

# Naval Safety Center Submarine Mechanical Hazard review



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## Introduction

It is the primary goal of the Naval Safety Center to provide a safe and healthful working environment for all personnel in the fleet. To accomplish these goals periodic safety surveys are conducted on board Navy ships. Information gathered from safety surveys continually identify common discrepancies and safety violations that are common to all commands and include: incorrect stowage of flammable materials, improper respiratory protection and incomplete planned maintenance.

This handout is for forces afloat at the deck plate level. Its purpose is to give fleet personnel a ready reference to information or additional references, which will help, eliminate discrepancies. The information provided is not all inclusive, nor is it intended to be. Many documents have been retyped for reproduction clarity.

General Overhaul Specifications for Deep Diving SSBN/SSN Submarines (DDGOS)  
NAVSEA 0902-018-2010

The DDGOS provides top-level technical and administrative requirements for the modernization and repair of submarines built to Navy standards. The General Specifications for Ships (GENSPEC) no longer applies to the modernization and repair of operational submarines. The DDGOS will supersede any locally issued specifications that are not in compliance with it.

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HRM-1: ELECTROLYTIC OXYGEN GENERATOR CELL REMOVAL FIXTURE  
(EOG-CRF)

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Basic problem:

Submarines did not have the EOG-CRF in a weight test program. (48 month requirement)

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Hazard:

Possible injury during cell removal

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Remarks:

Review CINCLANTFLT/CINCPACFLT 4790.3 JOINT FLEET MAINTENANCE MANUAL Volume 5, para. 7.3.1. This reference requires all weight handling equipment be tested and marked or tagged to indicate completion of weight test prior to being placed into service.

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Reference:

CINCLANTFLT/CINCPACFLT 4790.3 JOINT FLEET MAINTENANCE MANUAL Vol.5, para. 7.3.1

## HRM-2: EYE PROTECTION

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### Basic problem:

Submarines have filthy or were missing eye protection in the following areas:  
TDU Room, grinder, lathe, drill press, and battery well lockers.

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### Hazards:

Injury to eyes and face due to broken glass, disintegrating grinder wheels, metal shavings and caustic liquid (electrolyte), etc.

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### Remarks:

Review NAVOSH PROGRAM MANUAL FOR FORCES AFLOAT OPNAVINST 5100.19D Chapter B5, which requires that personnel working in eye hazardous areas be provided adequate eye protection.

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### Useful stock numbers:

Face shield industrial, tilting	4240-00-542-2048
Face shield industrial, tilting	4240-00-202-9473
Goggles-chemical-splash	4240-00-190-6432
Goggles-industrial-vented	4240-00-052-3776
Goggles-industrial-chipping	4240-00-269-7912

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### Reference:

OPNAVINST 5100.19D Chapter B5

## HRM-3: PNEUMATIC GREASE GUNS AND SHIP LUBRICATION

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### Basic problems:

1. Submarines had pneumatic grease guns that did not meet the requirements of the Submarine greasing handbook, NAVSEA T6350-AA-HBK-010.
  2. Many grease guns had missing gages; broken gages; gages not calibrated; wrong type gages and/or regulator; loose fittings; or were not labeled as required by OPNAVINST 5100.19D. All grease guns and oil cans require labels to show contents. Labels help control hazmat and prevent the use of the wrong compound due to an unlabeled container.
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### Hazards:

1. Personnel injury
  2. Equipment damage
- 

### Remarks:

1. The PMS lubricants, compounds and cleaning agents cross-reference guide has been replaced with the Standard PMS Materials Identification Guide (SPMIG).
2. There is a non-standard lubricant substitution reference guide in NSTM Chapter 262.
3. Use Submarine Greasing Handbook
4. Pneumatic grease gun NSN: 4930-00-720-4849

Note: NAVICP Mechanicsburg Pa 021340Z NOV 01 has identified wrong pneumatic grease guns. The above NSN is correct with the below stated AEL. The incorrect type has a pressure regulator with a pop-up indicator (oil separator and flow meter). This arrangement can lead to over-pressurization of the discharge side on the grease pump. The correct type has a Alemite 7604A (0-200 psi) (NIIN 01-250-8597/AEL 2-920013215) pressure regulator and gage assembly. Any one receiving the wrong type should turn it back into the supply system and submit a quality deficiency report (QDR).

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### References:

- A. NSTM Chapter 262 (Lube oils, Greases, Hydraulic Fluids and Lubrication Systems)
- B. MIP A-001/904 (Steering and Diving)
- C. T6350-AA-HBK-010 (Submarine Greasing Handbook)
- D. AEL 2-920014070

HRM-4: NON-SKID STRIPS/EYE HAZARD BOUNDARY MARKING

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Basic problem:

Inadequate non-skid or eye hazard markings around machinery areas.

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Hazard:

Personnel injury

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Remarks:

NAVOSH PROGRAM MANUAL FOR FORCES AFLOAT OPNAVINST 5100.19D section D804, requires the installation of non-skid strips on the deck (at the point of operation) in front of permanently mounted machine tools. Equipment hazard zones should be clearly marked per ship's plan and specification.

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Useful stock numbers:

Non-skid strips	7220-00-205-0389
Checkerboard yellow and black tape	9905-01-342-5934
Striped yellow and black tape	9905-01-342-5933

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Reference:

OPNAVINST 5100.19D Chapter B5 and D8

## HRM-5: BENCH GRINDER

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### Basic problems:

1. Bench grinders had non-ferrous metal build-up on grinding wheels.
  2. Tool rests and grinding wheel hoods not adjusted properly.
  3. Non-shatter eye shields missing, loose, or missing light bulbs.
  4. Bench grinders generally in disrepair.
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### Hazard:

Serious personnel injury/equipment from operation of unsafe bench grinder.

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### Remarks:

1. Use of a dressing tool can help eliminate grinding wheel imbalance and possible disintegration.
  2. Adjust tool rests to within 1/8 inch of grinding/wire wheels. Adjust grinding wheel hoods facing the operator to not less than 25 degrees and not more than 65 degrees from a vertical line drawn through the spindle center.
  3. Ensure non-shatter eye shields are properly installed, adjusted, and have light bulbs installed.
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### Reference:

OPNAVINST 5100.19D Chapter D8



## HRM-6: SAFETY PRECAUTION SIGNS

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### Basic Problem:

Safety precaution signs missing in the laundry space, at the drill press, grinder, and lathe areas.

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### Hazards:

Inadequate posting of operating and safety instructions at each piece of industrial equipment could cause personnel injury and equipment damage.

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### Useful stock numbers:

Lathe sign	0177-LF-224-3801
Grinder sign	0177-LF-225-3601
Drill Press sign	0118-LF-114-3000
Laundry Equipment	0118-LF-113-5600
Prevent Laundry Fires	0177-LF-008-8200

## HRM-7: TRASH COMPACTOR/TRASH DISPOSAL UNIT (TDU)

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### Basic problems:

1. Operating instructions are not legible or not provided for TDU or compactor.
  2. No provisions for safe, secure stowage of calibrated torque wrench in the TDU room.
  3. Torque wrenches used for operational shafts are not calibrated for bi-directional use.
  4. Missing safety equipment (face shields and gloves)
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### Hazards:

1. Personnel injury
  2. Equipment damage/malfunctions
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### Remarks:

1. This guide of frequent problems should help to insure the proper operation and maintenance of the TDU/compactor by letting the supervisor know what to look for.
2. At the completion of compacting trash, flush the trash compactor drains with copious amount of water to ensure proper operation.
3. Sign for 688 class submarine TDU stating:  
  
"CAUTION: FOLLOWING MAINTENANCE/REPAIR VERIFY INTERLOCK MECHANISMS OPERATE AS DESCRIBED BY 'OPERATION OF INTERLOCK MECHANISM' ON NAVSEA DRAWING 505-4457348"
4. Torque values of over 50 ft-lbs. on operational shafts indicate a problem. This can likely be isolated to one of two areas. Lack of proper maintenance, shaft and components require cleaning and greasing. Shaft component wear or misalignment creating excessive torque conditions.
5. Torque wrench bi-directional calibration has been addressed by Naval Sea Systems Command for incorporation in the METRL for SSN 688 and SSBN 726 Class ships. Other submarine classes are being reviewed for possible incorporation in the METRL.
6. The torque wrench attachment, better known as the "adapter" is required for proper operation of shafts. An adapter converts the wrench's drive size (3/8" or 1/2") to the correct size of the TDU operating shaft which is square (both holes in the adapter are square). The adapter dimensions are included within each class TDU drawing as listed.

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SSN 21 Class-

SSN 637 Class - 505-2143929

SSN 688 Class - 505-4457352

SSBN 726 Class - 609-4676623

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Useful stock numbers (torque wrenches):

SSN 637, 21 and SSBN 726 Class: 5120-00-247-2540

SSN 688 Class: 5120-00-640-6364

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References:

- A. SSM For TDU Operating Procedures
- B. SIB For TDU Operating Procedures
- C. OPNAVINST 5100.19D Chapter D8
- D. MIP A-96 Series

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## HRM-8: STEAM KETTLES

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### Basic problem:

1. Submarines have not performed hydrostatic testing of steam kettle jacket and discharge line IAW PMS.
  2. Submarines have not performed steam kettle relief valve testing IAW PMS.
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### Hazard:

Personnel Injury

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### Remarks:

Perform steam kettles PMS as required.

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### Reference:

1. MIP 6520/001 Series
2. COMSUBLANT 212244Z NOV 01