

Naval Safety Center Submarine Electrical/Electronics Hazard Review



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Introduction

The Naval Safety Center's primary goal is to help provide a safe and healthful working environment for all personnel in the fleet. To accomplish this goal, we send teams of technical experts aboard Navy ships to conduct periodic safety surveys. Information gathered from these surveys continually identifies common problems, hazards and safety violations that are common to all commands. In the area of electrical safety, these problems include a potential electrical shock hazard in Navigation Lighting Panel N-1, poor maintenance of ground straps, and use of unauthorized extension lights.

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 that will help fix discrepancies and solve problems. The information provided is not all-inclusive, nor is it intended to be. Many documents have been retyped for reproduction clarity.

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E-1: ELECTRICAL INSULATING MATERIAL AND DECK COVERING

Basic Problems:

1. Deck covering is needed which meets the criteria for both fire safety and dielectric strength.
 2. Flexible insulation is needed for work inside energized switchboards, power panels, etc.
 3. Improper type of matting found on board submarines.
-

Hazards:

1. Dense smoke if the coverings are involved in a fire.
 2. Electrical shock
-

Remarks:

Three types of electrical matting are available in the supply system:

A. Type I is for permanent installation in areas designated for electrical grade mats or sheets (e.g.) Radio and sonar as listed in reference (B).

B. Type II is for use on surface ships. It is **NOT RECOMMENDED FOR USE ON SUBMARINES** because it does not meet submarine contamination standards.

C. Type III, diamond tread pattern, is available and authorized for use on submarines in accordance with REF (A). Department heads shall ensure that diamond tread matting is installed (except where vinyl sheet is specified) in operating areas, in front and back of propulsion cubicles, test switchboards, power and lighting switchboards, IC switchboards, and fire control switchboards in accordance with REF (B).

The NSNs are:

9Q-7220-01-056-1944 GREEN

9Q-7220-01-057-1897 GRAY

Electrical insulation blankets are available for work inside energized equipment. They come in square pieces with rubber or plastic grommets molded around the edges. The NSN is: 5970-00-296-5322 (36" X 36" X 1/4")

References:

- A. NSTM Chapter 634-3.12
- B. MIL STD MIL-M-15562F (NAVY)

E-2: REPORTING ELECTRICAL SAFETY HAZARDS/SHOCKS

Basic Problems:

1. Personnel are not aware of methods of reporting safety discrepancies.
 2. Personnel are not reporting all electrical shocks.
-

Hazard:

Not being able to identify possible trends thus preventing further incidents.

Remarks:

MRCs should be reviewed from a safety standpoint. Submit a PMS feedback report and send a copy to the Naval Safety Center whenever a safety discrepancy is found.

Use the safetygram. Get them to us and we will see that you get an answer

For a defective material report, NAVSUPINST 4440.120E provides instructions for reporting defective material received from the supply system. Report all defective material received in accordance with this instruction. Ensure that the Naval Safety Center is included in the distribution, so that we can take action. Use a 2 kilo; block 15 with supportive information in the narrative.

References:

- A. PMS Feedback Report
- B. OPNAVINST 5100.19D Appendix A-6-I
- C. NAVSUPINST 4440.120E

E-3: FIRST AID FOR ELECTRICAL SHOCK

Basic Problems:

50 percent of all personnel in electrical/electronic rates are not certified in CPR.

Hazard:

Death as a result of not having a certified CPR rescuer.

Remarks:

1. Ref. C states each ship shall have a certified CPR instructor aboard, certified as a CPR instructor by an authorized agency such as the American Red Cross or American Heart Association.
 2. At least 50 percent of all electrical/electronic-associated ratings shall receive certified CPR training. Certification shall be per the guidelines of the American Red Cross or American Heart Association.
-

References:

- A. NSTM Chapter 300-2.9
- B. OPNAVINST 5100.19D Chapter B7 and D5

E-4: NAVIGATION LIGHTING PANEL (N-1)

Basic Problems:

N-1 circuit breakers have handles reinforced with metal stiffeners that may provide a path for electricity to flow and cause an electrical shock when modified to provide the interlocking feature of some of the breakers in this panel unless the correct hardware is used.

Hazard:

Electrical shock

Remarks:

1. In August of 1996, a shipmate aboard a submarine received an electrical shock when he touched one of the circuit breakers in N-1. The Sailor was showing the lighting panel to a tour group. See a problem? The panel did not comply with the vendor's drawing. INSURV inspection reports identified this potential electrical shock hazard in panels constructed by the Whitmore Company in June 1994. NAVSEA released a message in April 1996, COMNAVSEASYSKOM message P 091215Z APR 96 (NOTAL), directing squadrons to have ships inspect their Navigation Lighting Panels for compliance with the vendor's drawing pending issue of an alteration document to fix this problem.
2. The potential electrical shock hazard is the result of the panel's unique construction. Metal stiffeners are used in the handles of some of the circuit breakers in N-1. The metal stiffeners can provide a current path to the circuit breaker interlocking yoke, a potential shock hazard. Non-conducting bushings and screws are used to insulate the circuit breaker handle metal stiffeners and the circuit breaker interlocking yoke. Technicians and supervisors must be aware of this design feature to ensure the electrical shock hazard is eliminated and is not re-introduced by any maintenance performed on the panel.
3. Alteration and Improvement Item (A&I) N-3171 (for 688 class ships) was issued in November 1996. Ship Alteration Item (SHIPALT) TZ-0856 (for 726 class ships) was issued in March of 1997. A&I N-3171 is applicable to SSN's 690 through 773. SHIPALT TZ-0856 is applicable to all 726-class ships. The alteration documents contain the procedure used to verify non-conducting bushings (NSN 9G-5970-01-094-1582) and screws (NSN 9G-5970-01-094-3317) installed. In addition, they outline the specifications for the warning sign required on the panel cautioning that removal of the non-conducting bushings and screws creates a potential shock hazard.
4. We are finding N-1 panels missing non-conducting bushings, non-conducting screws, and warning signs despite an article on this subject by ETC(SS) Scott in the April-June 1997 FLASH ("Navigation Lighting Panel (N-1) Alteration"). The hardware is missing on most of the panels as the result of a lack of understanding of the hazard created by the missing insulators.

References:

- A. NAVSEA LTR 4720 Ser 393A241/1148 of 25 OCT 96
- B. COMSUBLANT LTR 4720 Ser N4072A/3948 of 12 NOV 96
- C. COMSUBLANT/COMSUBPAC A&I N-3171

E-5: WARNING SIGNS

Basic Problems:

1. Shock hazard areas are not being identified or recognized, especially by those without an electrical background.
 2. Signs are not properly posted, worded, or fabricated.
 3. RF Radiation Hazard warning signs are not posted properly.
-

Hazards:

1. Electrical shock to personnel.
 2. Increased possibility of personnel injury from RF radiation due to lack of warning signs.
-

Remarks:

1. Article 3-20.1 of reference (a) gives requirements for each entrance to compartments or walk-in enclosures:
 - a. Voltages in excess of 500 volts- "DANGER HIGH VOLTAGE" sign.
 - b. Voltages between 30v and 500v- either "DANGER HIGH VOLTAGE" or a "DANGER SHOCK HAZARD" sign.
2. Article 3-18h (2) of reference (A) provides guidance for marking hazards inside equipment.

"DANGER HIGH VOLTAGE" SIGNS

0118-LF-114-3600 (5" X 7")

0177-LF-225-6700 (4" X 8")

0118-LF-113-2400 (2 1/2" X 4")

"RF Radiation Warning" signs

7690-01-377-5895 (5" diamond)

References:

OPNAVINST 5100.19D, Chapter B9

E-6: PROPER INSTALLATION OF GROUND STRAPS

Basic Problems:

1. Missing, loose, or partially insulated ground straps.
 2. Ground straps damaged or not installed properly after relocation of equipment.
-

Hazards:

1. Electrical shock.
 2. Faulty equipment operation.
-

Remarks:

1. Ref. (B) provides detailed instructions for proper grounding techniques applicable to various types of equipment.
 2. Maintenance requirements for ground connectors and conductors are found in Ref. (A).
-

References:

- A. MIL-STD 1310E (NAVY)
- B. NSTM Chapter 300-2.2.1.4

E-7: RUBBER GLOVES

Basic Problems:

1. Gloves are too bulky for use in most electronic applications.
2. Gloves are not being maintained in accordance with PMS requirements.

Hazard:

Electrical shock

Remarks:

1. The class "O" gloves are initially tested to 5,000 volts in accordance with government specifications, but are to be used only on applications of 1,000 volts or less.

NSNs for Class "O" gloves are:

Size	NSN	Use
9	9D-8415-01-158-9453	
9 ½	9D-8415-01-158-9454	
10	9D-8415-01-158-9455	Red label
10 1/2	9D-8415-01-158-9456	Rated at 1000 V
11	9D-8415-01-158-9457	Maximum safe use
11 1/2	9D-8415-01-158-9458	
12	9D-8415-01-158-9459	

NSNs for Class "1" gloves

9	9D-8415-01-158-9449	White label
10	9D-8415-01-158-9450	Rated at 7500 V
11	9D-8415-01-158-9451	Maximum safe use
12	9D-8415-01-158-9452	

NSNs for Class "2" gloves

9	9D-8415-01-158-9446	Yellow label
10	9D-8415-01-158-9447	Rated at 17000 V
11	9D-8415-01-158-9448	Maximum safe use

2. Leather shells are worn over rubber gloves to protect against physical damage NSN 9T-8415-00-264-3618.

3. Gloves shall be stowed in a container to prevent damage by folding, puncture, or other means. A cardboard box or metal box equivalent to the one in which the gloves are shipped shall be used for continued onboard storage.

References:

A. EIMB (NAVSEA 0967-LP-000-0100)

B. NSTM Chapter 300-2.5.3

E-8: PORTABLE TOOLS/EQUIPMENT

Basic Problems:

1. Portable tools not properly grounded.
 2. Unauthorized power tools, appliances and portable equipment (even though procured through the supply system) are being brought aboard navy ships.
-

Hazards:

1. Electrical shock
 2. Equipment damage
-

Remarks:

In accordance with Ref. (A) non conducting cased portable tools and equipment do not require grounding cords and plugs, provided the equipment meets both of the following requirements:

1. Passes an initial inspection for rugged, safe construction.
2. Has a minimum of 1 meg ohm DC resistance from any phase to any exposed metal part (such as chuck housing, mounting screws ear plug jacks, or antennas) or metal chassis.

Much of the burden for accepting or rejecting portable electrical and electronic equipment for ship board use falls on the electrical or electronic officer or other designated personnel to perform the initial inspection of devices brought aboard ship for shipboard or for personal use.

The following equipment is acceptable for use aboard ship:

1. If the portable tool or equipment has the words **DOUBLE INSULATION** or **DOUBLE INSULATED** stamped on its enclosure, it can be assumed to be of rugged safe construction. Much of the portable equipment, which has not been stamped **DOUBLE INSULATION** or **DOUBLE INSULATED**, will be acceptable if they meet the two requirements listed above.
2. All equipment, when tested with a megger, shall have at least one megohm resistance between either side of the line and any exposed metal of the equipment.

When equipment meets the above, it is acceptable with a two prong plug and cord. However, if the equipment was originally provided with a grounding cord and plug, this type of cord and plug shall be retained throughout the life of the device. All portable tools and equipment are required to be tested after any repair has been done to its power cord plug.

Reference (D) states:

No person will have in his possession on board this ship any electrical appliance (other than an electric shaver, toothbrush, or hair dryer) except as authorized by the electrical safety officer, and then only after it has been inspected and proven safe for use on board this ship by the electrical division personnel. When authorized, such electrical equipment will not be used in any space or in any manner other than for which it was authorized.

Before portable electrical tools are used for the first time after procurement, they shall be inspected and approved for shipboard use by the ship's electrical safety officer.

In addition **the user** shall ensure the tool has the current ships inspection mark/tag and inspect the cable for cracks, breaks, or exposed conductors and damaged plugs **prior to use**.

The interval between inspections of portable or personal electrical equipment shall not **exceed** 6 months.

Equipment using batteries as the sole source of energy are generally safe for shipboard use and are not subject to the control and inspection requirements described above. However, should the equipment be provided with a means of operation from the ship's power system, regardless of whether or not this means is employed, it shall comply with all listed requirements.

Prohibited equipment:

Personally owned or non-Navy-standard equipment such as fans, portable extension cords, hi-intensity lamps, reading lamps, electric blankets, heating pads, heat/sun lamps, hot plates, griddles, and electric heaters are prohibited from being introduced and used aboard ship.

All plugs should be tested when received and before each use to ensure that the ground plug does not retract into the plug by pushing on the ground pin and visually inspecting the plug for physical integrity. Plugs with metal shells are prohibited aboard ship.

When procuring portable electrical equipment, check to see that the NSN cross references to the proper Mil-Standard prior to ordering. Also check your COSAL AELs for proper approved operating space items (OSI).

Ref. (A) provides additional guidance concerning appliances and personal electrical equipment checks.

References:

A. NSTM Chapter 300-2.7.3

B. OPNAVINST 5100.19D, Chapter B7 and D5

C. MIL-STD-1310(E) NAVY

D. COMSUBLANT/COMSUBPACINST 5400.39, Chapter 4309

E-9: ELECTRICAL SAFETY CHECKS

Basic Problems:

Electrical safety check program is inadequate

Hazard:

Electrical shock

Remarks:

1. Poor organization of safety check program and identification of new equipment introduced on board results in missed safety checks.
2. Indoctrination of new personnel in procedures for safety checking new, government-owned, portable equipment and personal equipment will alleviate part of the problem.
3. The following method is a suggestion on how to make the program easier to track. But like any other program, it only works as well as the crew wants it to work.

Require each division to make up a list of every portable tool, test equipment using 120v power, and extension cords. This list is then transcribed to a general record card for each division and periodicity. Each cord and tool is listed individually (not as extension cords (5) for example). Each tool is assigned a unique number. Such as ET-S-12 for a tool owned by ET division, which is due semi-annually or M-A-8 which is a tool owned by M division and is required to be checked annually. E division keeps the master lists in a separate binder. When the PMS comes due, E division hands out the lists to the divisions responsible, who then return them when the PMS is complete. The person doing the PMS is required to initial and date the general record card as each item is done. The tag of the tool/extension cord is also annotated with the same number as on the general record card. This makes it possible to verify that all items on the list had been checked. Keep the record cards as an equipment guide list. However, you must attach an EGL to the MRC stating that the EGL's are kept in a separate location.

References:

- A. MIP EL-002 Series
- B. NSTM Chapter 300

E-10: MULTIPLE OUTLET POWER STRIPS

Basic Problem:

Circuit breakers on some power strips are not designed to remove power from both hot leads in an ungrounded submarine electrical system.

Hazards:

1. Electrical shock
 2. Equipment damage
-

Remarks:

1. Power strips that do not have the wording "approved for shipboard use" on their labels are probably not designed to disconnect both hot leads from the power source if the circuit breaker on the power strip disengages. If a power strip is obtained from a commercial source, there is no guarantee that the circuit breaker will operate correctly for a submarine electrical system.
 2. Order the correct power strip from the supply system. Ensure you perform the proper electrical safety check before putting the strip in service.
 3. The correct NSN to use is 6150-01-362-7192. There are different brands of power strips provided under this number. Any of these power strips are authorized if the proper wording listed above is on the label.
-

References:

- A. NSTM Chapter 300-2.7.3.5

E-11: BATTLE LANTERNS

Basic Problem:

Battery acid spills from battle lantern when opening to replace batteries.

Hazard:

Chemical exposure to personnel

Remarks:

Since the change to the battery replacement MRC requiring replacement as-required, there have been several instances of personnel getting battery acid spilled on them. This is especially hazardous in the lanterns mounted above eye level.

References:

A. Lighting on Naval Ships, NAVSEA 0964-000-2000

E-12: PORTABLE EXTENSION LIGHTS

Basic Problem:

Unauthorized or jury-rigged extension lights

Hazard:

Electrical shock

Remarks:

1. Article 3-8.5 of ref. (A) requires that only those portable extension lights that conform to MILSPEC MIL-F- 16377 be authorized for use aboard naval vessels.
2. Ref. (B) gives a description of the four types of explosion-proof and watertight extension lights of general use aboard ships.
3. Ref. (C) gives a description of a small 4-watt extension light for servicing electronic equipment. It is not explosion-proof and is not authorized for use in explosive atmospheres. However, it is totally insulated and very good for use inside electrical or electronic equipment.

NSNs for extension lights:

4-WATT	6230-01-087-6125
8-WATT	6230-00-244-3996
25-WATT	6230-00-283-9671

NSNs for replacement bulbs:

4-WATT	6240-00-151-7634
8-WATT	6240-00-299-5546
	6240-00-427-7448
25-WATT	6240-00-295-2005

References:

- A. EIMB (NAVSEA 0967-LP-000-0100)
- B. NSTM Chapter 330-1.9.2.23
- C. NSTM Chapter 330-1.9.2.26

E-13: TURBIDITY KIT LIGHT SWITCHES

Basic Problems:

Original switch was deemed a safety hazard in 1972. A&I's were to replace the switch with a different type that required special tools and pins to connect the leads. The special tools and pins were rarely furnished with the switches.

The electrical plug used to connect the turbidity test kit to the 120-volt AC power system has an exposed metal strain relief attached to the power cord. This violates Fed-Spec W-C-596E13-3 for electrical connector plugs.

Some turbidity test kits procured before 1981 are connected to the power cord by means of male and female amphenol pin connectors. The male connector is on the power cord and would be hazardous if unplugged from the test kit while the power cord was still plugged into the 120-volt power system.

Hazard:

Electrical shock

Remarks:

In January 1979, NAVSEA 08 issued ACN #8 to NAVSEA 0989-52-0000 Water Chemistry Sampling and Analysis Equipment, changing the requirements for replacing the switch to insulating the terminals and lead connections with heat shrink tubing.

Switches available in the supply system are:

5930-00-655-4247

5930-00-325-6153

Connectors available in the supply system are:

5935-01-005-3579

COMSUBLANT and COMSUBPAC have issued A&I's to authorize ships to make these modifications.

References:

A. COMSUBPAC A&I's N-908, P-483, and A-108

B. COMSUBLANT A&I's B-907, N-1128, R-156, B1022, N-1354, and R-216

C. ACN #8 of JANUARY 1979 to NAVSEA 0989-052-0000

E-14: LAUNDRY DRYERS

Basic Problems:

1. No upper limit on thermostat control.
 2. Low ground readings on heater units.
 3. Excessive lint build up in machine and ventilation system.
 4. Unit not going through cool-down cycle prior to securing.
 5. Asbestos used for heat insulation liner around dryer drum.
-

Hazards:

1. Possible ventilation ducting/clothes fire
 2. Personnel exposure to asbestos
-

Remarks:

1. Filters should be cleaned after each load.

Install fire prevention and instruction/safety placards NSN: 0177-LF-008-8200 and 0177-LF-225-4001

3. Check heater assembly for proper type and COSAL support.
 4. Check for heater assembly plate being installed to improve ground readings. Mfg. Part No. 30-87-B (need two).
 5. Max temperature for synthetic material is 150F.
 6. New 130F to 180F thermostat NSN: 6685-01-117-4782.
 7. For conducting PMS which requires the removal of dryer front, recommend using a 3M toxic dust disposable respirator (NSN 4240-00-629-8199) during performance of PMS.
-

References:

- A. INSURV reports
- B. CSL A&I's B-437, N-529, B-819, and N-1013
- C. CSL A&I's P-234 AND N-454
- D. NS 335-0978 Hoyt submarine clothes dryer

E. NAVSEA LTR 9350 Ser 557/921 of 30 March 1982

E-15: MULTIPLE POWER SOURCE LABELS

Basic Problems:

1. Electrical/electronic equipment is not being properly de-energized during repair/troubleshooting.
2. Equipment is not being electrically isolated properly during casualty situations.

Hazards:

1. Electrical shock
2. Failure to completely isolate spaces electrically during casualty situations.

Remarks:

In accordance with ref. (A) equipment energized from multiple power sources shall have a label affixed indicating circuits to be de-energized to fully secure the equipment.

A 3" x 6" label similar to the one shown below is available through the supply system using NSN: 0116-LF-047-0155.

WARNING

**THIS EQUIPMENT ENERGIZED FROM MULTIPLE SOURCES
TURN OFF THE FOLLOWING TO FULLY DE-ENERGIZE THIS UNIT**

CIRCUIT	SWITCH LOCATION	SWITCH IDENTIFICATION
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

E-16: ICV PANEL PROBES

Basic Problems:

1. Electrical Shock hazard exists on the Full Voltage Probes of the ICV Panel due to no protection to the user from the probe ends if personnel's fingers slip off the probe grip.

Hazards:

1. Electrical Shock
2. Equipment Damage.

Remarks:

1. Melamine washers are required to be installed on all Full Voltage Probes through the use of the following ships drawings:

SSN688 Class:

Newport News DWG 4047-356

SSN21 Class:

Newport News DWG DF4047-1279 or
NAVSEA DWG 313-6404384

SSN774 Class:

EB DWG H751-1521 or
NAVSEA DWG 7068079

SSBN726 Class:

EB DWG 87751-1521 or
NAVSEA DWG 4683397 Rev F

E-17: COMMONLY NEEDED STOCK NUMBERS

Basic Problem:

Personnel not being able to locate stock numbers for electrically related items.

Remarks:

The Naval Safety Center receives numerous calls from the fleet in regards to stock numbers for many different items. These stock numbers can be readily found by looking in the applicable APL, tech manual, or the NSTM **CHAPTER**. The following pages contain the numbers for many of the more commonly asked for items.

References:

A. Various NSTM Chapters

ELECTRICAL STOCK NUMBERS

RUBBER GLOVE LINER	8415-00-782-2809
RUBBER APRON	8415-00-082-6108
FACE SHIELD	4240-00-542-2048 4240-00-202-9473

FUSE PULLERS

(SIZE 1)	5120-00-224-9453
(SIZE 2)	5120-00-224-9456
(SIZE 3)	5120-00-243-2776

RUBBER MATTING DIAMOND TREAD

(GREY)	7220-01-057-1897
(GREEN)	7220-01-056-1944

RUBBER INSULATION BLANKET (36" X 27" 16K VOLTS)	5970-00-351-9578
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RUBBER INSULATION BLANKET (36" X 36" 20K VOLTS)	5970-00-296-5322
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QUART BOTTLE (EYE WASH)	8125-00-782-4000
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LAMP EXTRACTOR	5120-00-288-7679
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FLASHLIGHT (WATER PROOF)	6230-00-270-5418
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4 WATT EXTENSION LIGHT	6230-01-087-6125
8 WATT EXTENSION LIGHT	6230-00-244-3996

VOLTAGE INDICATOR (HAND HELD)	6625-00-132-1196
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INSPECTION MIRROR (NON-CONDUCTIVE) 1.25" DIA. X 13" PLASTIC HANDLE	5120-00-879-4998
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SHORTING PROBE (25K VOLTS)	5975-01-029-4176
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SAFETY TAG (ELECTRICAL)	0116-LF-051-0025
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CIRCUIT BREAKER LOCKING DEVICES

(AQB-A50)	5925-00-360-3984
(AQB-A100,A101,LP100)	5930-00-669-7524
(LP250,LP400,AQB250, AH00,AT400)	5930-00-669-7572

DANGER HIGH VOLTAGE SIGNS

(5" X 7")	0118-LF-114-3600
(4" X 8")	0177-LF-225-6700
(2.5" X 4")	0118-LF-113-2400

SAFETY GLASS CLEAR (EYE SAFETY)	4240-00-516-4728 4240-00-516-4683
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TALCUM POWDER 10 OZ.	8510-00-817-0295
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TAPE INSULATING, WHITE LINEN 1/2" WIDE	5970-00-543-1154
WHITE LINEN 1" WIDE	5970-00-686-9151

TEST LEADS

FLUKE	6625-01-013-5137
UNIVERSAL	6625-01-121-0510

TOOL TESTER (BIDDLE)	6625-01-145-2789
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MEGGER (BIDDLE)	6625-00-141-3558
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3/4 INCH 3/8" DRIVE 6 POINT SOCKET	5120-00-788-5407
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STROBOSCOPE TAG (NAVSEA 9491/2)	0116-LF-000-7700
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RUBBER BOOT (LIGHT SWITCH)	5930-00-539-7013
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RUBBER BOOT (BATTLE LANTERN)	6230-00-496-7492
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RUBBER BOOT (SANITIZER TGL SWITCH)	5975-00-644-0110
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BLUE FILTER TUBE

8 WATT FLORESCENT	6210-00-503-5810
20 WATT FLORESCENT	6210-00-441-5138

RED FILTER TUBE

8 WATT FLORESCENT	6210-00-399-6207
20 WATT FLORESCENT	6210-00-295-2838

LAMP LOCKS

8 WATT	6250-00-399-7039
20 WATT	6250-00-399-7040
 BROAD BAND BLUE 20 WATT BULB	 6240-00-152-2993

PLASTIC TUBE GUARDS FOR FLUORESCENT LAMPS

4' HO (HIGH OUTPUT)	9330-01-028-5639
6' REGULAR	9330-01-028-5642
8' REGULAR	9330-01-028-5638

CLOCK LIGHT BULB

6 WATT	6240-00-143-3049
15 WATT	6240-00-617-1719

FUSE CLIP TYPE FC2DF	5999-00-789-3049
SUBMERSIBLE PUMP	

PRESSURE SWITCH	5930-00-912-3359
MODIFICATION KIT	

MATTING

(POLYVINYL CHLORIDE BASE)

GREEN MARBLE	7220-01-025-1695
BEIGE MARBLE	7220-01-024-9039
BLUE MARBLE	7220-01-024-9040

(SYNTHETIC RUBBER)

TERRA COTTA MARBLE	7220-01-024-9041
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PLACARDS

OPERATING INSTRUCTIONS FOR LAUNDRY	0177-LF-225-4001
DANGER - WORKING ON	0118-LF-020-1400
ENERGIZED EQUIPMENT	

SOLDERING IRONS/GUNS

SOLDERING IRONS (3 CONDUCTOR)	
40 WATT	3439-00-204-3855

SOLDERING GUNS (3 CONDUCTOR)	
145/210 WATT	3439-00-542-0396
240-325 WATT	3439-00-618-6623

SHORTING PROBE REPAIR PARTS

GROUND WIRE	6145-00-194-9840
INSULATION SLEEVING	5970-00-221-5303
NIPPLE	5975-00-988-0649
ALLIGATOR CLIP	5940-00-204-8350

ALKALINE BATTERIES

"AA" BATTERIES	6135-00-985-7845
"C" BATTERIES	6135-00-985-7846
"D" BATTERIES	6135-00-835-7210

EXTENSION CORDS

SINGLE PLUG OUTLET	5905-01-102-5178
TRIPLE PLUG OUTLETS	6150-00-449-1189

BATTERY STOCK NUMBERS

"O" RING FOR FLASH ARRESTOR	5330-00-118-6360
AGITATION SYSTEM COMPONENTS ORIFICE	4730-00-203-7626
TEFLON CLEANING ROD	9330-00-781-7851
AIR SUPPLY TUBE	6140-00-931-4656
PIPE ASSEMBLY TEE	4730-00-319-1191
DUMMY PLUG	5365-00-640-1250

BATTERY TEST KIT (COMPLETE)	6630-00-965-0500
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BATTERY TEST KIT COMPONENTS

HYDROMETER BARRELS	6630-00-290-0500
PLUG RUBBER (TOP)	6630-00-291-8081
PLUG RUBBER (BOTTOM)	6630-00-291-8077
SQUEEZE BULB	6630-00-286-3868
THERMOMETER	6685-00-802-9270
JUMPER CABLE ASSEMBLY (60")	5995-00-024-1009
HEIGHT STICK (GAGE, ELECTROLYTE LEVEL)	6680-00-246-1103
INDICATING WATER FILLING GUN	6140-00-032-4889

HYDROMETER FLOATS

1.230 - 1.310	6630-00-116-5599
1.060 - 1.240	6630-01-049-1009
1.200 - 1.280	6630-00-580-3951

TORQUE WRENCH, INSULATED	5120-01-036-8942
SAFETY GOGGLES	4240-00-052-3776
PORTABLE PRESS WATER STATION	4230-00-551-3134
BATTERY CHARGE/DISCHARGE LOG SHEET	0116-LF-093-2020
SUBMARINE BATTERY RECORD BOOK (NAVSEA 9620/1)	0116-LF-093-2005
SUBMARINE QUARTERLY REPORT (NAVSEA 9620/3)	0116-LF-093-2016

NOTE: Prior to ordering any of the above listed items, check with your supply department to ensure that these NSN's are still current and have not been superseded.