

MIL-STD-1682/5(SH)
27 October 1976

MILITARY STANDARD

SHIPYARD INSPECTION AND CLEANING
PROCEDURES FOR SUBMARINES

PART 5

MISSILE CONTROL CENTER
SSBN 616 AND 640 CLASSES



FSC 1905

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DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, D.C. 20362

Shipyard Inspection and Cleaning
Procedures for Submarines, Missile Control
Center SSBN 616 and 640 Classes

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1. This Military Standard is approved for use by Naval shipyards during overhaul and conversion periods for submarines.
2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Ship Engineering Center, Center Building, SEC 6124, Prince George's Center, Hyattsville, Maryland 20782 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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FOREWORD

This part provides inspection and cleaning procedures for the Missile Control Center aboard SSBN 616 and 640 Class submarines.

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1. SCOPE

1.1 This part provides inspection and cleaning procedures for the Missile Control Center (MCC) and Ventilation System aboard SSBN 616 and 640 Class submarines. The basic standard and this part are to be considered as an integral single document.

2. REFERENCED DOCUMENTS

NAVSEA Technical Manual, Chapter 9140, Section VI

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. DEFINITIONS

3.1 Clean. Clean is being free of all loose scale, rust, grit, filings, and other foreign substances; and free of oil, grease, and other organic materials.

3.2 Dewpoint. The temperature at which condensation first occurs when a vapor is cooled.

4. REQUIREMENTS

4.1 Safety and precautions.

NOTE: Listed below is a warning appearing in this procedure.
All personnel involved in cleaning the Ventilation
System must fully understand the warning.

4.1.1 Do not use flammable cleaning solvents or solvents in spray form.

4.2 Materials.

4.2.1 Materials required to perform normal inspection and cleaning procedures are as follows:

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- (a) Long-handled mop
- (b) Portable vacuum cleaner (nonmetallic hose)
- (c) Assortment of wiping cloths
- (d) Thermometer
- (e) Cheesecloth
- (f) Closure material: insulating plastic foam (conforming to MIL-P-15280 or equivalent)

5. INSPECTION AND CLEANING PROCEDURES

5.1 FBM MCC ventilation system inspection and cleaning.

5.1.1 Just prior to installing ventilation pipe assemblies, perform 5.1.1.1 through 5.1.1.3.

5.1.1.1 Wipe internals of accessible ducting (supply and return) with a dry, long-handled mop.

5.1.1.2 Apply ship service low-pressure air to internals of ducting to force any loose particles toward ventilation inspection plates.

5.1.1.3 Open inspection plates, and vacuum loose particles from ducts.

5.1.2 After installing pipe assemblies, cover each pipe-assembly outlet with cheesecloth or equivalent.

5.1.3 Just prior to loading the first piece of Fire Control System (FCS) equipment (normally IPJPs), perform 5.1.3.1 and 5.1.3.2.

5.1.3.1 Blow down, vacuum, and wipe clean the overhead return plenum area. Ensure that no loose debris exists in plenum rubber.

5.1.3.2 Vacuum and wipe tank-top and MCC outboard areas.

5.1.4 Verify immediately prior to door loading that underdeck cables, tank-top, and outboard areas are clean. Vacuum and wipe clean as required.

5.1.5 After FCS door loading, and immediately prior to initial FCS light-off, perform 5.1.5.1 through 5.1.5.8.

5.1.5.1 Remove pipe-assembly covering, if installed.

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5.1.5.2 For 616 Class ships, energize fans 64 and 65, run for 10 minutes, then secure.

5.1.5.3 For 640 Class ships, energize fans 31 and 32, run for 10 minutes, then secure.

5.1.5.4 Remove and inspect each piece of cheesecloth for dirt. If any dirt is evident, place a new piece of cheesecloth on appropriate pipe assembly.

5.1.5.5 For 616 Class ships, energize fans 64 and 65 for 5 minutes, then secure.

5.1.5.6 For 640 Class ships, energize fans 31 and 32 for 5 minutes, then secure.

5.1.5.7 Repeat 5.1.5.4 through 5.1.5.6 until all pipe assemblies are receiving clean air, i.e., cheesecloth is clean.

5.1.5.8 Remove MCC fan filters and inspect and clean if required. After FCS is energized and twice weekly remove and clean MCC fan filters associated with fans mentioned in 5.1.5.2 and 5.1.5.3. This should be performed in early stages of testing. Use the ultrasonic cleaner or steam and low-pressure air, as required.

Note: During latter testing stages when workload/traffic in MCC has reduced, clean filters once each week. The decision to clean filters once each week vs twice each week will be made by ITRO Test #C-36-57 Test Director and will be based on results of previous filter inspection/cleanings.

5.2 FBM MCC inspection and cleaning.

5.2.1 After installing the first piece of FCS equipment (normally IPJPs), perform 5.2.1.1 through 5.2.1.4.

5.2.1.1 Daily inspect MCC and clean as required, but at least once each week, as follows:

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- (a) Remove accumulations of dust, chips, etc., from work surfaces, exposed equipment, wire raceways, readily accessible areas of overhead, exposed foundations, deck, etc., using a vacuum cleaner or cloth as required.

- (b) Daily empty refuse containers.

5.2.1.2 Once each 8-hour shift, take psychrometer readings to assure that MCC environmental conditions do not fall in area 4 of figure 1.

5.2.1.3 Daily check that equipments exposed to possible damage are protected by suitable padding or covers.

5.2.1.4 Ensure that welding and grinding activities are isolated from other sections of the MCC by suitable containment.

5.2.2 Perform 5.2.2.1 and 5.2.2.2 when FCS is energized.

Note: Prior to energizing FCS, ensure that the ventilation system fan has reached a steady state condition.

5.2.2.1 Clean MCC as follows on an as required basis, but at least as often as indicated below:

- (a) Install clean vacuum cleaner filter and vacuum deck and any protective coverings to remove accumulations of dust, dirt, or other foreign matter (daily).

Note: Deck discoloration remaining after vacuuming is allowable; however, all loose particles must be removed.

- (b) Clean deck using suitable cleaning solution described in Section VI of NAVSEA Technical Manual, Chapter 9140, when adhered dirt accumulation or discoloration is excessive.
- (c) Compare the compartment dewpoint temperature to the 059 door flue temperature. Using figure 1, apply criteria established by table I.

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A SAMPLE DETERMINATION OF MCC DEW POINT TEMPERATURE FROM MCC WET AND DRY BULB TEMPERATURE IS SHOWN.

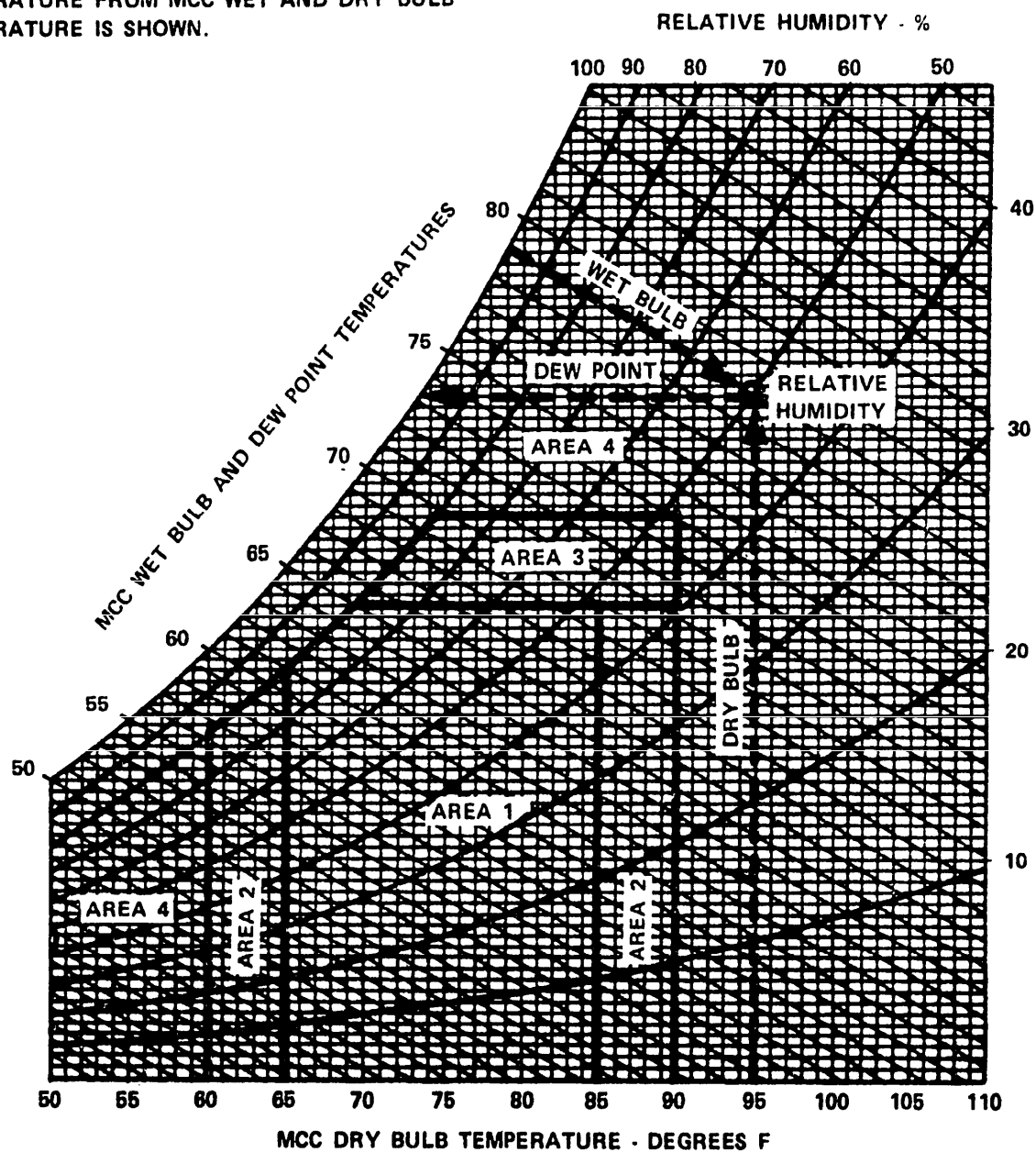


Figure 1. Psychrometric chart

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Table I. Equipment operation

AREA 1	This area is the region of MCC environmental conditions that the shipyard should strive to maintain at all times whether or not the equipment is in operation.
AREA 2	<p>This region represents additional area for MCC equipment operation but should be avoided to maintain operator comfort conditions.</p> <p>Note: Operation in areas 1 and 2 assumes that flue air temperature (incoming) is consistently in the 65°F to 70°F/18.4°C to 21.1°C range.</p>
AREA 3	<p>When conditions of MCC environment are in this area, flue temperature (at the base of the 059 door) should be carefully monitored to ensure that the temperature is never less than 2°F/1.1°C above MCC dewpoint (that is, if MCC dewpoint temperature is 65°F/18.4°C, the flue dry bulb temperature must be at least 65°F + 2°F or 67°F/18.4°C + 1.1°C or 19.5°C.</p> <p>When flue dry bulb temperature approaches 2°F/1.1°C above MCC dewpoint temperature, take the following precaution:</p> <p>Energize portable dehumidifiers.</p> <p>Minimize number of personnel in MCC.</p> <p>Slowly throttle the chilled waterflow in the flue air conditioner in order to increase temperature. (Do not exceed a flue temperature of 72°F/22.3°C).</p> <p>In addition, when operating in this region, constant surveillance must be made to ensure that no condensation occurs on equipment that interfaces MCC and flue environments. FCS grounds must be monitored, and if a humidity-type ground appears, the system must be secured when the resistance drops to 50K ohms or less.</p>
AREA 4	Do not operate. If MCC environment conditions cannot be brought into an acceptable region by corrective techniques described in AREA 3, notify shipyard engineering.

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Table I. Equipment operation (Continued)

<u>EQUIPMENT STARTUP</u>
<p>Prior to energizing electronic equipment, verify that MCC ventilation has reached the steady state within acceptable limits.</p> <p>Monitor the flue metal temperature; then with the chilled water to MCC cooling coil secured, energize fan.</p> <p>Slowly open chilled water to cooling coil, but ensure that flue inlet dry bulb temperature is at least 2°F/1.1°C above MCC dewpoint and that supply air at flue is less than 72°F/22.3°C. Measure flue temperature at the base of the 059 door.</p>
<u>EQUIPMENT SHUTDOWN</u>
<p>Verify that MCC psychrometric conditions are within acceptable limits.</p> <p>Secure electronic equipment first, then chilled water to cooling coils.</p> <p>Wait approximately 1 minute before securing fan.</p> <p>Note: When taking temperature readings, hang the thermometer in mid-aisle in front of the SHIPJP, approximately 5 feet above deck.</p>

- (d) Inspect accessible areas below decks by opening fire control doors and SHIPJP doors. Vacuum and wipe down these accessible areas as necessary. Also, vacuum pipe-assembly outlet screens at this time (twice weekly).
- (e) Remove dust from work surfaces and equipment using wiping cloths and/or vacuum cleaner. Dispose of cloths after use (daily).
- (f) Just prior to securing deck plates for the last time, remove deck plates and vacuum and wipe clean all accessible tank-top and outboard areas including cabling and install closure material (insulation plastic foam), between fire control doors and the deck. This will prevent debris from falling into pipe assemblies and below deck cabling.

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5.2.2.2 Maintain MCC environment as follows:

Note: The shipyard should maintain an MCC environment in accordance with figure 1 and table I whether or not the Fire Control or Test Instrumentation Systems are energized.

- (a) Take MCC psychrometer readings using the following criteria:
 - (1) Once each 8-hour shift when MCC chilled water is being supplied from a dockside source continue taking readings at this frequency until the dockside source has proven its reliability, i.e., maintains a fairly constant 059 door temperature. Once reliable operation is established, readings may be taken once each 24 hours.
 - (2) When operating from ship's chilled water plant, readings may be taken at the discretion of the Test Director and should coincide with periods of high relative humidity or questionable operation of the chilled water plant.
- (b) Compute compartment dewpoint temperature from above readings.
- (c) Compare MCC dewpoint temperature to the 059 door flue temperature. Using figure 1, apply criteria established by table I.

Note: When taking temperature readings, hang the thermometer in mid-aisle in front of the SHIPJP, approximately 5 feet above deck.

Preparing activity:
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(Project 1905-N006-5)

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