DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
2531 JEFFERSON DAVIS HWY
ARLINGTON VA 22242-5160

IN REPLY REFER TO
NAVSEAINST 5100.3D
SER 03M2/001
26 Jan 98

NAVSEA INSTRUCTION 5100.3D

From: Commander, Naval Sea Systems Command

Subj: MERCURY, MERCURY COMPOUNDS, AND COMPONENTS CONTAINING MERCURY OR MERCURY COMPOUNDS; CONTROL OF

Ref:
(a) OPNAVINST 5100.19, Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
(b) OPNAVINST 5100.23, Navy Occupational Safety and Health (NAVOSH) Program Manual
(c) NAVMEDCOMINST 6260.3, Occupational Health Medical Surveillance
(d) NAVSEA S9510-AB-ATM-010/U, Volume 1 - Nuclear Powered Submarine Atmosphere Control Manual
(e) OPNAV Publication P-45-110-91, Hazardous Material User's Guide
(f) OPNAVISNT 5090.1, Environmental and Natural Resources Program Manual
(g) NAVSEAINST 9210.18, Cleanliness Control and Detrimental Material Control Requirements for Naval Nuclear Reactor Plant Equipment, Components, and Piping Systems
(h) NAVSEAINST 9210.36, Steam Plant Cleanliness Control
(i) NAVSEA 0989-064-3000, Cleanliness Requirements for Nuclear Propulsion Plant Maintenance by Forces Afloat
(j) NAVSEA 0948-LP-045-7010, Material Control Standard
(k) MIL-STD-2041B, Control of Detrimental Materials

1. Purpose. To minimize potential damage to hardware resulting from the use of mercury, mercury compounds, and components containing mercury or mercury compounds by establishing requirements for their control.

2. Cancellation. NAVSEAINST 5100.3C of 4 December 1995 is superseded and hereby canceled.

3. Definitions

a. Boundary of containment. A boundary of containment is a tight seal (barrier) to prevent the release of mercury. A double boundary of containment consists of two independent seals.

b. Functional mercury. Mercury or mercury compound(s) contained in equipment that is required for the equipment to operate properly.

c. Hardware. Any article, piece of material, individual part, subassembly, assembly, component, or system to which mercury control requirements apply.

d. Mercury-free. Hardware is mercury-free if it does not contain functional mercury and is not contaminated by mercury or mercury compounds.

0693-LD-014-8690

4. Background

a. Mercury is a metal that is liquid at room temperature. It weighs about 13.5 times as much as the same volume of water. At room temperature, it has a viscosity on the same order of magnitude as water and cannot be poured without splashing. When spilled, mercury breaks into tiny beads that can lodge in cracks and crevices, collect in sink traps, mix with dust, penetrate porous materials, and cling to vertical surfaces.

b. Mercury may be damaging to hardware surfaces. It alloys with most solid metals (forms an amalgam) rendering them plastic and workable. Mercury and its compounds are especially corrosive to certain non-ferrous metals and their alloys, e.g., silver, copper, aluminum, zinc.

c. In addition to its material degradation properties, mercury is highly toxic and poses a serious health hazard to exposed personnel. The safety and health requirements in references (a) through (e) shall be followed; forces afloat shall follow the requirements of reference (a) or (e), as applicable, for mercury handling and spill clean-up.

d. Mercury is likewise a severely damaging environmental pollutant and is toxic to fresh and salt water marine organisms. Therefore, handling and release of mercury and mercury compounds must be controlled to minimize environmental exposures, and strict compliance with the requirements of reference (f) shall be enforced.

5. Scope. This instruction is applicable to all Naval Shipyards, Ship Repair Facilities, Bases, and Ships, and establishes minimum requirements for mercury control to prevent hardware degradation as a result of mercury contamination. It is not intended to supersede more stringent requirements which may be invoked by other documents.

6. Requirements. Requirements for the controlled use of mercury and prevention of inadvertent mercury contamination are established below.

a. Specific requirements

(1) Mercury or mercury containing compounds shall not be taken onboard naval warships except for functional mercury used in batteries; fluorescent lights; required instruments, sensors, or controls; weapon systems; and chemical analysis reagents specified by NAVSEA. Portable fluorescent lamps and portable instruments containing mercury shall be shock-proof and include a second boundary of containment for the mercury or mercury compound. For Submarines, use of any mercury containing items (R
shall be approved as required by reference (d).

(2) Except for mercury in authorized instruments within a double boundary of containment, mercury or mercury containing products shall not contact hardware surfaces in systems covered by references (g), (h), and (i), as applicable; submarine air systems; Level I systems in accordance with reference (j); or SUBSAFE surfaces during maintenance or repair. Such hardware is designated as mercury-free.

(3) Any hardware surfaces in the above systems which are known or suspected to have come in contact with mercury or

mercury containing compounds shall be checked for evidence of structural degradation and external mercury contamination. The existence of external mercury contamination can be determined in accordance with reference (k).

(4) The presence of mercury in a product may be determined by checking product labeling or material safety data sheets. Chemical analysis is not required.

b. Reporting requirements. All cases where mercury or a mercury compound has contacted hardware surfaces required to be mercury-free shall be reported to NAVSEA 03M. Reports concerning mercury or mercury compounds contacting naval nuclear ship systems covered by references (g), (h), and (i) shall include NAVSEA 08 on the distribution. Reports shall be in letter form and include the date and details of the contact, the surfaces contacted, the recovery actions taken, and the status of the affected surfaces.

c. Procurement. The following clause shall be included in (R
procurement documents for pressure boundary parts or parts that contact system fluid in systems covered by paragraph 6.a.(2): "Mercury or mercury containing compounds shall not be intentionally added or come in direct contact with hardware or supplies furnished under this contract."

7. Inquiries. Inquiries concerning this instruction shall be addressed to NAVSEA 03M or, where naval nuclear plant systems are directly involved, to NAVSEA 08 with copy to NAVSEA 03M.

8. Action

a. Commanding Officers of Naval Shipyards, Ship Repair Facilities, Bases, and Ships shall ensure that the requirements of this instruction are accomplished.

b. Supervisors of Shipbuilding, Conversion and Repair shall ensure that applicable requirements of paragraph 6 pertaining to the control of mercury are incorporated into all new job orders for the repair and alteration of Naval warships.

c. Ship Acquisition Program Managers shall ensure that applicable requirements of paragraph 6 pertaining to the control of mercury are incorporated into contracts for new acquisitions.

M. T. Coyle

M. T. COYLE
Deputy Commander for Engineering

Distribution

SNDL 21A	Fleet Commanders in Chief and Detachments
22A	Fleet Commanders
23	Force Commanders
24	Type Commanders (less 24J)
26Z	Shore Intermediate Maintenance Activities
28	Squadron, Division and Group Commanders - Ships
29	Warships
30	Mine Warfare Ships

31	Amphibious Warfare Ships
32	Auxiliary Ships
35	Historical Warship
36	Service Craft
C84	COMNAVSEASYSCOM Shore Based Detachments
FA10	SUBASELANT
FB13	SUBASEPAC
FB30	NAVSHIPREPFAC
FKM13	SPCC
FKM17	FLEMATSUPPO
FKP	COMNAVSEASYSCOM Shore Activities

Copy to:

SNDL A3	CNO
B5	U.S. Coast Guard (less Navy Liaison Officer)
E3A	LAB ONR
FA13	NAVSUBSUPPFAC
FB42	USNAVOFF FPO San Francisco
FF5	NAVSAFECEN
FF8	Inspection and Survey Board
FH1	COMNAVMEDCOM
FKA1	Systems Commands (less FKA1G)
FKM24	NAVREGCONTCEN
FL4	COMNAVDAF
FT1	CNET
FT5	CNTECHTRA
FT39	NAVTECHTRACEN
FT88	EDOSCOL

NAVSEA Special List Y3

SEA 09A1 (5 copies)

Defense Printing Detachment
1401 South Fern St
Arlington, VA 22202-2889

Stocked: Defense Distribution Depot Susquehanna Pennsylvania (25)
Bldg 05
5450 Carlisle Pike
Mechanicsburg, PA 17055-0789