



**DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, D.C. 20350-2000**

OPNAVINST 5100.19D VOL II CH-1
N45
30 August 2001

OPNAV INSTRUCTION 5100.19D VOLUME II CHANGE TRANSMITTAL 1

From: Chief of Naval Operations

Subj: NAVY OCCUPATIONAL SAFETY AND HEALTH (NAVOSH) PROGRAM MANUAL FOR FORCES AFLOAT, VOLUME II

Encl: (1) Revised pages C1-1, C2-1, C2-2, C3-1, C3-2, C4-1, C4-2, C4-4 through C4-6, C8-1, C8-2, C9-2, C9-3, C13-2, C17-1, C19-3, C20-1, C21-1 and C23-2.

1. Purpose. To update and clarify occupational safety and health guidance for afloat forces.

2. Summary of Changes. Changes to this volume clarify safety procedures for dry cargo operations, underway replenishment, small boat operation, working aloft, and abandoning ship. Chapter C4 was revised to include additional guidance when contracting liberty boats. All paragraphs have been annotated to indicate revisions.

3. Availability. This change transmittal will be incorporated into the unclassified compact disk published by Defense Automated Printing (DAPS) Philadelphia. It may also be downloaded at <http://neds.nebt.dap.mil> and <http://www.navosh.net>.

4. Action. Remove pages C1-1, C2-1, C2-2, C3-1, C3-2, C4-1, C4-2, C4-4 through C4-6, C8-1, C8-2, C9-2, C9-3, C13-2, C17-1, C19-3, C20-1, C21 and C23-2 and replace with enclosure 1 of this change transmittal.

A handwritten signature in black ink, appearing to read "L.C. Baucum".

**L.C. BAUCOM
By direction**

Distribution:
(Same as basic)

CHAPTER C1
BASIC SAFETY

C0101. DISCUSSION

a. Shipboard life is one of the more hazardous working and living environments that exist. The existence of hazardous materials and equipment, in addition to the fact that a ship is a constantly moving platform subject to conditions such as weather, collision, and grounding contribute to a hazardous environment. Any chain of mishaps could lead to a major catastrophe. It is for this reason, PRACTICAL SAFETY must be followed and the prescribed safety regulations strictly followed to prevent personal injury and illness.

b. As a risk control measure, consider assigning a safety observer, whose only responsibility is safety, during any deck or seamanship evolution that could injure personnel or damage equipment. This safety observer should be knowledgeable in the proper performance of the evolution. Examples of deck evolutions include: underway replenishment, operation of boat davits, rigging pilot and accommodation ladders, and handling lines. (A

c. The general safety standards in the following section are applicable to all shipboard operations and spaces.

C0102. GENERAL SAFETY STANDARDS

Complying with the following standards may save your life:

a. Locate and remember all exits from working and living spaces that you frequent.

b. Know where life jackets and EEBDs are stored in or near your working and living spaces.

c. Make sure that all movable objects in your spaces are secured for sea using appropriate materials.

d. Always wear clothing that snugly fits your body. Wear short sleeves or roll up sleeves when operating rotating industrial machinery.

e. Always move up or down a ladder with one hand on the railing. Never slide down inclined ladders.

f. Know the emergency shut down procedures for all equipment you use.

g. Always ensure exits are not blocked with equipment or boxes.

h. Always ensure ventilation ducts are free of blockage. Never alter ducts or diffusers without permission.

i. Horseplay is prohibited aboard ship.

j. Always remove rings, watches, key rings, and other items that may become entangled or caught on projections, or may be a shock hazard when working with electrical or electronic equipment.

k. Always wear approved safety shoes when required by the job.

l. Walk, don't run in passageways.

m. Always be cautious when nearing a "blind" corner.

n. Know the location of all lifeboat and life raft stations and know how to proceed to them from the living and working spaces you frequent.

o. Know the location of all fire stations and other firefighting equipment in or near the living and working spaces you frequent.

CHAPTER C2

DRY CARGO OPERATIONS

C0201. DISCUSSION

a. Dry cargo is any cargo that is carried in its own container and is not in bulk form, such as fuel. Examples of dry cargo are stores, equipment and machinery that is carried in a ship for its own or another vessel's use.

b. This chapter does not include underway replenishment (UNREP) operations or refueling at sea (FAS) operations except fuel used in drums or other approved containers. UNREP and FAS operations are covered in other chapters.

c. Dry cargo handling evolutions are extremely dangerous, even though they appear routine. Cargo being handled in any manner can fall or shift, causing injury to personnel and damage to the ship. Additionally, damaged hazardous material cargo often causes illness or death in extreme conditions. Cargo handling gear can fail, causing not only cargo damage, but the failed cargo handling gear can itself maim and even kill, as well as cause physical damage. It is for these reasons that extreme care must be used during cargo handling operations.

C0202. PRECAUTIONS - CARGO HANDLING FOR SUPERVISORS

The following precautions are for cargo handling supervisors. Supervisors must initiate these precautions as well as those in NSTM 589 before beginning any cargo handling operations:

(R)

a. Ensure open hatches in use are cleared of adjacent loose equipment which might fall into the hold and injure personnel below.

b. Restrict traffic about hatches to the side away from where cargo is being worked. Rope off areas to traffic over which loads are travelling.

c. Secure or remove hatch beams or other structures in the way of hatches where cargo is being worked. Personnel engaged in moving hatch beams shall wear a safety harness and associated safety lines which shall be tended at all times.

d. Ensure that all personnel handling cargo gear are familiar with the use of their equipment and limitations on load capacity and outreach and are personnel qualifications standard (PQS) qualified.

e. Ensure that trained and qualified signalmen are designated and posted during crane or boom operations.

f. The following crane crew personnel will be qualified, per NSTM 589: Tagline Handler; Rigger; Signalman; Crane Operator; Crane Safety Observer; and Crane Maintenance Technician. Where applicable, NAVEDTRA Personnel Qualification Standards (PQS) are available and should be used to supplement the NSTM qualification requirements.

g. Ensure that there are no obstructions to cargo movement.

h. Verify that all designated cargo handlers are wearing the required personal protective equipment, including gloves (when handling wire rope or

banded material), hard hats, and safety shoes. Ensure all other personnel immediately involved in the cargo handling operations, i.e. safety observer, rig captain, signalmen, winch operator, and winch checker, including personnel observing for training, wear a hard hat with the chin strap in place under the chin.

i. Ensure that all cargo holds to be used are open and hatch covers properly stowed. Ensure all hinged or folding cargo hatches, normally stowed in an upright position are secured with hatch securing pawls and safety preventer chains engaged.

j. Visually verify that all pallets and containers are of the correct type and safe for the use intended. If a pallet appears unsafe, discard or repair.

k. Inspect the cargo handling area and ensure that dunnage is properly stowed clear of all proposed cargo handling activity.

l. Visually check and ensure that all required cargo handling warning signs are properly posted near personnel transit areas.

m. Ensure that all required trim and stability calculations have been completed **before** the cargo is loaded or off-loaded.

n. Visually check and verify that all cargo boom preventer guys, straps, and whips are rigged correctly.

o. If handling ordnance, ensure that all applicable safety standards are followed and enforced.

p. Use caution when using dock or mobile cranes. Rotary cranes, booms and structures can strike and damage the ship's superstructure.

q. Ensure that all suspected unsafe cargo handling gear is tagged out of commission, removed, and tested prior to re-issue.

r. Ensure that all holds and levels being utilized have the required safety barriers (rope, chains, and nets) installed.

s. Verify that all required cargo (save-all) nets are in place.

t. Ensure there are no oily or slick decks where cargo is to be handled.

u. Ensure adequate lighting is provided at the boom heads, cargo holds, and draft areas when conducting nighttime cargo operations.

v. Do not operate any cargo handling system with inoperative safety devices or guards without the specific approval of the commanding officer.

w. Rig suspended baskets/buckets per Naval Ships Technical Manual, Chapter 589. Personnel in the basket/bucket shall wear a safety harness with safety lines attached. Personnel in the basket/bucket shall wear a safety harness with safety lines attached when not suspended over water. When suspended over the water, personnel shall also wear approved lifejackets according to NSTM 077, Section 2.

x. Use correct and well-maintained blocks and sheaves for safe load handling operations.

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CHAPTER C3

UNDERWAY REPLENISHMENT

C0301. DISCUSSION

a. All precautions listed in chapter C2, must be followed, during underway replenishment (UNREP) operations. However, several operations involved with UNREP are unique and require special attention and safety. Vertical replenishment (VERTREP) operations are covered in chapter C7, Helicopter Operations. NWP 4-01-4, Underway Replenishment, contains additional procedures, requirements, safety precautions, and warnings associated with underway replenishment planning, ship handling, personnel, rigs, and transfer operations.

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b. Fueling-at-sea (FAS) and replenishment-at-sea (RAS) involve the transfer of cargo, personnel, and fuel between two or more ships while underway. This involves not only the dangers normally found with cargo transfers but also adds the problem of heavy weather, motion, streaming operations, and the possibility of collisions. For these extra threats, special precautions and practices must exist.

C0302. PRECAUTIONS TO BE OBSERVED PRIOR TO UNREP OPERATIONS

The senior personnel in charge of UNREP Operations shall take the following precautions:

a. Ensure all UNREP equipment and breakaway equipment are in place and properly operational.

b. Ensure all assigned crew members know their duties, are certified where applicable, and are aware of their responsibilities.

c. Test and ensure that proper communications equipment is being used and is operating normally.

d. Ensure that communications (including back-up systems) are established with the UNREP vessel.

e. Ensure UNREP stations have non-slip deck treads or non-skid paint.

f. Ensure all lifelines are in place.

g. Ensure that all UNREP personnel have removed all watches, bracelets, etc., and are wearing life jackets, hardhats, gloves (when handling wire rope or banded material), and safety shoes. Ensure that personnel assigned to work stations are carrying an appropriate knife for routine or emergency use.

h. When fueling, ensure all firefighting stations are properly equipped for any possible cargo fire.

i. Ensure life rings, buoys, and markers are within easy access for UNREP team members, and station lookouts on the fantail for each engaged side.

j. Ensure that all UNREP team members are thoroughly familiar with emergency breakaway procedures. Station-to-station phone talkers and station

captains should discuss emergency breakaway procedures as soon as sound powered phone communications are established. Phone talkers should never fasten the phone strap around their necks. Emergency breakaway procedures shall be issued by the delivery ship, but can be initiated by either ship.

k. Ensure that all cargo handling equipment, including padeyes, are not overloaded.

l. Post UNREP warnings at designated personnel transit areas.

m. Only allow essential personnel at UNREP stations.

n. Ensure that all UNREP personnel wear snug fitting clothes.

o. In cold climates, make sure all ice and snow is removed from UNREP station and the UNREP area deck is properly sanded.

p. During night UNREP operations, ensure that all lights are operating.

q. During personnel transfers:

R) (1) Make sure transferring personnel wear hardhats and authorized life jackets according to NSTM 077 Section 2 and are equipped with whistle, and personal marker lights (PMLs).

(2) Ensure that transferring personnel know how to get out of the transfer chair in an emergency.

(3) Inspect transfer rig before using. In particular, inspect the manila/synthetic highline for evidence of rot, broken strands, cuts, or other signs of weakened condition.

(4) Use only manila/synthetic highlines and messenger lines. Hand tend messenger lines and highlines.

r. Ensure that a ready lifeboat is available in case of an emergency.

s. Clear area of dunnage.

t. Ensure padding is in place for ordnance.

u. Assign a PQS qualified safety observer to every UNREP station during the unrep evolution. Ensure that the safety observer's only function is to watch for hazardous conditions. The safety observer should know the locations of all nearby eye wash stations and be familiar with emergency measures in the event of accidental eye splashing.

v. Ensure a safety brief is held for all participants prior to all UNREP evolutions using the principles of operational risk management (ORM).

C0303. PRECAUTIONS DURING UNREP OPERATIONS

All personnel shall comply with the following:

a. Wear hardhat, gloves (when handling wire rope or banding material), life jacket, and safety shoes.

CHAPTER C4

SMALL BOATS

C0401. DISCUSSION

a. The Navy uses several types of small boats. All can be used for emergency evacuation.

b. The most dangerous operations involving small boats are the launching and retrieval of these boats. It is during these periods that human error and mechanical failure of boat davits and launching/retrieval machinery can occur, and when weather and sea state can have its worst effects.

c. Unsafe contract liberty boats (water taxis) have contributed to the death and injury of Navy personnel. To reduce the hazards associated with these operations, contracts for these services shall specify a minimum level of safety and seaworthiness. In addition, commanding officers shall ensure that a knowledgeable officer inspects water taxis prior to their being placed in service and at least daily thereafter. Section C0405 provides guidance on these safety inspections.

C0402. PRECAUTIONS FOR LAUNCHING AND RETRIEVAL

Observe the following precautions:

a. NEVER ENGAGE A CRANK WHEN HOISTING MOTOR IS ENERGIZED.

b. Inspect all equipment before use, especially the condition of the boat falls, the machinery, and the boat itself.

c. Conduct an operations and safety briefing. Ensure personnel riding the boat wear an authorized securely fastened life jacket and a battle helmet with an unbuckled chinstrap or a safety helmet with the chinstrap fastened under the chin according to NSTM 077, Section 2. Personnel assigned to the boat handling station will dress out the same except they shall always fasten their chinstraps under the chin. (R)

d. Conduct a boat inspection. Inventory equipment; install bilge plug; remove ropes from bags; and check hoisting hook, rings, slings, and bales.

e. Keep non-essential personnel away from the davit area. Do not stand under the boat during lowering or raising.

f. Prepare davit to raise/lower the boat. Post a davit winch watch to monitor the spooling of the wire rope falls.

g. Notify the bridge and raise/lower the boat slowly when cleared. Check that the sea painter is connected. (R)

h. Only permit those persons actually required to be in the boat during lowering or hoisting operations, and they shall hold on to the manropes when provided. Manropes shall be positioned to the outboard side of the boat.

i. Release the stern hook first when launching from a two point lift.

j. Do not launch a boat when own ship's speed is greater than 5 knots. (Does not apply to rigid inflatable boats).

k. Do not hoist boats aboard ship or lower with water in the bilge in excess of that which the installed bilge pumps would normally remove.

l. Properly secure lifting hook bails before a boat is raised or lowered.

m. Be alert for any possible malfunctioning and act quickly if it occurs. Do not lower or raise the davit arms into the davit arm stops at full speed. Do not use limit switches as stop switches.

R) n. When hoisting a motor whaleboat/RHIB with survivors embarked, only three crewmembers are required to be aboard: bowhook, sternhook, and coxswain. Other crewmembers should disembark by alternate means in deference to survivors prior to hoisting the motor whaleboat/RHIB. Although undesirable, when human life is in jeopardy and depending on operating conditions, the motor whaleboat/RHIB limit of seven persons may be exceeded. The boat and boat davit safety factors are sufficient to permit hoisting the motor whaleboat to the rail or deck edge when carrying the full capacity (see Naval Ships Technical Manual (NSTM), Chapter 583, Section 5 for detailed guidance). However, under no circumstances shall the boat be swung in or out when carrying more than seven people.

o. Before raising or lowering a boat, ensure all slings, bale shackles, and pins are seated and seized.

C0403. SMALL BOAT FUELING

a. If possible, fuel a boat in the daytime and while it is in the water with its engine stopped. Fueling a boat at night requires the permission of the officer of the deck.

b. If it is necessary to fuel a boat in its shipboard stowage, provide adequate fire fighting equipment at the scene.

c. DO NOT fuel boats with passengers on board.

d. Prior to fueling, make a grounding connection between the fuel delivery pump and the fuel tank for gasoline propelled boats.

e. Always keep gas cap in place when not fueling.

f. Only personnel specifically authorized by the ship's engineer officer shall fuel small boats.

g. Do not permit smoking or use of non-explosion-proof lights in the vicinity of small boats while fueling operations are in progress.

h. Before starting the engine, inspect compartments and bilges, clean, and ventilate as necessary.

i. Ensure gasoline is stowed only in approved fuel containers, and returned to approved storage location upon completion of the fueling operation.

- m. Ensure boats carry proper fog signaling equipment (refer to NSTM, chapter 583, section 6) and two 18-inch life rings, one forward and one aft. Life rings shall be secured in such a manner that they are easily broken out.
- n. For precautions on charging small boat batteries, see paragraph C0904.
- R) o. Ensure boat crewmembers wear authorized life jackets (IAW NSTM 077, Section 2) under adverse weather conditions, including reduced visibility.
- p. Run boats dead slow when passing other boats that are alongside ships or landings, in narrow or crowded waters, and when passing deeply laden boats.
- R) q. Ensure that authorized life jackets according to NSTM 077, Section 2, are readily accessible in boats for all members of the crew and all passengers. Never allow the number of personnel in the boat to exceed the number of life jackets available.
- r. Do not operate boats with enclosed engine rooms without the engineer being on board and on station, and then only when proper ventilation is assured.
- s. Ensure that boat fire extinguishers are in place and charged.
- t. Ensure that life jackets are always kept dry.
- u. Inspect the electrical system for loose connections and worn insulation before operating a boat and whenever damage to these systems is suspected. Do not operate the boat until corrective action is completed.
- v. Display lights per the "Rules of the Road" when underway between sunset and sunrise or in reduced visibility. (Refer to NSTM, chapter 583, section 6 for guidance).
- w. Ensure shackles and pins are used with anchors. Ensure hoisting slings or bales and steering cables are seized and/or cotter pins are in place.
- x. **Boat Handling System**
 - (1) Be sure winch and davit safety and operating placards, lubrication charts, and test label plates are posted. Ensure winch controls, brake, clutch, and pawl handles are labeled to show function and direction of movement.
 - (2) Always check the wire rope on the winch drum before operation to ensure the wire is properly spooled on the drum.
 - (3) Except in an emergency, check limit switches for operability.
 - (4) Ensure all turnbuckles used on boat gripes are marked to show the limit of tensioning.
- y. Ensure that only qualified (Class II or above) swimmers are assigned as boat crew members.

C0405. CONTRACT LIBERTY BOAT SAFETY

a. Commanding Officers shall ensure that Husbanding Agents and Contractors understand that contract liberty boats must be manned properly (minimum of one operator and two line handlers), operated safely, and secured to the pier or landing with a minimum of two lines during embarkation and debarkation of passengers. Prior to being placed into service, a knowledgeable officer, acting for the commanding officer, shall inspect and approve all contract liberty boats (water taxis) for operational safety. (R)

(1) Ensure the navigation lights, lighted compass, distress signals, and a fog signal device are present and in working condition, and that the area charts are available and current.

(2) Ensure that fire extinguishers are present in sufficient number for the size of the boat.

(3) Verify that there is a working radio aboard, with backup battery, capable of bridge-to-bridge communications.

(4) Inspect the anchor, anchor chain, and mooring lines for adequacy given the size of the vessel. (R)

(5) Verify that the weather deck drains are free from obstructions and drain overboard; not into the bilge.

(6) Check engineering spaces/compartments for fire or flooding hazards.

(7) Conduct a visual inspection topside for conditions which may be hazardous to passengers.

(a) Ensure that the vessel is equipped with sufficient clean and serviceable life jackets for the maximum capacity of the vessel. Life jackets must be stowed in a readily accessible place marked clearly in English.

(b) Verify that decks, railings, doors and seats are structurally sound, latched, and tightened as appropriate.

(c) Ensure that no bare or exposed electrical wires or connections are located in the passenger area.

(d) Validate that sufficient unobstructed exits are present and marked in English.

(e) Verify that no loose gear, potential projectile hazards, or trip hazards exist.

(8) Ensure the operator understands that the boat must be properly secured to the pier or landing with a minimum of two lines prior to allowing passengers to embark or debark. (R)

b. It is impractical to establish detailed specifications for each and every inspection item. Inspectors must use their judgment and experience when advising the commanding officer of the overall safety of the contract water taxi.

c. Any item missing that is critical to safety may be provided by the commanding officer for the duration of the contract boat services. Remember to return any such item at the expiration of the contract. In all cases where government furnished property is provided due to contractor's failure to meet the terms of the contract or the contractor's vessel is unsafe for use, the commanding officer shall immediately notify the contracting officer

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of the circumstances surrounding the deficiency(ies). If the contracting officer is not on site, notification shall be by message.

d. Assign boat officers to the contract water taxis during hours of darkness, or low visibility, and heavy weather. Boat officers shall be PQS qualified by the ship and responsible for maintaining good order and discipline of naval personnel onboard.

R) e. When boat officers are assigned to contract water taxis, they have the authority to not allow boarding when the water taxi's crew performance and navigation are unsatisfactory. Boat officers must ensure boats are securely moored to the pier or landing with a minimum of two lines prior to allowing passengers to embark or debark. When weather conditions are determined to be unsafe, the boat officer has the authority to refuse to get underway.

CHAPTER C8

WORKING OVER THE SIDE OR ALOFT; DRY DOCK SAFETY

C0801. DISCUSSION

a. Since many areas on the exterior of a ship are inaccessible to the crew from decks or built-in work platforms, it becomes necessary to go "over the side" or "aloft" to reach these areas. "Over the side" shall be defined as anywhere outboard of the lifeline system. "Aloft" shall be defined as any mast, kingpost, or other structure where the potential for a fall exists.

b. The greatest hazard associated with working over the side or aloft is the danger of a fall. Other hazards include the dropping of objects on (or by) personnel, asphyxiation, electrical shock and **radiation** burns from transmitting antenna or radar. (R)

c. When a ship is in dry dock, many of the precautions associated with working over the side or aloft must be followed. This chapter will discuss the hazards and precautions associated with this unique evolution.

d. Personnel suspended over the side by a crane are subject to electrical shock and burn hazards from voltage induced in the hoist wire from transmitting antenna and radar. When personnel are suspended over the side by a crane, all precautions listed in this chapter shall be taken.

C0802. GENERAL PRECAUTIONS

a. An appropriate check sheet shall be routed to the OOD/CDO for permission for working over the side or aloft. Example check sheets can be found in appendices C8-A and C8-B.

b. Wear a parachute type safety harness with Dyna-Brake safety lanyard, working lanyard and tending line (as required) with double locking snap hooks. The harness shall be inspected in accordance with established PMS prior to use. The lanyard length shall not exceed 6 feet or the distance from the work to 6 feet above the deck, whichever is shorter.

c. When performing hot work, replace personal safety and staging/boatswain (bosun) chair fiber lines with wire rope. Personal safety lines shall be corrosion resistant steel (CRES) wire rope.

d. Attach safety lanyards to all tools, if practicable. Never carry tools up and down ladders. Rig a line and raise/lower tools in a bucket.

e. Stop work when the ship begins to roll in excess of 10°, or the ship begins to pitch in excess of 6°, or wind speed is greater than 30 knots, and/or an ice storm/lightning threatens.

f. Ensure appropriate signal flags are hoisted. (KIL0 for personnel working aloft; KIL0 ONE for personnel working over the side; KIL0 THREE for personnel working aloft and over the side.)

g. When underway or when working near stacks or exhausts that are actively discharging gases, the commanding officer's permission is required to work aloft or over the side.

h. An experienced senior person shall check the rigging of the bosun chair or staging prior to use. Never rig lines over sharp edges. Inspect lines for damage, rot, and wear.

i. The petty officer in charge shall mark off an area and keep unnecessary personnel clear. He/she shall also maintain a sharp lookout for anything that would cause an increase in ship's motion or drastic change in direction. Personnel must not work over the side during maneuvers with other ships because of the unpredictable nature of these evolutions.

j. Read any safety placards (i.e., radio-frequency radiation warning signs) posted in the area prior to commencing work.

k. Cranes used to suspend personnel over the side shall be certified and work platforms shall be approved by COMNAVSEASYSKOM as safe for manned handling.

C0803. PROCEDURES FOR WORKING OVER THE SIDE

Complete a checklist that contains all of the elements included in appendix C8-B prior to commencing work over the side.

C0804. PROCEDURES FOR PERSONNEL WORKING ALOFT

Complete a checklist that contains all of the elements included in appendix C8-A prior to commencing work aloft.

a. Do not go aloft on masts, macks, stacks, or kingposts or be suspended over the side by a crane without first obtaining written permission from the OOD in the form of a working aloft checklist as described in paragraph C0802.

b. Wear the respiratory protection designated by the respiratory protection manager (RPM) when working near stacks or exhaust that are actively discharging gases.

R) c. Use a **parachute type safety harness with a Dyna-Brake safety lanyard, working lanyard, and climber safety device** when going aloft where a climber safety rail is installed. If a climber safety rail is not installed, use a double lanyard configuration.

d. Prior to commencement of work and every 15 minutes thereafter, pass a verbal warning over the 1 MC, **"DO NOT ROTATE ANTENNAS, ENERGIZE OR RADIATE ANY ELECTRICAL OR ELECTRONIC EQUIPMENT WHILE PERSONNEL ARE WORKING ALOFT."** If personnel aloft are in the vicinity of the stacks add, **"DO NOT BLOW TUBES OR LIFT SAFETY VALVES WHILE PERSONNEL ARE WORKING ALOFT."**

e. Inform ships in the vicinity that personnel will be working aloft to ensure they take appropriate action on operation of electrical or electronic equipment.

f. Departments concerned shall ensure that all radio transmitters and radars that pose radiation hazards are placed in the STANDBY position and a sign placed on the equipment that reads: "SECURED. PERSONNEL ALOFT. DATE _____ TIME _____ INITIALS _____."

g. Position a safety observer on deck near the work being performed. Outfit the safety observer with a safety harness, lanyards, Dyna-Brake®, and

(8) Always connect the cord of portable electrical equipment into the extension cord before the extension cord is inserted into an energized receptacle.

(9) Always unplug the extension cord from an energized receptacle before the cord of the portable electrical equipment is unplugged from the extension cord.

(10) Arrange the cords so that they will not create a trip hazard.

(11) Never pick up the tool by the electrical cord.

(12) When drilling/cutting through bulkheads, check opposite side for cables and pipes.

(13) Only use electric equipment in explosive atmospheres if the equipment is approved for such use (explosion proof).

(14) Do not join more than two 25-foot extension cords together.

(15) When it is necessary to run electrical leads through doors or hatches, protect the cord to guard against accidental closing of the door or hatch.

R) (16) Visually inspect portable cables for any signs of an unsatisfactory condition, such as tears, chafing, exposed insulated conductors, and damaged plugs and receptacles. Cables shall be of the proper length and cross-sectional area.

R) (17) Use only COMNAVSEASYSCOM-authorized extension lights for shipboard use to eliminate or drastically reduce the many hazards associated with the use of unauthorized commercial grade lights. The approved lights most frequently used aboard ships are:

(a) A 100-watt incandescent bulb equipped with 50-foot, three conductor cable for use as a general multipurpose extension light, NSN 9G6230-00-701-2947.

(b) A small 4-watt fluorescent tube for servicing electronic equipment. This light is of all plastic construction with no outside conductive surfaces. It is intended for use in open electronic equipment only. It is not explosion proof and is not acceptable for use in hazardous atmospheres.

b. Do not touch a conductor, until it is tested, to be sure it is de-energized.

c. Obey all warning signs; read equipment warning labels before use.

R) d. Never work on live (energized) electrical equipment without the commanding officer's permission and only per paragraph B0705 of this manual.

e. Always de-energize and "tag-out" with red "DANGER, DO NOT OPERATE" tags, installed electrical equipment before starting any maintenance or repair. Test for energized circuits per the Naval Ships Technical Manual (NSTM) Chapter 300.

f. Do not energize any equipment that is tagged-out. Properly clear the tag first.

g. Only use authorized equipment to perform maintenance on electrical equipment. Ground all metal-cased electrical equipment, except power tools verified to be double insulated on the label and by electrical safety check. (R)

h. Close all fuse boxes, junction boxes, switch boxes, and wiring accessories.

i. Use the one-hand rule when turning on electrical equipment. Never operate a switch with the other hand on a metal surface, which would provide a path to ground through the body.

j. Never use outlets that appear to be burnt. Do not use equipment with worn or damaged cords, or crushed or damaged plugs. They are not to be patched with electrical tape. Turn in such items immediately to Electrical Tool Issue, informing them of the problem.

k. Ensure that "dead-man" switches work properly when installed.

l. Use a voltage indicator to test whether equipment or circuits are energized.

m. Never remove overload relays except for replacement.

n. Commanding Officer permission is required when working on energized equipment.

o. Use skin and eye protection when working with wet cell batteries and changing battle lantern batteries.

p. Only install fuses of the rating specified on a fuse box or panel. Do not over-fuse. Identify fuse panels that are missing fuse-rating labels.

q. Do not connect single-phase 115v mobile equipment, permanently located and energized more than 50 percent of the time (copiers, personal computers and their peripherals, vending machines, and money machines) to the ship's isolated receptacle circuits. Connecting this equipment to the ship's isolated receptacle circuits may overload the circuits, resulting in fire hazards. Connect equipment of this type to a separate single-phase circuit through an isolation transformer supplied by the lighting distribution system. See NSTM, chapter 300 for temporary modifications to power such mobile equipment.

r. Do not use aluminum or metal portable ladders when working on electrical equipment.

s. Use only Navy-approved power strips for computer equipment, printers, and peripherals. Never use power strips in series (connected one to another).

C0904. BATTERIES

a. The charging of wet cell batteries will produce hydrogen gas that may be ignited causing fire and explosion. Verify that wet cell battery compartments, which have been sealed, are first opened and well ventilated before entering, turning on any lights, making or breaking any electrical connections, or doing any work in the compartment. Verify that the ventilating apparatus of a wet cell battery compartment is running properly before starting to charge wet cell batteries, and that the exhaust ventilation

equipment with tools of any kind. Should such damage inadvertently occur, report it immediately to the ship's electrical officer.

(11) Do not use compressed air to clean personnel or to perform general housekeeping. Compressed air may be used to clean machinery parts that have been properly disassembled provided that the supply air pressure does not exceed 30 psi or the nozzle is equipped with a 30-psi limiter. Wear safety goggles when using compressed air for cleaning.

(12) Do not store in-use quantities of paints, solvents, acids, or corrosives to unapproved containers. Ensure material compatibility and proper labeling.

(13) Return flammable consumables to approved storage lockers, the HAZMINCEN, or to the flammable liquid storeroom/paint locker at the end of each working day.

(14) Keep containers of flammable or volatile fluids/adhesives tightly closed when not in use.

(15) Supervisors shall ensure that personnel who incur any type of injury or who are exposed to any occupational hazard receives prompt medical attention.

(16) Promptly reinstall shaft guards, coupling guards, deck plates, handrails, flange shields, and other protective devices removed as interference immediately after completion of maintenance on machinery, piping, valves, or other system components.

(17) When working with asbestos-containing material ((Garlock®), spiral wound (flexitallic) gaskets, pipe hangers, clutch plates, brake pads) comply with Chapter B1. Beware of asbestos. Ensure proper handling/disposal requirements are followed (see chapter B1). Asbestos fireproofing material is still common aboard some ships and asbestos can be found in sheet gaskets and some lagging. Train personnel who routinely handle asbestos containing materials on the hazards, proper precautions, protective equipment requirements and disposal.

(18) Do not use low pressure (LP) air to unclog flammable fluid piping systems unless a specific directive or approved procedure requires its use.

C1303. MAINTENANCE

a. Ensure that all installed safety devices, alarms, and sensors are inspected and/or tested in accordance with scheduled Preventive Maintenance System (PMS) and other Type Commander requirements.

(1) Assign the repair of defective safety devices a high priority.

(2) Corrected oil leaks at their source. Wipe up spills of any kind immediately and dispose and store the wiping rags in fire safe containers.

(3) Avoid trip hazards by maintaining proper stowage.

R) (4) Open all drains and vents to all drums and headers before loosening manhole or handhold plates. Stand clear of such fittings when initially opening them after service.

R) b. When maintenance exceeds boundaries of PMS, appropriate supervisors shall ensure the QA documentation and procedures are followed per the Joint Fleet Maintenance Manual (CINCLANTFLT/CINCPACFLTINST 4790.3, vol 5).

CHAPTER C17

ABANDONING SHIP

C1701. SAFETY PRECAUTIONS DURING ABANDONING SHIP

- a. Wear a full set of clothing including shoes and a soft cap or head covering as protection from exposure.
- b. Do not wear a steel helmet when going over the side.
- c. Authorized life jackets in accordance with NSTM 077, section 2, shall be securely fastened. When distance to the water is over 30 feet and/or there is burning oil on the water, throw the life jacket over the side. Inflatable life jackets shall not be inflated until the wearer is in the water. The life jacket shall be inflated as soon as wearer is in the water and/or clear of flames. (R)
- d. Go over the sides by means of a line, ladder, or debarkation net if time permits.
- e. Look first to be sure that water below is clear of personnel or floating gear or wreckage, if it is necessary to jump.
- f. Do not dive, always jump feet first.
- g. Always abandon ship as far away from the damage as possible.
- h. Know direction of the wind and go to windward side of ship, if possible, to avoid flames, oil, and drift of ship.
- i. When in water, concentrate on staying calm and avoiding panic. Obey the following rules:
 - (1) Conserve energy by moving as little as possible.
 - (2) Keep clear of oil slicks if possible. If possible, protect eyes and breathing passages by keeping head high or swimming underwater. If swimming underwater, prior to coming the surface, put hands above head and splash the water surface to disperse oil, debris or flames.
 - (3) If there is danger of underwater explosion, float or swim on the back as near the surface of the water as possible.
 - (4) Stay with other persons in the water to reduce danger of sharks and make rescue easier. In cold water, forming close circles with others will preserve heat.
 - (5) If ship is sinking rapidly, swim clear promptly, and tow injured persons clear, to avoid suction effect.

C1904. SAFE OPERATION OF EQUIPMENT

a. Observe all posted operating procedures for each piece of food service equipment. Additionally, observe all electrical equipment (range, griddle hotplate, and disposals) for exposed, chafed or frayed wiring. (R

b. Ensure all power switches are functional.

c. Ensure all required guards are in place.

CHAPTER C20

LAUNDRIES, DRY CLEANING PLANTS AND PHOTOGRAPHY

C2001. DISCUSSION

Hazards in laundries, dry cleaning plants, and photographic laboratories include mechanical equipment, toxic chemicals, electric power, and heat stress. Safety precautions contained in this chapter are basic and general.

C2002. PRECAUTIONS FOR USING LAUNDRY CLEANERS

See Chapters B3 and C23 for handling and stowage requirements. Personnel shall use protective equipment listed in the Material Safety Data Sheet (MSDS) or current industrial hygiene survey when required. (R)

C2003. PRECAUTIONS FOR LITHOGRAPHIC, PHOTOGRAPHIC AND RADIOGRAPHIC DARKROOMS AND LABORATORIES

a. Ensure each chemical mixing and developing area is equipped with an emergency eye wash station.

b. Avoid skin contact with chemicals. Personnel shall use protective equipment listed in the baseline industrial hygiene survey when required.

c. Clean rubber gloves and other protective equipment after each use.

d. Take care when entering or leaving the area because of the rapid change of lighting and the temporary blindness this causes.

e. Inspect all electrical connections frequently for damage and fraying. Ensure that all electrical equipment is properly grounded, has been safety checked, and approved electrical plugs are used.

f. Never touch an electrical plug, switch, or any part of an electrically operated machine with wet hands or while standing on a wet deck.

g. Use rubber mats with appropriate electrical ratings around equipment that could cause electrical shock.

h. Do not use the photographic chemicals, 1,1,2 Trichloroethane and 1,2,2 Trifluoroethane.

i. Ensure chemicals are properly collected for shore disposal, if required, and that overboard deck drains are secured when a potential for chemical spillage exists.

j. Flash Equipment

(1) Severe electrical shock is the hazard to guard against when using electronic flash equipment. Stored energy in photographic electronic flash units can be lethal (some units operate from voltages as high as 4,000 volts). Use caution whenever operating this equipment.

(2) Only those thoroughly familiar with the equipment shall repair electronic flash equipment. The storage capacitors may have a large charge at high voltage and can be discharged at high amperage which may be lethal.

CHAPTER C21

MEDICAL AND DENTAL FACILITIES

C2101. DISCUSSION

This chapter contains basic safety precautions that medical and dental personnel must observe to protect themselves and their patients from harm. Consult operating manuals and Planned Maintenance System (PMS) Maintenance Requirement Cards (MRC) for complete safety precautions related to specific items of equipment.

C2102. SAFETY PRECAUTIONS FOR MEDICAL AND DENTAL FACILITIES

a. **Special Precautions**

(1) Dispose of disposable needles and syringes in "sharps" containers as an entire unit.

(2) Keep all liquid pesticides under lock and key. Keep bulk amounts in a flammable liquid storeroom.

(3) Ensure that only medical department personnel who are instructed in the proper use and toxicity of the pesticides use them.

(4) Keep all poisons and bulk compounding materials under lock and key.

(5) Double lock the pharmacy when not in use, with keys made available only to authorized personnel.

(6) Do not stow, use, or dispense methyl alcohol in the pharmacy.

(7) Account for methyl alcohol in same manner as ethyl alcohol and narcotics. Attach a prominent label to each container of methyl alcohol with clear warning of its dangerous qualities.

(8) Maintain a poison antidote locker. Secure the locker with a seal and ensure a complete inventory is made whenever the locker seal is broken. (R)

(9) Stow inorganic medical acids such as hydrochloric, sulfuric, nitric and phosphoric in lead-lined containers in the medical storeroom (see paragraph C2306c3). Stow organic acids such as glacial acetic, oxalic, carbolic, cresylic, and picric acids in a locker lined in acid resistant material (not lead) in the flammable liquids storeroom (see paragraph C2306d).

(10) Only keep a minimum working stock of flammable materials (e.g., alcohol and acetone) on hand in medical department spaces. Keep stocks of a bulk nature in a separate locked cabinet in the flammable liquid storeroom.

(11) Ensure only medical department personnel handle bacteriological specimens.

- (1) **Allowed (A).** No restriction on use of this HM on surface ships.
- (2) **Prohibited (P).** HM not allowed aboard surface ships and cannot be requisitioned.
- (3) **Restricted (R).** HM not allowed aboard surface ships except with specific restrictions.
- (4) **Obsolete (O).** HM that is obsolete and in most cases no longer procurable.
- (5) **Not Determined (N).** HM that is under review for authorization for use afloat. This HM shall not be issued or used unless/until it is validated as necessary and action is taken to add it to the SHML.

Equipment and tasking vary among ships within a single type, and configurations of individual ships may vary over time. If a ship has identified a valid requirement for an HM, and that material is either not listed in the SHML or is listed with a P or N, personnel shall complete a SHML Feedback Report (SFR). They may generate this report using Hazardous Material Inventory Control System for Windows (HICSWIN) or Standard Automated Logistics Tool Set (SALTS) software and submit it to the Naval Inventory Control Point (NAVICP) Code 07122, notifying the appropriate type commander and procurement department. NAVICP will screen and flag SFRs for technical commands, which will provide a response within 48 hours of submission via SALTS. If SALTS is unavailable, reference C23-6 provides a hard copy SFR format.

NOTES:

1. The fact that a HM is listed in the SHML does not in itself prove a "valid need" for a given ship to have that item aboard. No ship will have a valid need for all items in the SHML. Each ship must assess its own needs, using the SHML as a guide.
 2. Subsets of the master SHML tailored to individual ship types (Type-SHMLs or T-SHMLs) shall be used by ships for which they are available. T-SHMLs have been built into HICSWIN as the authorized use list for each ship. T-SHMLs are updated monthly and placed in a downloadable repository SALTS for use in updating the HICSWIN T-SHMLs. Ships of a type not covered under the existing T-SHMLs shall use the master SHML as their authorized use list.
- c. **HM Open Purchase.** Navy policy is that, to the maximum extent feasible, ships shall only procure and use standard stock HM.

(1) In **the exceptional case** for which the stock-numbered product can be clearly demonstrated to be inferior, or due to the urgency of need cannot be satisfied from supply system stock, commanding officers may justify and authorize open market purchases of HM for those items. The SFR, when completed and signed by the commanding officer (or a designated officer O-5 or above) and attached to the purchase request, shall be used as the required certification. The ship shall obtain an MSDS from the manufacturer or supplier prior to approval of a new product for purchase or use and retain the MSDS aboard. An SFR with the HMIS MSDS number shall be submitted via SALTS to NAVICP Code 07722, notifying the appropriate type commander and procurement department. If no MSDS number is available in HMIS, submit a hardcopy of the MSDS to NAVICP Code 07722.

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