



**DEPARTMENT OF THE NAVY**  
OFFICE OF THE CHIEF OF NAVAL OPERATIONS  
2000 NAVY PENTAGON  
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

OPNAVINST 4850.1B  
N411  
20 FEB 2001

**OPNAV INSTRUCTION 4850.1B**

From: Chief of Naval Operations

Subj: NAVAL CONVENTIONAL ORDNANCE MAINTENANCE AND QUALITY  
EVALUATION POLICY

Ref: (a) OPNAVINST 8011.9A  
(b) SECNAVINST 5000.2B  
(c) SECNAVINST 5400.15A  
(d) OPNAVINST 8010.13C

1. Purpose. To establish Naval conventional ordnance maintenance and quality evaluation (QE) policy. This is an updated instruction that has been expanded in scope and should be reviewed in its entirety.

2. Cancellation. OPNAVINST 4850.1A.

3. Scope. This instruction pertains to all categories of Naval conventional ordnance, including sonobuoys and Marine Corps Class V (A) aviation ordnance. This instruction applies to Naval commands responsible for preparing Program Objective Memorandum (POM) and budget submissions for ordnance maintenance and quality evaluation.

4. Objectives.

a. Provide policy for programming, budgeting and execution of maintenance and QE programs for Naval conventional ordnance.

b. Provide policy for collection and dissemination of QE data that will provide a mechanism for overall evaluation of the ordnance stockpile health including performance, reliability, safety, and availability.

c. Provide policy for the assessment of ordnance maintenance and QE programs.

d. Assign responsibilities and actions.

5. Background.

a. The Non Nuclear Ordnance Requirements (NNOR) document, defined by reference (a), prescribes the Navy's requirement for conventional ordnance. The NNOR model determines the

total munitions requirement based on many input factors and can be run in a variety of modes. The standard (unconstrained) run reflects the full requirement for meeting Defense Planning Guidance scenarios and is the basis for ordnance procurement programs. A constrained run provides requirements based on current inventory. As such, constrained requirements provide a better near term maintenance requirement for some legacy weapons. Those items not normally included in the NNOR such as gun ammunition have requirements based on allowances, usage, and attrition. Further, since the model makes certain assumptions about the amount of material in the maintenance pipeline, the budgeting and programming for maintenance must also account for these assumptions. Maintenance programs are a critical logistics element of the total life cycle incorporating both preventive and corrective maintenance elements to ensure the conventional ordnance stockpile is kept in the highest state of readiness.

b. Naval conventional ordnance degrades due to age and/or exposure to environmental stressors, manifesting in changes to safety, reliability, and/or performance characteristics. These changes must be predicted, detected, identified, and mitigated to prevent unacceptable risk involving safety and/or mission performance. Degradation in the safety, reliability, and/or performance of conventional ordnance can result in the following:

(1) Limitations in the useful in-service time, i.e., shelf life, service life, installed time, or service use.

(2) Inadvertent explosive incidents, failures, or mishaps.

(3) Significant reprogramming efforts to investigate and resolve those major incidents, failures, or mishaps.

(4) Performance failures of mechanical and electro-mechanical devices and systems (e.g., guidance and control systems).

(5) Additional or increased procurement or maintenance requirements resulting from unanticipated or predicted reductions in safety, reliability, or performance.

c. Quality evaluation enhances the ability to analyze and predict the safety, reliability, and performance of conventional ordnance/munitions using scientific data and trend analysis. Timely identification of potential deficiencies provides flexibility to make decisions needed to effectively manage the conventional ordnance inventory and acquisition plans.

d. Reference (b) and (c) assign Program Managers (PMs) responsibility for total life cycle management of conventional ordnance under their cognizance. This responsibility includes the complete range of management actions for planning and execution of Naval conventional ordnance maintenance and QE. Historically, Naval Air Systems Command

(NAVAIRSYSCOM), Naval Sea Systems Command (NAVSEASYSYSCOM), and their affiliated Program Executive Offices (PEO) and PMs have managed separate programs. The policy within this instruction allows for continued program management by systems commands (SYSCOMS) provided these programs ensure consistent data is produced and maximum synergy and sharing of data is achieved.

6. Policy.

a. Activities responsible for preparing POM/Budget and baseline assessment submissions for rework of naval conventional ordnance shall program for maintenance of total projected unserviceable inventory as reported in Conventional Ammunition Integrated Management System (CAIMS) or its successor systems: CAIMS Open System Environment (OSE) and the Ordnance Information System (OIS). This shall not exceed the total requirement published in standard NNOR or the constrained NNOR **whichever is the greater**. Those items not normally included in the NNOR such as gun ammunition shall have maintenance requirements based on a documented baseline such as shipfill, combat consumption, training pipeline, or component attrition/failure.

b. The programmed maintenance requirement shall be consistent with engineered maintenance interval expirations and aviation ordnance captive carry policy.

c. Maintenance will not be funded for ordnance with ready-for-issue inventory in excess of NNOR levels or other documented baseline requirements for non-NNOR items. Unfunded maintenance requirements will be carried forward and phased into out year workload planning/budgeting.

d. Some ordnance items are removed from the NNOR and replaced with improved or advanced variants. Requirements for newer variants normally cannot be met by initial production. In this event, maintenance of legacy ordnance items shall be funded to meet constrained requirements as preferred ordnance inventories ramp up to meet requirements.

e. PMs with weapons that are covered by manufacturer's warranty that have no repair capability organic to the Navy must POM/budget for the out-of-warranty costs for maintenance by the manufacturer.

f. A QE program shall be implemented for the test, surveillance, and prediction of the effects of aging and environmental exposure on all in-service Naval conventional ordnance.

g. QE shall be used as a major factor in determining maintenance requirements for conventional ordnance with **no engineering or service life limitations**.

h. QE shall be used to evaluate the safety, reliability and performance characteristics of all in-service Naval conventional ordnance. The QE effort will provide support to the PMs throughout conventional ordnance life cycle, or until the conventional ordnance is removed from service. Additionally, the QE program will:

(1) Determine the current condition of the inventory through test, evaluation, or engineering assessment of the safety, reliability and performance characteristics.

(2) Identify trends in those characteristics, predict the future condition of the stockpile, and predict expected service or useful life and/or maintenance interval in terms of safety, reliability, or performance.

(3) Identify causative factors that affect the health of the stockpile or item in the stockpile-to-target sequence including those originating from design, assembly, maintenance, handling, storage, deployment and interfaces with weapons and combat systems.

(4) Provide technically and statistically based evaluations for the PMs to effect stockpile management decisions.

i. Maintenance and QE programs will be assessed no less than annually. The following data elements will be available for review:

(1) Maintenance and QE funding.

(2) Date of last QE test by ordnance item.

(3) Ordnance QE metrics that reflect performance degradation, safety risks, accelerated aging or changes to predicted shelf life.

j. The Quality Evaluation Technologies and Equipment (QETE) development and acquisition program is endorsed for the consolidated development of new QE technologies and economical development, procurement and maintenance of common QE test equipment. PMs shall utilize the QETE to the maximum extent possible.

## 7. Summary of Actions and Responsibilities.

a. The Deputy Chief of Naval Operations (Fleet Readiness and Logistics) (N4) is responsible for assessing the PM/PEO/SYSCOM maintenance and QE programs to ensure optimization of resources and compliance with this instruction. N4 shall designate the Ordnance Programs and policy Branch, (N411), to:

(1) Ensure that maintenance and QE programs are established and maintained for all in-service conventional ordnance under the resource sponsorship of CNO (N7).

(2) Perform maintenance and QE assessments.

(3) Establish and chair semi-annual QE reviews consisting of resource sponsors, the SYSCOMs, the Naval Ordnance Safety and Security Activity (NOSSA), and associated PEO/PMs to assess QE planning and execution between SYSCOMs and affiliated PMs.

b. The DCNO Warfare Requirements and Programs CNO (N7) is assigned the resource management responsibility to ensure adequate resources are provided for:

(1) PEO/PM/SYSCOM maintenance and QE programs.

(2) Navy Quality Evaluation Technologies and Equipment (QETE) Program.

c. SYSCOMs, and associated PEO/PMs, will establish a management structure for the execution of the Maintenance and QE program, maximizing to the greatest extent possible support from the other SYSCOMs by:

(1) Conserving resources through mutual support efforts with other SYSCOM PMs.

(2) Requiring the conventional ordnance/munitions program managers perform the budget and execution functions to effectively execute their individual maintenance and QE program plans.

(3) Coordinating and promulgating instructions, policies, procedures, and plans to implement this policy.

(4) Ensuring each SYSCOM/PEO/PM is represented at the semi-annual QE review chaired by CNO (N411).

(5) Providing maintenance rework and delivery schedules to Naval Ammunition Logistics Center (NAVAMMOLOGCEN) to effect optimum pre-positioning for the maintenance pipeline retrograde and optimal positioning actions.

(6) Providing depot maintenance assignments to NAVAMMOLOGCEN for each repairable ordnance item.

d. Naval Sea Systems Command, via the NOSSA, as the Department of the Navy is technical authority for explosive safety and explosive materiel shall

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(1) Assist the PMs by disseminating information on QE related issues, and upon request by the PMs provide coordination in scheduling tests of similar items, organize QE conferences, and participate in QE planning and execution.

(2) Manage, technically direct, and execute all life cycle responsibilities, including all budgeting and execution functions, for the Navy and Marine Corps QETE Program to support all Navy and Marine Corps conventional ordnance QE efforts.

(3) Ensure QE technologies, equipment, and processes are fully compatible and integrated with the Navy's Insensitive Munitions (IM) Program, reference (d).

(4) Execute life cycle responsibilities, including all budget and execution functions, for the QETE Program.

(5) Participate in the semi-annual QE review.

(6) Support Naval forces on QE related procedures and technology issues at forums; e.g., Joint Ordnance Commanders Group (JOCG), Department of Defense (DOD)/Department of Energy (DOE) Technical Coordinating Groups, Data Exchange Agreements, and Foreign Military Sales.

e. Naval Supply Systems Command, via NAVAMMOLOGCEN, shall:

(1) Provide inventory management support in positioning unserviceable ordnance in support of ordnance maintenance pipelines.

(2) Publish a Master Repairables Item List (MRIL) to facilitate optimum Fleet turn in/retrograde of unserviceable ordnance

(3) Incorporate ordnance maintenance/production delivery projections into positioning plans and readiness metrics.

J. F. AMERAULT

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