's operating capability during trials provide objective quality evidence of the ship's true performance in attaining these required capabilities.

The stages of production acceptance testing are defined in paragraph [10.1.10](#). Results of "in process" production testing are reviewed to confirm that the installed equipments and systems support the readiness for trials. The "Test and Trials" phase has the goal of demonstrating that the ship is materially complete and can be presented to the Navy Board of Inspection and Survey (INSURV) for Acceptance Trials (AT) or Combined Trials (CT). [OPNAVINST 4700.8K](#) states that it is the responsibility of the President of INSURV to conduct trials as an independent verification of a ship's readiness for acceptance and delivery. Trials are also used to validate that the equipments and systems are operating satisfactorily during the guarantee period following AT and up to and including Final Contract Trials (FCT).

10.1.4 Administering the Test and Evaluation Program

SUPSHIPS' primary function within the Test and Evaluation (T&E) program is to administer the shipbuilding contract, approved ship specifications and Total Ship Test Program (TSTP) for each applicable program. The specific documents required by the TSTP that are to be produced by the contractor shall be used by SUPSHIP as a tool for monitoring technical progress during construction and for assessing the ship's readiness for INSURV Trials (Acceptance Trials, Underway Trials, Combined Trials and Super Trials). Ships shall not be considered ready for such trials unless the prerequisite tests are completed to the satisfaction of the SUPSHIP and the results of those tests support a high probability of successful trials as directed in [NAVSEAINST 3960.5A**](#).

Each SUPSHIP has established processes that are tailored to its specific construction programs. These command instructions are used in planning and conducting a total ship test program during new construction as appropriate for either surface ships or submarines. The individual ship's Comprehensive Test Plan should describe the Navy test organization and how it interfaces with the shipbuilder. It defines the stages of testing and publishes the format for test outlines and test procedures. NAVSEA S9094-AE-GYD-010, "Surface Ship Post-Delivery Test and Trials Guidance Manual," reference (f), provides further guidance on SUPSHIP roles and responsibilities after taking delivery of the ship from the contractor.

This administration of the requirements of the TSTP includes oversight of the contractor-provided Integrated Test Package (ITP) that requires:

- reviewing test documentation for contractual compliance, including test indices, test procedures/memorandums, test schedules, test reports;

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- monitoring the test schedule, witnessing test conduct, evaluating test results;
- advising the Program Test Director and SUPSHIP Project Officer/PMR of material problems; and,
- monitoring the delivery status of both government and contractor-furnished test documentation.

10.1.5 General Roles and Responsibilities

For ship construction programs and major conversions or modernizations performed by the private sector, [OPNAVINST 4700.8K](#) states that SUPSHIP is the responsible Supervising Authority designated to prepare, certify readiness and present the ship to INSURV in preparation for delivery.

10.1.5.1 Introduction

The SUPSHIP Project Management Team, in preparation for conducting the final stages of testing during planned trials, will ensure that the ship is ready for trials by:

- Observations and reviews during in-process production work
- Witnessing pre-determined check points and performing verification inspections as specified in the Contract Administration Quality Assurance Program (CAQAP)
- Managing the requirements of the Total Ship Test Program (TSTP)
- Confirming the contractor's and government's documentation for objective quality evidence that the ship or submarine is in compliance with the shipbuilding specifications
- Administration of the terms and conditions of the contract, and
- Validating the database of all deficiencies pertaining to the ship.

10.1.5.2 SUPSHIP Basic Functions for Tests, Trials and Evaluation Program

While the PM manages the TSTP, the contractor is responsible for the development of the Integrated Test Package (ITP), Comprehensive Test Plan (CTP) and Test Procedures (TP) related to Contractor-Furnished Equipment (CFE) and /or work performed by the contractor. The government is responsible for providing test procedures and trial requirements for Government-Furnished Equipment (GFE) to the contractor for integration into the ITP. The roles of the SUPSHIP as the Naval Supervising Activity (NSA) in the test, trials and evaluation program as outlined in the TSTP include the following:

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- a. The Supervisor and the Project Officer/PMR will designate a Local Total Ship Test Director (LTSTD). The LTSTD's duties, responsibilities and relationship with the PM Test Director are specified in the TSTP Manual and should be specified by the PM in the SPD or MOA when issued.
- b. The PM will also appoint a Local Combat Systems Test Director (LCSTD) and a Local Ship Systems Test Director (LSSTD). According to the TSTP Manual, the LCSTD must come from Naval Surface Warfare Center, Port Hueneme (NSWCPH), and the LSSTD must come from Naval Surface Warfare Center, Carderock Division (NSWCCD). The duties and responsibilities for both are specified in the TSTP Manual and should also be specified by the PM in the Ship Project Directive (SPD) or a Memorandum of Agreement (MOA) when issued.
- c. The Supervisor will chair the Test Task Group (TTG) established by the PM in accordance with the TSTP and as stated in Appendix C paragraph 4.e. The TTG established by the PM is separate and distinct from the contractually required Test and Trials Group/Joint Test Team established and typically chaired by the contractor. Some test team members will be on both groups. The TTG membership is a composition of contractor, subcontractor and government technical organization representatives and its size is based on the complexity of the contractual requirements and the Integrated Test Plan. Additionally, the SUBSAFE Requirements Manual details unique requirements for submarine new construction and major availabilities. The only positions specified by the SUBSAFE manual are the SSPD and deputy SSPD. There are no specific test positions specified by the SUBSAFE manual.
- d. The LTSTD and the Test Task Group work cooperatively to resolve testing issues identified by Test Problem Reporting and Resolution (TPRR) system and will be supported by a Combat Systems Test Development Director (CSTDD) and Ship System Test Development Director (SSTDD) or their local representatives when appointed by the PM.
- e. The SUPSHIP Project Management Team, in concert with the Test Team performing their contract administration responsibilities on the waterfront, is accountable for the administration and observation of the TSTP and associated stages of testing. The accountability includes reviewing the contractor's test documentation for contractual compliance including test indices, test procedures, test schedules, test reports; monitoring the test schedule; witnessing test conduct; evaluating test results; advising the Supervisor, Project Officer/PMR and PM of material problems; supporting the TTG in issue resolution, and monitoring the delivery status of both Government and contractor-furnished test documentation.
- f. The SUPSHIP/PM Test Team observes the contractor's test and evaluation program for Contractor-Furnished Equipment (CFE) as specified in [NAVSEAINST 3960.5A**](#).

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- g. SUPSHIP/PM Test Team personnel are responsible for administering the operation of the Government portion of the system supporting the contractor's Ships Construction Test Manual (SCTM) when required by contract. The SUPSHIP PM Test Team coordinates all government and contractor responsible preparations that must be considered in determining that the ship is ready for presentation to the Board of Inspection and Survey.
- h. The Project Officer/PMR will designate an INSURV coordinator as the point of contact for coordinating the actions of the contractor, government organizations and prospective ship's company during AT in accordance with INSURVINST 4730.1 (series), Trials and Inspections of Surface Ships or 4730.2 (series), Trials and Material Inspections of Submarines , references (g) and (h). This includes arranging for services outside of the contractor's area of responsibility in preparing for Trials and, in particular, services that require Navy assets to support the pre-underway and underway testing and trials phases.
- i. The SUPSHIP representatives on the Test Task Group and Project Management Team shall identify known non-compliant work to the Board of Inspection and Survey prior to their arrival for AT as directed by INSURVINST 4730.11 (series), Documentation of Deficiencies, reference (i).
- j. The Supervisor shall submit a report to NAVSEA 00, PEO and PM, IAW Appendix 10-A, certifying that the ship is ready for Acceptance Trials in accordance with [OPNAVINST 4700.8K](#). The Supervisor certifies to the Board of Inspection and Survey that the ship is ready for trials.
- k. The Project Management Team, consisting of SUPSHIP assigned personnel and any additional personnel provided via program funding, will carry out the actions and assigned responsibilities of the cognizant PM in accordance with the SPD or MOU and [NAVSEAINST 4700.11](#).
- l. When the Supervisor reports that the ship is ready for acceptance as stated in [NAVSEAINST 4700.11](#) and in accordance with the recommendations of INSURV and when approved by CNO, including any requested waivers, the agent acting for the Accepting Authority, COMNAVSEASYS COM, will accept the ship for the Navy and authorize the Supervisor to sign DD Form 250 and take delivery of the ship from the shipbuilder.

10.1.6 Integrated Test Package (ITP)

The Total Ship Test Program requires that the ship construction testing be accomplished in accordance with the contract through an orderly, validated Integrated Test Package (ITP) and through evaluation of test results during the construction of each ship. The ITP, as directed in [NAVSEAINST 3960.5A**](#), consists of a combination of Government and contractor (shipbuilder/subcontractor) prepared tests, tailored to the mix of Government and contractor design responsibilities of each shipbuilding contract. The testing requirements are

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developed during the design phases and they may be refined as construction proceeds. In general, the Government's portion of the ITP involves test documentation for Government-

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Furnished Material (GFM) while the contractor's involves Contractor-Furnished Equipment (CFE). Detailed requirements for the preparation, conduct, and maintenance of the ITP are prescribed in NAVSEA S9095-AD-TRQ-010, Total Ship Test Program Manual. The requirement to comply with the TSTP Manual should be invoked in the contract typically through the Shipbuilding Specifications (Sections 090 through 95 for most ships).

10.1.7 Shipbuilding Specifications

In general, the individual technical sections set forth the requirements for individual factory acceptance tests. Some test requirements may also be levied in the specific system specification section.

All other requirements for testing are usually contained in specification sections 090 through 095 of the specifications.

10.1.8 Test Documentation Booklet (TDB)

A Test Documentation Booklet (TDB) should be prepared during contract design to define the scope of the total ship testing program for both government and contractor provided equipment and systems. The TDB should supplement specification sections 092 to 095, may invoke use of the TDB, and after contract award, it provides the baseline from which the contractor develops the test program. The TDB typically consists of:

- a. **Test Index:** The test index provides a listing of each test procedure number and title. Typically, test procedure numbers may be cross-referenced with the test narratives of specification section 095.
- b. **Test Outlines:** Test outlines define the scope of testing to be accomplished on GFE. When test outlines are provided, the outlines serve as the basis for Government preparation of the respective test procedure. Test outlines may also be provided for interface between CFE and GFE or for CFE which is highly complicated or of special interest to the Government. Typically, section 092 of the shipbuilding specification defines the contractor's responsibility for use of test outlines.
- c. **Test Sequence Networks (TSNs):** The TSNs in the TDB are provided to the contractor as supplemental information that can be used in the bidding process. Following contract award, test sequence networks are provided by the contractor to establish the desired sequence of selected tests and the necessary prerequisite tests. These networks should be reflected in the contractor's test schedules. Typically, Specification Section 092 defines the extent to which TSNs are developed and used by the contractor.

10.1.9 Test Index

In accordance with the Contract Data Requirements List (CDRL), the contractor must submit a test index which provides a complete listing by test number and test title of all tests and certifications to be conducted during the Ship Test Program. This test index is derived from the government-developed TDB that is prepared prior to contract award and requirements defined in specification sections 090 to 095.

The test index reflects testing which is stratified into seven test stages as defined by Military Standard [MIL-STD-2106A](#), Appendix A, "Development of Industrial Test Procedures", reference (j). Although seven stages are defined, testing at each stage for each equipment and system is not always necessary. In some instances, an Engineering Process Agreement (EPA) may be executed between SUPSHIP and the Contractor for testing officially completed at land based test facilities. Official testing may be conducted at land based test facilities up to stage 3 testing. Stage three testing through stage five testing may be combined into one test procedure for certain systems. The combining will normally be in the contractor-developed test index. Stage 4 testing and above shall be conducted shipboard. Any deviation from the standard seven stage process shall first be approved by the Government. Further changes or combining of tests proposed by the contractor must be made and processed in accordance with the test requirements invoked in the contract. As outlined in the TSTP Manual, the test stages are:

- a. **Stage 1 - Material Receipt Inspection and Shop Tests:** Includes those tests and inspections that provide for inventory management and physical inspection of new material, equipment and systems, and associated documentation. These tests and inspections are intended to ensure receipt of equipment in good physical condition by the shipbuilder or other industrial organization. Stage 1 documentation is not normally in the form of a test procedure.

Stage 1 further includes those tests and inspections conducted prior to shipboard installation for new or repaired equipment or systems. In instances where equipment and systems are repaired aboard ship, shop test procedures may be used to validate readiness for shipboard testing. For work planning and cost accounting purposes, Stage 1 is not part of the test program and will normally be a part of the industrial organization's quality assurance program.

- b. **Stage 2 - Shipboard Installation Inspections and Tests:** These are conducted prior to operation of installed or relocated equipment, cabling, waveguide, piping, ventilation, etc., to ensure that each installation has been accomplished in accordance with established plans and specifications. The shipbuilder or industrial organization is normally responsible for preparation of Stage 2 test procedures.
- c. **Stage 3 - Equipment Tests:** Demonstrate that after shipboard installation, the individual equipment performs within established limits and tolerances. These equipment operability tests are conducted independent of the system (i.e., the

equipment may be isolated from the system) and can be conducted prior to complete system installation.

- d. **Stage 4 – Intrasystem Tests:** Demonstrate that equipment and required functions, entirely within one independent system, perform within established limits and tolerances. Stage 4 testing normally consists of intrasystem functions, signals, and commands within a single independent system of the combat system or ship system. Stage 4 includes all tests involving two or more items of equipment which do not involve more than one independent system of the combat system or ship system. Stage 4 tests may include tests between two or more items of equipment and between two groups of equipment within the same “stand alone” system.
- e. **Stage 5 - Intersystem Tests:** Involve testing the interfaces and interoperability between two or more independent systems within a combat system, ship system, or between the combat system and ship system. These tests demonstrate that two or more independent systems perform a specific function or functions within established standards. The exchange of intersystem signals, commands, functions and all associated computer interfaces are included.
- f. **Stage 6 - Special Tests:** Require special simulation facilities or resources external to the immediate test organization, but are conducted as part of the dockside work package for the industrial effort. Special tests can apply to one or more items of equipment, a single system, or a number of systems, and may require total ship operability. Stage 6 tests that can only be performed at-sea should be designated as Stage 7. Normally, there will be very few Stage 6 tests in an industrial test program.
- g. **Stage 7 - Trials Tests:** Must be conducted during sea trials (e.g., Builder's Trials (BT), Acceptance Trials (AT), Underway Trials (UT), Combined Trials (CT), Super Trials (ST), Post-Repair Trials (PRT) and Final Contract Trials (FCT)). Test procedures are not identified with a Stage 7 number unless the test can only be conducted entirely or partially at sea.

10.1.10 Test Schedule

In accordance with the CDRL, the contractor must prepare and submit a test schedule to SUPSHIP showing the dates when the tests are to be conducted. The rescheduling of individual tests because of changes in events or changes in material or other construction scheduling shall be submitted to SUPSHIP/PM Test Team as promptly as possible. To permit correction of defective work and to make necessary adjustments in sufficient time to allow completion before the trials, the installation tests of the various units should be conducted as soon as practical after installation. Also, ample time should be allowed between the tests and trials to correct defects found during the tests. Test schedules should be integrated into a Test Sequence Network (TSN).

The contractor's test schedule will be reviewed by the SUPSHIP/PM's Test Organization to ensure that the dates shown are realistic and valid on the basis of the time allowed for

conducting the tests and the availability of the items to be tested and to ensure the dates comply with the SPD when invoked. Questions concerning the schedule should be resolved through discussion with the contractor. The contractor should develop a test report for each test procedure as it is completed during the conduct of a test program. Each test report should have the same test number as the test procedure used for test performance. Test completion is defined as the date when the test procedure has been completed. Interim Test Problem Reports (TPR) are accepted by the Government and incorporated after resolution in the completed test procedure.

10.1.11 Test Organization

10.1.11.1 SUPSHIP Test Team

The SUPSHIP/PM Test Team composition varies depending on program maturity and contract requirements, the test program size, availability of personnel and tasking from the PM. In accordance with [NAVSEAINST 3960.5A**](#), the Test Team is headed by a SUPSHIP-appointed Local Total Ship Test Director (LTSTD) and is supported by a Local Combat Systems Test Director (LCSTD) and Local Ship Systems Test Director (LSSTD). They will team with the PM Test Director to accomplish the test program. There may be other supporting test staff depending upon the scope of the test program. In general, the SUPSHIP Test Team will administer all aspects of the waterfront test program. All personnel coming to the shipyard to perform test program work come under the control of the LTSTD even though they are not attached to the SUPSHIP.

10.1.11.2 Test Development Directors

For major ship programs, in accordance with [NAVSEAINST 3960.5A**](#), the PM may assign a Combat System Test Development Director (CSTDD) and a Ship System Test Development Director (SSTDD) to manage the development and integration of combat systems and ship systems tests and to assist the SUPSHIP in administering the test program. For surface ships, the Naval Surface Weapons Center Port Hueneme Division (NSWC-PHD) will be assigned as the CSTDD and the Naval Surface Weapons Center, Carderock Division (NSWCCD) as the SSTDD.

During each detail design period, the assigned CSTDD and SSTDD will develop test documentation for GFE and review the appropriate contractor-developed test documentation for CFE. Such reviews will be coordinated with the responsible NAVSEA technical organizations to ensure that previously developed test procedures are cost-effectively used to the maximum extent possible for Government responsible testing. For surface ship programs, the combat system test documentation repository is at NSWC-PHD and the ship systems test documentation repository is at NSWCCD.

The PM may task the CSTDD and SSTDD organizations to provide an on-site Local Combat System Test Development Director (LCSTDD) and Local Ship System Test Development Director (LSSTDD) to assist the SUPSHIP LTSTD in administering the ship test program.

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These personnel are under the administrative control of SUPSHIP but are not part of that organization. The LCSTDD and LSSTDD will be technically knowledgeable and will function to augment the expertise of SUPSHIP and the contractor, particularly for new systems, by resolving testing problems locally or by obtaining information quickly from the cognizant organizations. They will support the LTSTD in test documentation management including test document tracking and status; technical reviews of test requirements, test indices, test procedures, test reports, schedules; and test problem reporting and resolution. The LCSTDD and LSSTDD will provide the day-to-day liaison between the SUPSHIP Test Team and the external Navy test development community.

10.1.11.3 Test Task Group (TTG)

A Test Task Group (TTG) is established at the shipyard to assist in resolving problems uncovered during the industrial test program. A functioning TTG concept provides rapid communications among organizations involved and has proven beneficial in helping to smooth test operations during the construction period. TTGs are an important, proven tool used by the SUPSHIP LTSTD to get knowledgeable and responsible personnel together to resolve test problems, identify daily and weekly test schedules, discuss status and progress, etc. TTGs are used for both combat systems and ship systems, as well as for CFE and GFE. Meetings of the TTG are usually convened separately for combat systems and for ship systems because their agendas are seldom of common interest.

The composition of a TTG meeting will vary depending on the schedule of testing and the current test problems; however, the TTG will generally be chaired by the Supervisor as stated in the TSTP with representatives of the SUPSHIP Test Team, SUPSHIP technical codes, test development organization (when tasked by the PM), and (as appropriate) Navy field activities and equipment vendors. TTG membership should be composed of personnel with direct knowledge of equipment and system details and local conditions and be in a position to define problems with specificity and to act or to recommend action to resolve problems quickly.

10.1.11.4 Test and Evaluation Automated Management Information System (TEAMIS)

The Test and Evaluation Automated Management Information System (TEAMIS) is the NAVSEA database of test and evaluation information is contained behind the NMCI firewall. TEAMIS support for a given ship test program is tasked and funded by the PM to the CSTDD because the databases physically reside at NSWC-PHD. Both combat system and ship system test documentation information are contained in the TEAMIS data bases.

Information in the database is grouped into four major categories:

- Test Document Master File: Contains information on each document assigned an official test number, whether or not it is physically held in a NAVSEA repository.
- Ship Project Files: Contains data on individual ship test programs including test conduct status, test delivery status, test problem reporting, test change proposal, and

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engineering change proposal tracking. In addition there are capabilities for analyzing and generating output reports for test program management.

- Point of Contact File: Identifies cognizant individuals and organizations for each different ESWBS category. Names, addresses, telephone numbers, and other useful data about each individual and the scope of responsibility for a particular ESWBS category are included.
- Action Item File: A simple database which has mailing capabilities for support in managing the various aspects of a ship test program. The SHAPM TSTD or SUPSHIP LTSTD can assign action items to involved field organizations and mail these action items by way of the electronic mail system.

In addition to the main TEAMIS functions, there are small auxiliary database files that all valid users can access including an on-line data element dictionary and the electronic mail facility.

TEAMIS Ship Project Files are normally initiated by the CSTDD and SSTDD and maintained at the waterfront by the LCSTDD and LSSTDD from inputs provided by the test development and test management organizations. Subsequently, computer output reports are generated by the LCSTDD and LSSTDD to support the LTSTD and others.

TEAMIS does not contain Aegis Ticonderoga (CG 47) Class or Arleigh Burke (DDG 51) Class New Construction test and evaluation information. Information for the former ship classes may be available from Aegis Technical Representative, Moorestown, N.J., (856) 722-3619.

Test and evaluation information for Aegis Ticonderoga (CG 47) Class or Arleigh Burke (DDG 51) Class repair availabilities may be obtained from NSWC PHD, Air Dominance Department, Code A34, Port Hueneme, CA 93043, (805) 228-7594.

Access to the TEAMIS data bases may be arranged through the CSTDD at NSWC PHD, Air Dominance Department, Code A34, Port Hueneme, Ca 93043, (805) 228-7594, or the LCSTDD at the shipyard.

10.1.12 Test Procedures

10.1.12.1 Government-Furnished Test Procedures

Test procedures prepared by the Government are based on the test outlines contained in the Test Documentation Booklet. Actual preparation of Government responsible test procedures is accomplished through the test development organization based on requirements established and directed by the PM designated TSTD. To effect standardization, test procedure format and content will be in accordance with [MIL-STD-2106A](#), Appendix B. Where new equipment and systems are being developed and/or acquired for ships, the

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engineering process and documentation provided by [MIL-STD-2106A](#) should be invoked in contracts by the equipment/system acquisition manager.

Government-responsible test procedures are provided to the SUPSHIP LTSTD for delivery to the contractor by the CSTDD and SSTDD.

10.1.12.2 Contractor-Furnished Test Procedures

Test procedures prepared by the contractor are submitted to SUPSHIP and the test development organization in accordance with the CDRL. Review for format and content will be performed and comments/recommendations or approval provided through the LTSTD to the contractor. Standard test procedure format and content should be in accordance with [MIL-STD-2106A](#), which is typically identified in the ship specification package section 092.

10.1.13 Test Witnessing

A test program objective is to have 100 percent of final tests witnessed by SUPSHIP or authorized Government representatives, as specified in the TSTP, paragraph 2.8.c. Each test must be conducted in the presence of such witnesses except where the SUPSHIP/PM Test Team has authorized the contractor to proceed with conducting and certifying the results of the test. No test should be started without prior notification to the SUPSHIP/PM Test Team of date and time. Notification must be provided sufficiently in advance to allow for test witness planning. Specific requirements for test notification should typically be included in specification section 092.

10.1.14 Test Reports

In accordance with the CDRL, the contractor must prepare and submit test reports and supporting data for each test procedure conducted. Test reports document the test results and findings in relation to technical specification requirements. Test reports include the test procedure with completed and signed data recording sheets, test equipment sheets, comment sheets, all data recordings which can be manually analyzed, plus the results of analysis of the raw data records taken at time of test. Generally, the signing of any data sheet by a Government test witness signifies only that the test was conducted in accordance with the approved test procedure and that test data was accurately recorded. Test data requiring technical review and acceptance by the Government shall be submitted to SUPSHIP as soon as practical upon completion of each test procedure. Unless otherwise stipulated in the contract, the contractor will usually retain the originals of all test data and make it available to SUPSHIP/PM Test Team upon request or post on the virtual office environment.

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10.1.15 Test Problem Reporting and Resolution System

10.1.15.1 Test Change Proposal (TCP)

The Test Change Proposal (TCP) is used to make changes to approved test documentation prior to actual test conduct. Test documentation changes proposed as a result of test conduct are processed and controlled through the test problem reporting and resolution system. The use of a TCP is typically provided for by Section 092 of the ship specification. The TCP is generally used to correct errors in test documentation, primarily test procedures, caused by design changes or equipment changes. A TCP is not considered to be a problem report.

10.1.15.2 Test Problem Report (TPR)

A Test Problem Report (TPR) is used to document discrepancies and problems in test documentation, equipment, or performance encountered while using specified test procedures during test conduct. A TPR is written when the test procedure cannot be performed as written. The TPR supports the problem reporting and corrective action process required by the TSTP. The use of a TPR is typically provided by section 092 of the ship specification and usually requires resolution in less than 48 hours to prevent delay and disruption. A TPR is usually handled and resolved by the Local Total Ship Test Director (LTSTD) and the LCSTDD or LSSTDD. When local resolution is not possible, the LCSTDD or LSSTDD will request technical expert assistance from the external test development organization.

10.1.15.3 Establishment and Control

An integral part of the conduct of the ship construction test program is the procedure for identification and timely resolution of problems identified during shipyard testing. When required by contract, the Ship Construction Test Manual (SCTM) requires that a shipyard test problem reporting and resolution system be established for each ship program. Such a system must be defined in the ship specification and invoked in the contract. The SUPSHIP is responsible for administering the operation of the Government portion of the system supporting the SCTM. The SUPSHIP will make every effort to resolve problems locally using the TTG and engineering services provided on-site by the PM. When formal assistance is required from external organizations, SUPSHIP will refer the problem to the engineering organizations identified by the PM designated TSTD. The test problem report form of Appendix F to the SCTM is usually used for this referral. SUPSHIP will assign response time for referred problems based on the severity and impact of the problem.

10.1.15.4 Engineering Organizations

The Program Manager is responsible for tasking Participating Managers (PARMs), other government organizations and NAVSEA 05 for any requirements that are up to and above those stipulated in [NAVSEAINST 5400.95F**](#), Waterfront Engineering and Technical

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Authority Policy, reference (k), via the SPD or another official document, to provide engineering support, points of contact, and individuals with the authority to certify technical accuracy of proposed resolutions. The Program Manager will provide this information to the SUPSHIP in support of the TSTP. Refer to Chapter 8 of this manual for policy on Field Engineering and Waterfront Technical Authority.

10.1.15.5 Documentation Changes

The Program Manager appointed CSTDD and SSTDD work jointly with the SUPSHIP/PM Test Team and LTSTD to establish procedures to ensure that any corrections made to test documentation during the conduct of the test program are provided to the responsible test documentation development organization. This activity is normally accomplished by the LCSTDD and LSSTDD. In this way, such corrections can be incorporated into the test documentation for subsequent ships of the class and other ship programs with the same equipment and systems.

10.1.15.6 Multi-Shipyard Programs

Test problem reporting and resolution is especially critical for multi-shipyard construction test programs, since problems may affect more than one yard and the best resolution for one yard may not be the optimal outcome for another. Tracking and maintaining the status of test problems must be current and accurate. The PM will establish an integrated test problem tracking and status system to provide SUPSHIPS with current information. The SUPSHIP and the Test Team at each shipyard are tasked to provide the inputs required to maintain currency.

10.2 Application of TSTP to Post Shakedown Availability (PSA) and Major Repair Work

10.2.1 Introduction

The requirements for performing production acceptance testing is defined in [NAVSEAINST 3960.5A**](#). The NSA will ensure that test program management and testing is accomplished in accordance with the Total Ship Test Program Manual when applicable, or as outlined in the [COMFLTFORCOMINST 4790.3](#), the Joint Fleet Maintenance Manual (JFMM), reference (I). NAVSEA 0924-062-0010, Rev C, SUBSAFE Requirements Manual, is also applicable for major submarine availabilities. The objective in applying the Total Ship Test Program principles in a major industrial availability is to provide a test program that will effectively and efficiently assure that the work performed by all organizations was properly completed and to assess the ship's readiness to perform its mission at the completion of the industrial period when it is redelivered to the Fleet. The technical and inspection requirements to be met by the contractor are detailed in the work item specifications. Normally, both the work specification and the NAVSEA Standard Items (or other requirements) referenced in the work item must be used to determine the complete technical requirements, check points and other testing to be satisfied by the contractor. Should a private industrial activity be

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designated by contract to perform the function as the Lead Maintenance Activity (LMA), as defined in the JFMM, it is the LMA's responsibility to schedule, integrate and track all test and test results, including those of outside activities as specified in Specification Sections 092–095.

10.2.2 Ship System Testing (HM&E)

The Immediate Superior-In-Command (ISIC) will determine the requirement for Light-Off Assessments (LOAs), using the guidance in the JFMM, for ships undergoing a PSA or other types of depot level availabilities. The following Recurring Work Items (RWIs) have been established to provide guidance for obtaining the necessary contractor support and preparations for complex and non-complex LOAs. NSA will incorporate the following, as applicable, in the contract.

- NAVSEA SI 009-43 LOA “Support for Steam Propulsion System”;
- NAVSEA SI 009-44-LOA “Support for Gas Turbine Propulsion System”;
- NAVSEA SI 009-66 LOA “Support for Diesel Propulsion System”; and,
- NAVSEA SWI 092-02 “Pre-LOA Assistance for Contractor Support”.

A Fleet Engineering Mobile Assessment Team may visit to conduct inspections onboard the ship prior to the LOA so that systems or equipment that require corrective maintenance can be identified and written into the work package.

10.2.3 Combat System Testing

Current NAVSEA guidance has established the following criteria:

- a. For short availabilities, normally less than 120 days, Stage 3 (equipment tests) and Stage 4 (intrasystem tests) of the TSTP will be scheduled only for equipment and systems modified, overhauled, or repaired. Selected additional Stage 4 and Stage 5 through Stage 7 testing will be specified in the ITP to check interfaces disconnected or changed during the availability. Except for testing associated with SHIPALTs or ORDALTs, testing requirements for shorter availabilities is a TYCOM decision.
- b. For longer availabilities, testing requirements will increase proportionally with the length and complexity of the combat system work. ROH and COH require Stage 3 testing of all equipment and Stage 4 intra-system and Stage 5 through Stage 7 testing of all systems to demonstrate overall combat system operability readiness. Lower level testing of equipment modified, overhauled, or repaired will be accomplished by the activity screened to perform the work item. The industrial activity should accomplish the higher level intersystem testing (Stage 5 and above). In cases where work is performed within the system by an organization other than the industrial activity (e.g., Ship's Force or Alteration Installation Team (AIT)), the activity which performed work within the system

shall support the industrial activity in the accomplishment of the higher level testing (Stage 5 and above).

These requirements are invoked in the specifications by appropriate work items based on the NAVSEA standard work item 844-series. Work Item 844-series tasks the contractor to develop a test plan, generate test sequence networks, arrange for temporary services to support testing, and manage the testing to ensure an orderly and timely completion.

10.3 Trials and Delivery

10.3.1 Policy

The Navy's primary mission, established by Public Law and reiterated in the U.S. Navy Regulations, is to conduct prompt and sustained combat operations at sea. The tasks of conducting trials and inspections of Navy ships have been established to assist the Navy in meeting its mission responsibility.

The policies and procedures that must be followed are in [OPNAVINST 4700.8K](#) and [NAVSEAINST 4700.11](#). The policies of CNO on ship trials and delivery are as follows:

- a. Ships and submarines will be fully mission-capable with all contractual and Governmental responsibilities resolved at delivery, except for crew certification (surface ships), outfitting, or special Navy range requirements which cannot be met until after delivery.
- b. The Deputy CNO (Resources, Warfare Requirements & Assessment) makes the final determination of readiness for service.
- c. Independent verification of readiness of surface ships and submarines for acceptance and recommendation for Fleet introduction is the responsibility of the Board of Inspection and Survey (INSURV).

10.3.2 General

Before Navy acceptance of a ship, the contractor is required to conduct a series of operating and performance trials at sea. Pre-sea trial requirements, such as dock trials, fast cruise, pre-trial audit, and combat system trial rehearsal, are required by the specifications for some ship types, particularly submarines and nuclear-powered surface ships. Section 094 of the Ship Specifications delineates the requirements for ship trials. The specific tests to be conducted during trials are contained in Section 095. Figure 10-1 contains an example of notional trials milestones for a typical new construction, conversion, or modernization ship and illustrates the sequence of trials and related events.

Trials at sea include the BTs, that are witnessed by SUPSHIP/PM (and INSURV for nuclear ship's propulsion plant) and other Navy personnel; and ATs, that are witnessed by INSURV (for other than propulsion on nuclear-powered ships) and other Government personnel. The

primary purpose of BT is to demonstrate that the ship is, or will be, ready for AT. The conduct and content of the BT will, as a minimum, be the same as that intended for AT. When BT has been successfully completed, the ship, with INSURV aboard, is taken to sea for AT with satisfactory completion as a condition of the Navy's acceptance of the ship.

Terminology and content of these trials may vary in the larger shipbuilding programs; for example, AT might be used in place of BT, or BT in place of combat system trials. Specific requirements will be contained in the contract specifications. In certain programs the contract specifies that a "combined" or "super trial" be conducted that incorporates all trials up to and including AT.

Nuclear-powered ships are placed "In Service" about two weeks before start of the first sea trial. Fitting out is performed at the building yard before delivery. Before operations at sea, the ship and crew must undergo a Pre-Critical Reactor Safeguard Examination and Fast Cruise. A nuclear-powered ship is normally placed "In Commission Special" or "Commission" within several weeks of delivery. The SUPSHIP is responsible for recommending dates to COMNAVSEA for placing the ship In Service; In Commission Special; or In Commission as applicable. Nuclear-powered ships undergoing overhaul, conversion, or nuclear refueling normally remain In Commission with a crew assigned. For nuclear-powered ships, following U.S. Navy Crew Certification, BT tests requiring full power can be performed.

Ship acquisition contracts contain a Delivery of Completed Vessels clause. Under this clause, the contractor is prohibited from tendering the vessel for delivery until satisfactory completion of AT. This clause also delineates the condition of the vessel at the time of delivery. AT cannot be held without SUPSHIP concurrence that the vessel is ready for the trials.

Detailed trial requirements for a specific ship or class are found in Section 094 of the Ship Specifications. Basic guidance to SUPSHIP for conduct of trials and delivery of nuclear-powered ships is provided by [OPNAVINST N9080.3G](#), reference (m) (issue applicable to the contract). SUPSHIP should prepare an internal instruction delineating organizational responsibilities and relationships with the Program Manager.

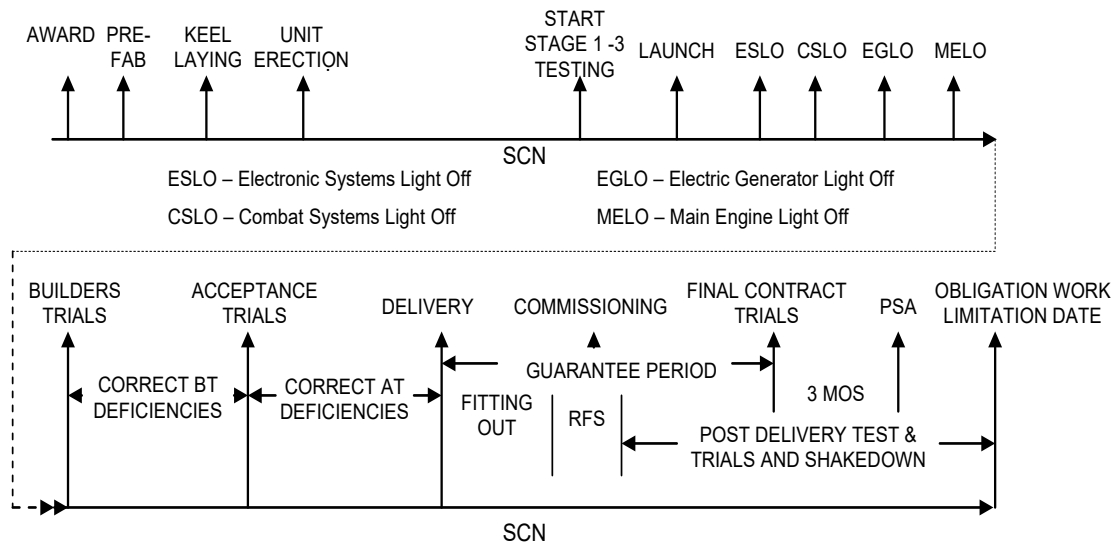


Figure 10-1: Major Notional Milestones During Construction/Conversion (Conventional propulsion)

Trials are also conducted for boats and other small craft. These trials, performed under the cognizance of a SUPSHIP, are usually not witnessed by INSURV but by a trial board. The trial board is selected by SUPSHIP at the direction of INSURV, and with the concurrence of the PM. Boats and craft require full USCG equipment during trials.

10.3.3 Trials and Delivery of Ships

10.3.3.1 Builder's Dock Trials (BDT), Trial Rehearsal, and Fast Cruise

Nuclear-powered ship's propulsion plant is operated by certified Navy personnel vice contractor personnel for conventional propulsion plants. Navy crew will operate the nuclear propulsion plant during all phases of testing and trials. Builder's Dock Trials (BDT) consist of tests conducted to determine the ability of the ship from a material standpoint to safely conduct sea trials. BDT is conducted during a 24-hour period sufficiently in advance of sea trials to correct deficiencies which would prevent the ship from safely conducting sea trials. Operational tests of machinery, equipment, and systems that have not been previously tested will be operated during sea trials.

Combat System Trial Rehearsal is a dry run of the tests and operations of the combat system that will be required during sea trials. In particular, all required navigational equipment shall be tested. The trial rehearsal should be conducted with personnel who will operate the equipment at sea. The purpose of the trial rehearsal is to validate allowed time and sequencing for the tests and to avoid surprises during sea trials. Pre-trial audit consists of operability demonstrations for a Project Management team immediately before AT.

Nuclear ships and submarines are placed "in service" prior to conduct of the Fast Cruise that is a period during which the ship is made available for dockside training for contractor personnel and/or a Navy crew immediately before initial sea trials. The fast cruise period is typically unhampered by industrial work. No trials, tests, inspections, examinations, or work should be scheduled by the builder, Supervising Authority, or forces afloat during the fast cruise. Since successful completion of fast cruise normally will be followed within a day by commencement of sea trials, it is important to ensure the ship is ready for sea when fast cruise commences.

Before BDT or other operations of the propeller or intake, the site is to be inspected by both the contractor and SUPSHIP to ensure that no conditions exist that could damage the vessel during the trials or operations, such as shallow water and debris in the water which could damage the propellers or foul the intakes.

10.3.3.2 Builder's Trials (BT)

At sea testing is phase two of Builder's Trials (BT) and is in accordance with the trial requirements (normally section 094) of the ship specifications. BT is required to demonstrate that the ship is seaworthy and that the equipment and systems are operational and ready for AT. BT is necessary for the proper demonstration of electronics installations, such as air search radar, fire control tracking, search and listening sonar, and similar equipment that require a land-free area and deep water in which to operate. In short, all tests and demonstrations that cannot be performed dockside are accomplished during BT.

The BT may be combined with AT, where such action is authorized. In such cases, all tests, except those requiring sea conditions, must be completed before or during the dockside test program (Stage 2 through 6).

In accordance with the CDRL requirements, the contractor must give SUPSHIP advance notice of BT and provide a trial agenda and schedule of events indicating tests the contractor plans to conduct. SUPSHIP is responsible for providing copies of applicable BT/AT test memoranda and procedures to INSURV one month before BT.

Before starting BT, all conditions required by Section 094 (or equivalent trial section) of the ship specifications will have been met. Every reasonable effort must be exerted to meet all conditions. If unusual circumstances preclude such timely accomplishment, the SUPSHIP and contractor agree, and COMNAVSEA approves proceeding with BT without one or more of the conditions having been met fully (all safety item conditions must be met fully), the trials may proceed if the facts are documented and a system is established to ensure timely resolution of the waived item(s).

SUPSHIP is responsible for ensuring that the contractor carries out all contractual requirements of the trials. Although one BT is generally sufficient for surface ships, other trials may be necessary to satisfy SUPSHIP that the ship is ready for AT.

The contractor is responsible for supplying a competent trial crew to operate the ship during BT, except for submarines and nuclear-powered ships, including a licensed master for the

waters to be navigated and a qualified chief engineer for the horsepower and tonnage of the ship. For ships other than submarines and nuclear-powered ships, the contractor is responsible for providing a qualified radio operator and obtaining necessary frequency authorization from the Federal Communications Commission (FCC) for use of commercial ship-to-shore and ship-to-ship channels during trials. If Navy channels are used, approval must be obtained from CNO or NAVSEA and a qualified Navy operator must supervise the use. In the absence of such authority, or if no qualified Navy operator is available, the contractor's crew must include a licensed commercial operator and must operate on the frequencies assigned by the FCC.

SUPSHIP should review and approve the list of personnel not employed by the contractor (i.e., subcontractor representatives or vendors) whom the contractor desires to have onboard at the time of trials. For nuclear-powered ships, this review is performed by SUPSHIP and NAVSEA. Before the trials, SUPSHIP should furnish the contractor with a list of all Government personnel who will be onboard the ship as observers. Subject to the limits of available berthing and messing facilities, SUPSHIP representatives attend the trials to witness the operation of all equipment and to observe the recording of the required data. The Pre-commissioning Commanding Officer (PCO) of conventional-powered ships and certain key personnel also attend to become acquainted with the operating details of electronic, weapons, and machinery installations.

During BT, a simulated INSURV inspection will be conducted in accordance with the guidelines of INSURVINST 4730.1F for surface ships and INSURVINST.2F for submarines. The contractor will function as the presenting authority and SUPSHIP/PM Test Team will function as INSURV. Electronic Trial Cards will be utilized to document known non-compliant discrepancies, including items identified in outstanding Quality Deficiency Reports/Corrective Action Reports. Deficiencies disclosed during all trials will be documented on Electronic Trial Cards and the status maintained in the management data base. After completion of BT, SUPSHIP will notify COMNAVSEA and INSURV of the results of the trials and of any deficiencies (including operational equipment not onboard) that cannot be corrected in time for AT. The SUPSHIP report certifying the ship is ready for AT will generally be in accordance with SOM Appendix 10-A.

10.3.3.3 Acceptance Trials (AT)

This section discusses the SUPSHIP responsibilities on conduct of Acceptance Trials (AT) in general terms, detailed requirements are set forth in:

- [OPNAVINST 4730.5R](#), "Trials and Material Inspection on Ships Conducted by The Board of Inspection and Survey", reference (n)
- [OPNAVINST 4730.7F](#), "Material Inspection of Submarines by the Board of Inspection and Survey", reference (o)
- INSURVINST 4730.1 (series), "Trials and Inspections of Surface Ships", reference (g)

- INSURVINST 4730.2 (series), “Trials and Material Inspections of Submarines”, reference (h)
- INSURVINST 4730.11 (series), “Documentation of Deficiencies”, reference (i)
- INSURVINST 4730.21 (series), “AAW/DTE/SD DTE and Long Range Air Search Radar Performance Demonstrations”, reference (p)
- INSURVINST 4730.22 (series), “Standards for Surface Ship Undersea Warfare (USW) Demonstration”, reference (q)

The AT requirements should be detailed in section 094 (or equivalent trial section) of the shipbuilding specifications.

The Board of Inspection and Survey (INSURV) is responsible for witnessing the AT. The purpose of the trial is to determine whether the ship has been completed in accordance with the contract specifications and is operationally ready. The AT is also an opportunity to verify that the product:

- conforms to the design and manufacturing requirements of the contract
- is free from all defects in materials and workmanship
- will conform to the performance requirements of the contract
- will meet the mission requirements as outlined in the Operational Requirements Document/Capability Development Document (CDD) from OPNAV

Depending on the trial results, the INSURV board either recommends acceptance of the ship or requires additional trials at a later date when specific deficiencies have been corrected. The board's recommendation to accept delivery may be conditioned upon completion of certain work items before the delivery. In this event, the Accepting Authority must be assured that these items are completed before acceptance takes place. Generally, when a return inspection is impractical or unnecessary, the board delegates responsibility to the SUPSHIP for determining that work is completed and reporting this to the accepting authority.

Under the Delivery of Completed Vessel clause, the contractor must satisfy three requirements before the acceptance trials, as follows:

- a. Correction of all contractor-responsible defects discovered before completion of BT unless otherwise agreed to by the Administrative Contracting Officer (ACO);
- b. Correction of all contractor-responsible defects discovered after BT that will adversely affect the operational capability of the vessel as defined in the clause; and
- c. Certification to and concurrence of SUPSHIP that the vessel is ready for AT.

The contractor must notify INSURV via the SUPSHIP of the proposed date for AT in accordance with the CDRL. The SUPSHIP should forward the contractor's letter with the SUPSHIP endorsement only when the SUPSHIP concurs that the vessel is ready or can reasonably be expected to be ready for the trials. The letter and endorsement are directed to the President of INSURV with a copy to NAVSEA. [OPNAVINST 4700.8K](#) requires SUPSHIP to recommend trial dates to the President of INSURV and to keep the President informed of any necessary changes. Any deficiencies in the material readiness of the ship to join the Fleet must be noted by SUPSHIP in the endorsement of the contractor's letter. Subsequently, the SUPSHIP should maintain liaison with INSURV and progress the ship to ensure that the SUPSHIP still concurs with the contractor's certification that the vessel is ready for AT.

Depending on CDRL requirements, the contractor must provide a trial agenda approximately 60 days before the trial. The agenda outlines the tests and demonstrations to conduct and contains a chronological schedule of events, including all Stage 7 (at sea) tests. The SUPSHIP reviews the agenda and schedule to determine whether successful completion of the proposed tests will demonstrate that the ship fulfills the contract requirements and whether the proposed schedule is feasible and free of conflicts. At least 30 days before the trials, SUPSHIP forwards all documentation required by various INSURV instructions, including a Trial Agenda, to INSURV. The agenda represents only a fundamental set of demonstrations. Additional tests and demonstrations will be requested by INSURV inspectors, if necessary, to pinpoint deficiencies when unsatisfactory or marginal performance is observed.

When INSURV arrives for AT, SUPSHIP will provide the attending recorder with the certificates and other information required by INSURVINST 4730.1F (surface ships) or INSURVINST 4730.2F (submarines). The certificates are prepared by the contractor and approved by SUPSHIP. SUPSHIP approval may be based on review of the contractor's quality control system and records, as well as on direct observation by Government inspectors. SUPSHIP will present the following certificate to INSURV:

In construction/activation of (SHIP NAME) the contract plans and specifications, circular of requirements, activation requirements and authorized changes thereto have been satisfactorily fulfilled, except as noted below (summarized by Departments; if none, so state).

All known deficiencies at the time of arrival of the INSURV Board Members will have been recorded on Electronic Trial Cards and are presented to the respective Board Members. The Board Members will verify the existing deficiencies. All emergent or observed discrepancies during attendance at the trials will be recorded utilizing the format of the Electronic Trial Card and will be input into the management database of trial deficiencies.

10.3.3.4 INSURV Deficiency Criteria

INSURV uses standards set forth in such documents as the installation drawings, electronics installation and maintenance books, technical manuals, Planned Maintenance System (PMS)/Resource Management System (RMS) requirements, and general arrangement

drawings to evaluate the completeness of a ship for acceptance and measure a ship's readiness to carry out assigned mission requirements in accordance with the CPD or ROC/POE specified by CNO and the ship building specifications. INSURV uses standard Navy references and procedures typically employed throughout the system. The following criteria for identifying and classifying deficiencies are used:

- a. In general, deficiencies are items which require corrective action to bring the material condition or system performance of the ship into compliance with the required standards. These include:
 - Failure of equipment to meet performance or safety requirements;
 - Requirements for excessive maintenance resources;
 - Incomplete or unsatisfactorily completed installations, equipment, equipage, repair parts, publications, or plans;
 - Incomplete or unsatisfactorily completed inspections, certifications, or tests;
 - Conditions in violation of current environmental pollution standards;
 - Deficiencies still outstanding from previous INSURV trials;
 - Deficiencies which require corrective action by maintenance activities other than the contractor or the subcontractor(s); and
 - Deficiencies in Planned Maintenance, such as missing, incomplete, or inaccurate MRCs, or inadequate support due to lack of test equipment, tools, lubricants, or special materials required to perform PMS.
- b. Deficiency forms will be prepared in the Electronic Trial Card format or in accordance with INSURVINST 4730.11J. Deficiency forms on minor items (for example, painting and broken vent handles) are not desired in accordance with Chapter 9, Contract Administration Quality Assurance Program. Furthermore, only items outstanding at the time of the inspection should be included.
- c. A deficiency may exist at the outset or may occur as the result of a casualty during the course of a trial. Either case will be documented as a deficiency. If a deficiency is corrected during a trial, the deficiency will be documented as a deficiency and annotated as (corrected).
- d. Arrangements for personnel to attend AT should be the same as those made for BT. The number of observers should be limited to avoid interference with the ship's operating personnel and with the functions of INSURV.
- e. Suitable accommodations, including adequate space to conduct conferences during the trials, should be provided for the INSURV board members. Gear, equipment, and other

items required by the board are described in INSURVINST 4730.1F and INSURVINST 4730.2F.

- f. The contractor must provide a qualified organization with sufficient technical, operating (for non-nuclear-powered ships), and data-taking personnel to demonstrate that equipment and machinery meets performance specifications. Data-taking responsibilities involve:
- Observation and collection of data and preparation of test reports;
 - Preparation of all trial forms;
 - Establishment of a trial board room with ample personnel for recording and computing data (not applicable for submarines);
 - Provision of a means for expeditious posting of current results; and
 - Preparation and publication of complete trial data.
- g. For installed systems and equipment, the contractor must provide:
- A single coordinator for demonstrations;
 - Sufficient qualified technical personnel to ensure satisfactory performance of equipment; and
 - Sufficient qualified personnel to operate and demonstrate the capability of the equipment to meet performance specifications.

10.3.3.5 Ship Systems and Equipment Demonstrations

SUPSHIP will review the qualifications of the contractor's proposed trial crew to demonstrate equipment capabilities, giving particular attention to the qualifications of radar, sonar, and target tracking operators; ship-to-military aircraft communications personnel; and communication supervisors and operators if U.S. Navy communication facilities are to be used during the trials. When techniques peculiar to the military are involved and SUPSHIP considers requiring the contractor to furnish qualified crew members to be unreasonable, SUPSHIP will arrange for Navy personnel to assist the contractor in demonstrating the operational capabilities of the particular equipment.

SUPSHIP is responsible for arranging and scheduling the services of naval aircraft and ships necessary in testing radar and other shipboard equipment during trials as prescribed by INSURVINST 4730.1F and INSURVINST 4730.2F. In making these arrangements, the aircraft organization should be informed in detail on what the exercises will consist of and how and when the exercises will be conducted. SUPSHIP is also responsible for arranging and scheduling shore station support for exterior communications tests.

SUPSHIP should ensure that various items of trial equipment, electronic test equipment, instruments, or other apparatus required by the contract are installed in the ship before trials. In addition, the condition of the ship must meet the requirements of the trial section (usually section 094 of the ship specifications) of the ship specifications. After the trials, the necessary precautions should be taken to prevent damage to any trial equipment belonging to the Government; such equipment should be removed and carefully packed and shipped by the contractor in accordance with the contract terms.

AT includes comprehensive operating tests, Stage 7 defined by section 092 of the ship specifications, as well as material inspections to determine the ship conforms with the contract requirements. INSURVINST 4730.1F and INSURVINST 4730.2F outline the many tests and demonstrations required; the board may prescribe other tests and demonstrations as circumstances warrant. The board also may request that copies of purchase specifications for specific items of equipment be made available for verification of specification requirements. Use of the contractor's files on return to port will normally suffice.

SUPSHIP is responsible for coordinating the actions of the contractor and prospective ship's company during AT, as illustrated below:

- a. The contractor's representatives and the inspectors from SUPSHIP office should check the draft of the vessel to verify that trial displacement is in accordance with contract requirements. The adequacy, operation, and cleanliness of the lubricating oil installation should be examined. All main propulsion equipment, main gear, and shaft bearings should be inspected for abnormal temperatures and the smoothness of operation should be observed, checking any noise and vibration. All valves should be tested for ease of handling and proper operation. The location of ladders, gratings, and other compartment and access arrangements should be checked to ensure that these arrangements permit satisfactory operation of and accessibility to the machinery installation and equipment. Inspection should be made for steam, water, and oil leaks.
- b. After completing AT, all steam connections should be checked to ensure these are thoroughly drained.
- c. Within 30 days of completion, SUPSHIP should submit to NAVSEA a copy of the recorded information on submarine hydraulic systems tests obtained during the dock trials and sea trials.
- d. Disassembly of machinery to permit post-trial examinations will be as specified by INSURV. Before the board leaves the ship upon return from sea, SUPSHIP should obtain a letter covering the post-trial examination or an advance copy of the list of machinery installations to be opened for the post-trial examination from the INSURV board. The PCO's representative should be present as the various pieces of machinery are opened. Before delivery of the ship, the contractor should clean the machinery and systems required by the contract.
- e. SUPSHIP is responsible for developing and classifying items of remaining work identified on the Electronic Trial Cards for presentation to INSURV on arrival for the trials, in

accordance with INSURVINST's 4730.1F, 4730.2F, and 4730.11J. SUPSHIP classification of work items is a preliminary classification only. Final identification of all deficiencies is the function of INSURV as outlined in INSURVINST 4730.11J. The board's action is formally set forth in the board's trial report subsequently submitted to the President of INSURV, CNO, NAVSEA, and other interested Navy activities.

- f. The NAVSEA representatives, PM and SUPSHIP's personnel work together to review the board's final deficiency list and provide advance authorization to correct the deficient items as appropriate before delivery. SUPSHIP's Trial Coordinator prepares a formal list of the trial deficiencies that includes the board's classification and numbering system and the action prescribed by the NAVSEA representative and distributes the list to the INSURV board, PM and NAVSEA Codes. The INSURV board incorporates the SUPSHIP list by reference and prepares the formal report/"quick look report". NAVSEA issues a final action letter that changes, adds to, or confirms the preliminary action indicated on the SUPSHIP list. After reviewing the formal list of trial deficiencies, the contractor provides to the SUPSHIP a list of contractor-responsible items to which the contractor takes exception. SUPSHIP then forwards the contractor's comments with recommendations to NAVSEA for resolution.
- g. All items classified by INSURV as single starred items must be accomplished before delivery of the vessel, unless a waiver is granted by CNO or the board amends the classification.
- h. Double starred deficiencies are applicable only to ships constructed, converted, or modernized with a separate fitting-out period assigned away from the building site. Double starred deficiencies must be corrected before the ship is moved from the building site, unless a waiver is granted by CNO or the board amends the classification.

10.3.3.6 Completion of Work

SUPSHIP is responsible for ensuring that the required work is satisfactorily accomplished. At the time of delivery, the contractor must submit written comments on all items remaining on the work list; these comments should appear in the delivery letter. The contractor's comments may be in the following form, as appropriate:

Contractor will forward to the ship as soon as received.

Contractor is unable to complete at his shipyard before delivery of the ship and requests that the work be done by the fitting out yard and treated as a change under the contract.

Contractor does not consider this item to be part of the specifications of the contract.

The delivery letter should also contain similar comments by SUPSHIP concerning items for which the Government is responsible.

10.3.3.7 Delivery of Completed Vessels

When the contract contains the Delivery of Completed Vessels clause, the contractor cannot tender the ship for delivery until all contractor-responsible deficiencies discovered before or after completion of the acceptance trial that will adversely affect the operational capability of the vessel, as defined in the clause, are satisfactorily corrected. The clause also requires that the contractor and the ACO agree on the manner of correcting outstanding contractor-responsible defects remaining after delivery of the vessel. If agreement is not reached, the defects may be corrected as directed by the ACO. Acceptance of delivery of the vessel is recommended by INSURV, and this recommendation is sent to COMNAVSEA (the accepting authority), SUPSHIP, and other interested Navy activities. The accepting authority responsibilities assigned to COMNAVSEA will typically be carried out by agents acting for the Commander, [NAVSEAINST 4700.11](#). Normally, the Supervisor will sign the DD 250. The accepting authority is designated by CNO to accept delivery on behalf of the Government. Ship contracts can require delivery to be made at a Naval Ship Yard (NSY) or, for nuclear-powered ships, at the contractor's plant.

After completion of the work required by INSURV, SUPSHIP notifies NAVSEA by letter that the ship is ready for delivery. SUPSHIP also prepares a letter to the contractor instructing the contractor to deliver the ship; however, this letter is not forwarded until NAVSEA so directs. NAVSEA, as required by [NAVSEAINST 4700.11](#), will request the TYCOM to conduct the pre-commissioning habitability inspection required by [OPNAVINST 4700.8K](#).

For surface ships not fitted out in the building yard, SUPSHIP will:

- a. Obtain from the contractor the itinerary and schedule for the transit of the vessel to the delivery point, and provide the schedule to CNO (N-8) and appropriate Fleet Commanders.
- b. Ensure that the contractor has obtained the necessary clearances required to enter and clear any port planned to be visited enroute to the delivery point.

10.3.3.7.1 Delivery Letter

A delivery letter, RCS NAVSEA 9000-1, is prepared by SUPSHIP and addressed to the accepting authority, COMNAVSEA, with copies to the PCO, the outfitting activity, the Type Commander (TYCOM), the Defense Finance and Accounting Service (DFAS), and the applicable Financial Information Processing Center (FIPC) (DFAS and FIPC need only receive the cover letter without enclosures). The delivery letter will supply the following information:

- a. The authority for delivery of the ship;
- b. The proposed date and place of delivery;
- c. A statement that the ship was constructed in accordance with the contract specifications, subject to any special conditions explained in the letter or its enclosures; and

- d. Other pertinent comments, such as the rights of the Government under the "Guarantee" clause of the contract and the need for prompt information on the occurrence of guarantee defects.
- e. The following information will also be included as enclosures to the delivery letter:
- (1) A list of incomplete or unsatisfactory work at the time of delivery for which the contractor is responsible;
 - (2) A list of incomplete or unsatisfactory work at the time of delivery for which the Government is responsible;
 - (3) A statement on the status of changes at the time of delivery;
 - (4) A list of the INSURV work items completed before delivery; and
 - (5) A list of the INSURV work items not completed before delivery.

10.3.3.7.2 Documenting Deficiencies in Ship's CSMP

Automated Ships Maintenance Action Forms (OPNAV Form 4790/2K) should be prepared and submitted as enclosures to the PCO letter that identifies each INSURV work item, as a remaining deficiency, at the time of delivery. The following data element blocks on the OPNAV Form 4790/2K should be completed:

BLOCK NAME	BLOCK NO.	DATA FIELD
Ship's UIC	1	5
Ship's Name	A	Unlimited
Hull Number	B	Unlimited
Equipment Noun Name	5	16
INSURV Number	19	14
	20	14
	21	14
	22	14
	23	14
	24	14
Remarks/Description	35	1200/300 per form/ Max. of four forms

All other data elements on the OPNAV Form 4790/2K will be left blank for completion by Ship's Force, as applicable, and entry into the Ship's Maintenance and Material Management (3-M) System for construction of the ship's baseline Current Ship Maintenance Project (CSMP) file.

Twenty-four hours before a ship's departure from the builder's yard, SUPSHIP will advise COMNAVSEA of the proposed movements of the ship. SUPSHIP will advise CNO and NAVSEA by naval message immediately of departure of the ship.

The representative of SUPSHIP, the PCO, and the contractor should report at the delivery point to the agent for the accepting authority (COMNAVSEA). The normal agent for the accepting authority is SUPSHIP. The Supervisor will sign the receipt (DD Form 250) for the ship. A copy of the receipt will be provided to the PCO.

10.3.3.7.3 Water, Fuel, and Lubricating Oil Soundings

For surface ships, soundings of water, fuel, and lubricating oil tanks should be taken and checked by representatives of SUPSHIP, the PCO of the ship, and the contractor for purposes of determining the fluids left onboard at the time of delivery. Depending on contract language, the results of these sounding will result in either a bill to the contractor for the deficit amount of each commodity that is not provided in full by contract requirement or a bill to the government for the amount remaining onboard. Contract requirements are the determining factor in establishing a course of action. Upon commissioning, the ship becomes part of the active Fleet, and no reimbursement from Fleet accounts for fuel remaining onboard is required. The fuel remaining onboard is considered part of the investment cost of ship procurement in accordance with the [DoD FMR Volume 2A](#), article 010201.

Lubricants left onboard may be of two varieties and will be handled as follows:

- a. Bulk lube oil left onboard follows the same general guidelines as above, and can be included as part of the contract requirements. If not included as part of the contract, the contractor will be reimbursed for the bulk lube oil left onboard, chargeable to the ship's outfitting allotment established with SCN funds.
- b. Contractors will be advised to off-load packaged lube oil before delivery of the ship to the Navy. In no instance will reimbursement be made to the contractor for packaged lube oil left onboard ship at time of delivery.

10.3.3.7.4 Pre-Commissioning Habitability Inspection

The timeframe relative to delivery for placing a ship in service or in commission varies with ship type (i.e., surface, submarine or nuclear-powered) and is defined in [OPNAVINST 4700.8K](#). In all cases, a pre-commissioning habitability inspection is a prerequisite to placing the ship in service or in commission and a pre-commissioning habitability inspection required by [OPNAVINST 4700.8K](#) is conducted by the TYCOM. The purpose of this inspection is to ascertain whether or not the crew living and messing spaces are clean, safe, and ready to receive the crew; the purpose is not to conduct a detailed review of compliance with technical requirements such as performed by INSURV during AT. Pre-commissioning habitability inspection deficiencies must be corrected or resolved by action of SUPSHIP before commissioning or placing the ship in service (active or special). SUPSHIP will review the inspection deficiencies to determine action required, responsibility, and cost; it will forward recommendations for each deficiency to NAVSEA.

10.3.3.7.5 Acceptance and Placing Ship in Service

When SUPSHIP has been authorized to accept delivery of a ship and to commission or place the ship in service special, the procedures described above should be followed as closely as possible. In addition:

- a. COMNAVSEA will be requested to issue movement orders for the ship;
- b. SUPSHIP will arrange to have the ship commissioned or placed in service immediately following acceptance;
- c. The acceptance and commissioning or placing in service of a ship will be reported immediately to NAVPERS, INSURV, and NAVSEA;
- d. SUPSHIP will obtain a receipt for the ship and the material aboard and issue a receipt to the contractor or develop a memorandum of understanding, if necessary, to describe the responsibilities of each party when responsibility cannot be totally transferred;
- e. The PCO will be informed of the need to arrange for official representation funds from the cognizant Commanding Officer, Naval Base (COMNAVBASE);
- f. The contract provisions specify the requirements for delivery of the vessel when under its own power or under tow. When the vessel is under its own power, the size and qualifications of the crew are specified, as well as requirements for renewal of oil filters, purification or replacement of lubricating oil, and non-operation of the vessel during foul weather. If the vessel is under tow, the contract requirements specify a towing crew, condition of the vessel, and prohibitions against the vessel being part of a multiple tow.

Conventional-powered ships built or converted at private shipyards are placed in commission at the direction of CNO soon after delivery; fitting out is generally accomplished at the contractors facilities. An assigned readiness-for-sea period is provided so the PCO/CO can prepare the ship for sea without outside interferences. At the end of the readiness-for-sea period, the ship reports to the cognizant Fleet Commander for shakedown and preparation for final contract trials. The shakedown period is primarily intended for training and for operations at sea, including any tests and trials not previously conducted. During shakedown, tactical data are obtained; and standardization trials, structural test firings of newly installed armament, and other operations are also conducted. As a result, shakedown frequently reveals unsatisfactory items and deficiencies not previously detected.

10.3.3.8 Delivery of Ships and Craft for non-USN Contracts

At the time of delivery, SUPSHIP will furnish the following information for each craft delivered to the Army and the Air Force:

- a. Items to be included in the delivery letter:
 - (1) Authority for delivery of the ship or craft;
 - (2) Proposed date and place of delivery;

- (3) A statement that the ship or craft was constructed in accordance with the contract, including a list of the contract number and the numbers of all contract modifications applicable; applicable specifications and all amendments; contract and working drawings; the latest alterations applicable; INSURV work items completed before delivery; and INSURV work items not completed before delivery; and
 - (4) A statement that all United States Coast Guard (USCG), American Bureau of Shipping (ABS), U.S. Public Health Service certificates, and the ship's inventory and allowance lists (for Navy type ships) have been prepared and distributed as required by the contractual documents.
- b. Items to be included in the appendix to the delivery letter:
- (1) A list of incomplete or unsatisfactory work at the time of delivery for which the contractor is responsible;
 - (2) A list of incomplete or unsatisfactory work at the time of delivery for which the Government is responsible (explicit information will be provided on the action taken by SUPSHIP to correct such deficiencies);
 - (3) If a shortage list is not prepared, a list of allowance items not onboard for which the contractor is responsible (explicit information will be furnished on the action taken by the contractor to supply the missing material); and
 - (4) If a shortage list is not prepared, a list of allowance items not onboard for which the Government is responsible (explicit information will be furnished on the action taken by SUPSHIP to correct such deficiencies).
- c. Distribution of copies of the delivery letter will be made as follows:
- (1) Original to consignee
 - (2) Two copies to the cognizant Navy office(s)
 - (3) Additional copies as designated in the contract

10.3.3.9 Trials and Delivery of Ships under Maritime Administration (MARAD) Contracts

The MARAD maintains and activates ships for the Government under contracts administered by MARAD representatives. Trials are conducted for these ships under the joint supervision of the MARAD Trial Board and INSURV in the same manner as Navy-conducted trials. When assigned by NAVSEA as the Navy liaison officer with MARAD, the SUPSHIP must prepare and submit work lists to INSURV for further presentation to the MARAD Trial Board.

On successful completion of the trials and after consideration of MARAD inspectors' lists of uncompleted work, MARAD informs INSURV whether MARAD intends to accept the ship and the proposed date of delivery. The requirements for acceptance of the ship are that:

- The ship satisfies the contract requirements and has successfully passed the required trials, tests, and inspections;
- When the Navy and MARAD have agreed that certain Navy work items will be accomplished during the building or conversion period, such work has been accomplished; and
- Specific current MARAD requirements, such as drydocking and provision of repair parts, have been fulfilled.

On certification from MARAD that the requirements have been fulfilled, the senior member of INSURV authorizes acceptance of delivery of the ship. Delivery and acceptance take place in a manner similar to the delivery and acceptance under Navy contracts.

10.3.3.10 Trials and Delivery of Ships Bought for Foreign Military Sales (FMS)

The trials and delivery of ships built for foreign Governments will generally follow procedures used for USN ships. Specifics for each case must be tailored to the requirements of the recipient country and the terms of the FMS case as represented in the contract.

10.3.4 Trials and Delivery of Boats and Other Craft

10.3.4.1 Trials and Final Inspection

Trials and final inspection are required for most boats and craft. This includes BT/AT. The conduct of these trials and the final inspection, though not necessarily observed by INSURV, must conform to the same high standards established by the board.

Before the trials begin, the CDRL and the craft specifications generally require the contractor to submit a trial agenda and a schedule of events showing the operations and tests the contractor proposed to conduct in order to demonstrate compliance with the contract. SUPSHIP reviews the agenda and may add or delete requirements, as appropriate. Other procedures followed by SUPSHIP are similar to those used by INSURV in the trials of ships. For example, INSURV procedures for the classification of work items are normally followed with single starring of items to indicate work that must be accomplished before delivery.

10.3.4.2 Boats and Craft Procured Under Navy Appropriations

For boats procured under a Navy appropriation, ATs are conducted on the first boat of a type produced under the contract. These trials are witnessed by a trial board appointed by SUPSHIP. After completion, SUPSHIP submits a trial report for action by NAVSEA to review the report and promptly advise SUPSHIP of NAVSEA's action on the work items list, indicating whether the action is applicable to all subsequent boats under the contract. As necessary, SUPSHIP issues field changes (within SUPSHIP approval limits) covering contractor-responsible items that are not to be corrected by the contractor before delivery and any Government-responsible work that the contractor is to perform.

Trials of subsequent boats of the same type under the contract are conducted by SUPSHIP trial board or by regularly assigned SUPSHIP inspection personnel, as SUPSHIP may determine. Reports on these trials need not be submitted to NAVSEA for action; however, any new work items included in the reports will be submitted to NAVSEA by letter if SUPSHIP considers that the items are not the contractor's responsibility. On the other hand, work items that differ from those on the first boat under the contract and that are clearly the contractor's responsibility do not require NAVSEA action.

10.3.4.3 Boats and Craft Procured for Other Agencies

Unless otherwise directed by NAVSEA, trials must be conducted for each boat and craft procured for other agencies for which SUPSHIP is ACO; these trials must be witnessed by a SUPSHIP-appointed trial board. The following procedures apply to trial board reports:

- a. Within two working days after completion, SUPSHIP will forward a preliminary report of the trials to NAVSEA, the PM and customer (as applicable).
- b. Within two working days after receipt of the report, NAVSEA will take preliminary trial authorization action. This action will be addressed to SUPSHIP with a copy sent to the other agency or other requiring activity, as appropriate.
- c. Promptly after submission of the preliminary trial report, SUPSHIP will forward a complete report of the trials to the other agency or other requiring activity via NAVSEA.
- d. On receiving the complete trial report, NAVSEA will endorse the report to the consignee, pointing out specific major deficiencies and indicating final NAVSEA authorization. A copy of NAVSEA endorsement will be forwarded to SUPSHIP. Where major deficiencies occur, NAVSEA will also submit recommendations for correcting those deficiencies.

10.3.4.4 Delivery

On satisfactory completion of the work items that must be completed before delivery, SUPSHIP directs the contractor, by letter, to ship or deliver the boat or craft according to the terms of the contract. At the time of delivery, the contractor should list and comment on all uncompleted work items for which the contractor is responsible, stating the reasons for non-completion or requesting that the work items be completed by the Government at the contractor's expense. At the same time, the contractor must submit a completed DD Form 250. SUPSHIP prepares and forwards a delivery letter to the receiving activity with a copy to NAVSEA.

APPENDIX 10-A: Procedures for the Supervising Authority's Certification of Certification of Readiness for Acceptance Trials

1. Upon completion of Builder's Trials (BT) and no less than 10 working days prior to Acceptance Trials (AT), the Supervising Authority will submit a message report to COMNAVSEASYSKOM stating that the vessel is certified ready in all respects for the scheduled AT. This report will address the following items:
 - (a) Describe Compartment Completion:
 - Tanks and Voids - () of () closed - out and accepted;
 - Habitable/accessible Spaces - () of () closed - out and accepted.
 - Include a description as to the completeness of ship control and propulsion spaces.
 - (b) Verify that the prerequisite Stage 3, 4, 5, and 6 tests of the Integrated Test Package have been successfully completed and that it is expected that shipboard systems will perform successfully during AT.
 - (c) Identify the percentage of supply load-out/fitting-out and indicate any significant shortfall.
 - (d) Verify the BTs have been successfully completed and significant construction deficiencies have been corrected.
 - (e) Verify that the applicable system and subsystem certification requirements have been accomplished.
 - (f) Identify other deficiencies not addressed above which may have a detrimental impact on the conduct of AT.
2. If in the judgment of the Program Manager, the deficiencies identified in the certification message seriously jeopardize the success of AT, the Program Manager will delay the trial until the deficiencies are corrected. In this case, a recertification of readiness by the Supervising Authority is required.

Appendix 10-B: Acronyms

ABS	American Bureau of Shipping
ACO	Administrative Contracting Officer
AIT	Alteration Installation Team
AT	Acceptance Trials
BDT	Builder's Dock Trials
BT	Builder's Trials
CAQAP	Contract Administration Quality Assurance Program
CDD	Capability Development Document
CDRL	Contract Data Requirements List
CFM	Contractor Furnished Material
CNO	Chief of Naval Operations
CO	Commanding Officer
COH	Complex Overhaul
COMFLTFORCOMINST	Commander, Fleet Forces Command Instruction
COMNAVBASE	Commanding Officer, Naval Base
COMAVSEASYSKOM	Commander, Naval Sea Systems Command
CPD	Capabilities Production Document
CFE	Contractor Furnished Equipment
CSMP	Class Standard Maintenance Plan
CSMP	Current Ship Maintenance Project
CSTDD	Combat Systems Test Development Director
CT	Combined Trials

CTP	Comprehensive Test Plan
DFAS	Defense Finance and Accounting Service
DoD	Department of Defense
DoD-STD	Department of Defense Standard
EPA	Engineering Process Agreement
ESWBS	Expanded Ship Work Breakdown Structure
FCC	Federal Communications Commission
FCT	Final Contract Trials
FIPC	Financial Information Processing Center
FMS	Foreign Military Sales
GFM	Government Furnished Material
HM&E	Hull, Mechanical and Electric
IAW	In accordance with
INSURV	Board of Inspection and Survey
INSURVINST	Board of Inspection and Survey Instruction
ISIC	Immediate Superior in Command
ITP	Integrated Test Package
JFMM	Joint Fleet Maintenance Manual
LCSTD	Local Combat Systems Test Director
LMA	Local Maintenance Activity
LOA	Light Off Assessment
LSSTD	Local Ship Systems Test Director
LTSTD	Local Total Ship Test Director
MARAD	Maritime Administration
MOA	Memorandum of Agreement

MRC	Maintenance Requirement Card
NAVPERS	Navy Personnel Command
NAVSEA	Naval Sea Systems Command
NAVSEAINST	Naval Sea Systems Command Instruction
NMCI	Navy/ Marine Corps Intranet
NSA	Naval Supervising Activity
NSWCCD	Naval Surface Weapons Center Carderock Division
NSWC-PHD	Naval Surface Weapons Center-Port Hueneme Division
NSY	Naval Ship Yard
OPNAVINST	Chief of Naval Operations Instruction
PARM	Participating Manager
PCO	Pre-Commissioning Commanding Officer
PEO	Program Executive Office
PM	Program Manager
PMR	Program Manager's Representative
PMS	Preventive Maintenance System
PMS/RMS	Planned Maintenance System/Resource Management System
PRT	Post Repair Trials
PSA	Post Shakedown Availability
RMC	Regional Maintenance Center
ROC/POE	Required Operational Capability/Projected Operational Environment
ROH	Regular Overhaul
RWI	Recurring Work Items
SC,N	Ship Construction, Navy

SCTM	Ship Construction Test Manual
SHAPM	Ship Acquisition Program Manager
SPD	Ship Project Directive
SSTDD	Ship Systems Test Development Director
ST	Super Trials
SUBSAFE	Submarine Safety Certification Program
SUPSHIP	Supervisor of Shipbuilding, Conversion and Repair, USN
T&E	Test and Evaluation
TCP	Test Change Proposal
TDB	Test Documentation Booklet
TEAMIS	Test and Evaluation Automated Management Information System
TP	Test Procedures
TPR	Test Problem Report
TPRR	Test Problem Reporting and Resolution
TSN	Test Sequence Network
TSTP	Total Ship Test Program
TTG	Test Task Group
TYCOM	Type Commander
USCG	United States Coast Guard
USN	United States Navy
USW	Under Sea Warfare
UT	Underway Trials