



DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND
WASHINGTON DC 20362 5101

IN REPLY REFER TO
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NAVSEA INSTRUCTION 9094.5

From: Commander, Naval Sea Systems Command
To: All Offices Reporting Directly to COMNAVSEA

Subj: SHIP PERFORMANCE TRIALS

Ref: (a) NAVSEA 0900-LP-095-3010, "Ship Post-Delivery Test and Trials Guidance Manual"

1. Purpose. To establish policy on ship performance trials (e.g., hydrodynamic performance, machinery performance and hull and propulsion plant vibration trials).
2. Scope. The requirements of this instruction shall apply to all classes of surface ships and submarines. This instruction is not applicable to boats and craft.
3. Definition. Performance trials are trials conducted on a ship which is representative of a new ship class or a significantly different follow-on ship of a class for acquiring overall ship performance data applicable to that class, e.g., standardization, tactical, etc. "Significantly different" is defined as changes to the hull/machinery plant that cannot be adequately predicted using existing performance data. These trials are normally conducted during the ship's post delivery shakedown period.
4. Background.
 - a. The Navy has historically supported a general policy of obtaining operational data from one ship of each class to provide necessary information to the Fleet. This data was obtained during a set of trials grouped under the loose designation of performance and special trials. The responsibility for obtaining the data originally rested with the Board of Inspection and Survey. The Naval Sea Systems Command (NAVSEA) gradually assumed the responsibility for obtaining the data. Since 1953, the Propulsion Systems Analysis Division, NAVSEA 56X1 (originally the Performance and Scientific Section of the Bureau of Ships), has requested, coordinated, and disseminated the results of these trials. The trials have generally been conducted and reported by the David W. Taylor Naval Ship Research and Development Center although other organizations have conducted and reported some specific trials.

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b. There is no other instruction requiring that the subject trials be conducted. However, the General Specifications-for Ships of the United States Navy, Section 094, contain the requirements for these trials which are conducted by and at the expense of the Government. In addition, reference (a) includes performance trials which include "common test events frequently required during the post-delivery phase of surface ship acquisition, modernization and conversion programs."

c. Decisions regarding the conduct of performance and special trials have been left to the individual Ship Acquisition Program Managers (SHAPMs) or Ship Logistics Managers (SLMs). The performance trials have not always been conducted on a ship of a new class because a ship or funds or both were not available. Lack of a definite policy regarding performance trials has also contributed to this problem.

5. Application of Trials Results. The data from performance trials will be used to define the ship class operating capabilities and limitations. Secondly, the data allows the naval planner and the ship designer to assess the accuracy of the design performance predictions and design procedures. This assessment is a vital link in the feedback system that provides for improvements in subsequent ship designs. This data will also be used as a point of departure for future ship designs and to refine design assumptions.

6. Categories of Performance Trials. Performance trials can be categorized as those trials common to virtually all new ship classes. These trials are:

a. Hydrodynamic Performance which includes:

(1) Standardization (e.g., calm water propulsion at two displacements). This also includes a correlation model test(s) designed to reflect the ship's condition during standardization.

(2) Acceleration and Deceleration.

(3) Tactical and maneuvering.

(4) Seakeeping and seaworthiness (e.g. ship motions, rough water propulsion, tests of stabilizer effectiveness, etc.).

(5) Stability and control.

b. Machinery Performance (e.g., locked shaft, trailed shaft, transient torque and thrust, crashback, and fuel economy).

c. Hull and Propulsion Plant Vibration.

7. Policy. Performance trials will be conducted on one ship of a new ship class (or significantly different follow-on ship of a class) to provide the complete performance information required by the ship's operators as well as the naval planners and ship designers. The performance trials outlined in paragraph 6 shall be regarded as a minimum. Model testing to determine a resistance correlation allowance shall also be conducted as a part of the standardized trials. (See paragraph 6a(1).)

8. Action.

a. Ship Acquisition Program Managers (SHAPMs) or Ship Logistic Managers (SLMs) in the course of planning for the performance trials for a new class shall:

(1) Obtain from the Propulsion Systems Analysis Division (SEA 56X1) the performance trials requirements for that new ship class, the trial agenda, the recommended activities to conduct the trial and detailed preliminary budget estimates which will identify those areas which have not been budgeted, such as shipyard support for installation and removal of equipment.

(2) Ensure that for every new ship class or for every significant follow-on ship of a class acquired under its charter, timely and thorough planning for performance trials is done and that adequate funding is budgeted and allocated for such trials. For significantly different follow-on ships of a class, such as modified repeats, the Propulsion System Analysis Division (SEA 56X1) will coordinate with SHAPMs, SLMs, and other NAVSEA technical codes to determine which performance trials are required.

b. The Propulsion Systems Analysis Division (SEA 56X1) shall serve as the coordinator for performance trials within NAVSEA. Planning, execution and analysis of each specific trial will be the responsibility of the cognizant NAVSEA technical code.

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