Damage Control
Hazard Review

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 identifies 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 that 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 DDGOS will supersede any locally issued specifications that are not in compliance with it.

Send comments and questions regarding this document to:

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HRDC-1: SALT WATER FIRE FIGHTING EQUIPMENT

Basic problem:

1. Fire fighting equipment is not properly maintained per planned maintenance system.

2. Fire fighting equipment is not IAW NSTM 555.

3. Various parts of the fire fighting stations are missing or spread out too far.

4. Personnel hesitate to use water to combat shipboard fires.

Hazards:

Personnel injury or death.

Major damage to or loss of ship.

Remarks:

1. Examples of maintenance requirements often overlooked:
   a. 36-month hydro test of hoses not accomplished.
   b. Gaskets cut, missing, wrong size, and hard/not pliable.
   c. Fittings are overtightened, No/Inadequate lubrication of threads.
   d. Two wrenches not at each fire hose station.

2. Many stations do not have the necessary two spanner wrenches. A solution to help prevent the loss of the wrenches is to connect them together with a lanyard or to the fire station with a lanyard and a snap clip. Remember to paint or plastisol them red so they are easily identified as D.C.

3. All fire hose fittings (male/female) will be made of brass as per MIL-WW-C-621 and FED SPEC ZZ-H-451. The fitting thread size is 1½-11½ NPSH thread only for 1-½ hoses.

4. Shipboard fire fighting hoses are fabricated to meet MIL-H-24606 hose assembly. This is an orange color impregnated double-jacket hose, which is commonly known as "N-Dura". It is replacing the older white double jacket hose MIL-H-24580. The manufacturer hydrostatically tests all fire hoses at the time of fabrication. To assure the fire hose has not degraded during storage, inspect fire hoses per PMS requirements MRC 6641/Q-6R. You must hydro a hose when the inspection indicates sufficient damage/deterioration that makes the hose integrity suspect, or the hydrostatic test date of 36 months has expired. The manufacturer marks the date on the hose to identify the date it was assembled and tested.

5. NAVSEA released a message (120319Z AUG 97) authorizing a new method to indicate the hydro date on fire hoses. You may use a vibrating engraver to mark the test date on the fire hose male coupling. Do not use number stamps and a hammer since they may damage

the couplings. The information contained in the above message is now incorporated on the PMS card for hydro test of hoses.

6. Only 25-foot hoses are authorized on 688 class submarines and 50 foot hose are authorized on Trident and 21 class submarines. All 11/2 inch 50 ft fire hoses should be phase replaced with 1¾ inch 50 ft fire hoses.
NAVSEA letter dated 27 May 1993, ser: PMS396L2/L409.

7. A SSBN 726 class type zero improvement record, TZ-0778 Rev 0 states that ship's force shall replace the Navy All Purpose (NAP) and four-foot, low velocity, fog applicator located outside of the galley with a Vari-nozzle. This action is dated July 15th, 1993. This also states to remove the PKP extinguisher from the galley and replace with a 2-½ gallon AFFF fire extinguisher, 3rd platform, frame 35.

Useful stock numbers:

25 Ft. 1½ inch N-dura hose	4210-01-264-3871
50 Ft. 1½ inch N-dura hose	4210-01-131-0249
50 Ft. 2½ inch N-dura hose (sub. pump)	4210-01-131-0247
50 Ft. 1¾ inch N-dura hose	4210-01-143-1404
1 1/2 Vari-Nozzle	4210-00-465-1906
1 1/2 hose gasket	5330-00-239-1873
1 1/2 hose gasket (1.562")	5310-00-728-7702
Spanner wrench	5120-00-018-1519
Spanner wrench	5120-01-135-3322

References:

NSTM, CHAPTER 555
MIP 6641 MRCs A-21R, 36M-1R and R-19
AEL 2-930013001 Latest Rev 07/99 (Fire hose and accessories)
AEL 2-930013003 Latest Rev 07/99 (Accessories)
APL 640110019 Latest Rev 07/99 (Vari-nozzle)

HRDC 2: PORTABLE FIRE EXTINGUISHERS (GENERAL)

Basic problem:

1. Tamper seals are frequently broken or missing.

2. Portable Fire Extinguishers are not installed per applicable class ship alteration.

Hazards:

Incorrect extinguishing agent available for a given class of fire.

Inconsistent portable fire extinguisher locations within the same class ship make it difficult for seasoned submariners to locate the required extinguisher.

Remarks:

1. Frequently ships are not up to date on the latest fire extinguisher location guidance. Often there is a PKP extinguisher in the electronics spaces, or perhaps just one CO_2 located in the diesel room. Listed below are the SHIPALTs by submarine class, which specify WHERE certain types of fire extinguishers are to be located. All are current and in effect. Not only do these SHIPALTs aid us in positioning the correct extinguisher in the area of highest probably by class of fire, but also standardizes location within the class which is a great asset when an individual is transferred to a different ship within that class.

CLASS	SHIPALT
SSN 637	N-3027
SSN 688	N-3153
SSBN 616/627/640	B-2062

These SHIPALTs require the removal and/or replacement of portable CO_2 and PKP extinguishers as well as installation of AFFF extinguishers and is designated for forces afloat accomplishment (T/A 2).

References:
Ship Systems Manual (SSMs) and Ships Operating Procedures (SOPs)
MIP 6641

HRDC-3: PKP FIRE EXTINGUISHER

Basic problem:

1. Planned maintenance is not properly performed

2. Nozzles not lubricated with silicone or stuck in nozzle holster.

3. Chemical level too high/low.

4. Post type nozzle holders still in use.

Hazards:

Fire fighting capabilities hindered.

Remarks:

1. Planned maintenance must be accomplished using the maintenance requirement cards.

2. There are still some defective hoses on PKP portable fire extinguishers. Incorrect hoses can be identified using the following information:

a. Inspect the discharge hoses of your PKPs and replace the hose if ANY of the following conditions exist:

(1) There is no identification criteria printed on the hose or the printing is unreadable.

(2) The hose is EX-607, and the date code is between 1Q77 and 4Q83. If dated before 1Q77 or after 4Q83 the hose is good.

(3) The hose is EX-589, check the nut between the hose and nozzle assembly. If the hose nut does NOT have a notch or the part number is not preceded by an "H" (example 6305 vice H-6305) replace the hose.

3. Nozzle post holders are not authorized. Replace the posts with the holster type nozzle holders per PMS 6641 MRC Q-7R Note 4. The replacement for the posts comes as a kit, which contains the holster with mounting hardware, and a smaller nozzle tip that will fit into the holster. Order the modification kit from the supply system using NSN 9C 4210-01-313-4602.

4. Portable dry chemical fire extinguishers and mounting brackets shall be in accordance with MIL-E-24091. Use a weight record card (Form No. NAVSEA 9930/2) to record extinguisher maintenance. Extinguishers shall be of 18-pound capacity and located per the applicable ship's class SHIPALT (SHIPALT numbers list in section HRDC-2).

Maintain enough spare cartridges and dry chemical to replenish at least 50 percent of the installed extinguishers. The cartridges shall be in accordance with MIL-C-24224 CL 1SZ1, and the dry chemical shall be in accordance with FED-SPEC O-D-1407.

5. Many boats are missing the rubber grommets and the proper ring pin and chain assembly on the extinguisher brackets. The manufacturer's part numbers are:

Ring Pin and Chain Ass'y	P/N 53597 - $3.50ea
Back Frame Rubber Grommets	P/N 14089 - $.40ea
Bracket Handle Grommets	P/N 8688 - $.35ea

To open purchase these necessary parts, contact the manufacture as follows:

The Ansul Company
1 Staton Street
Marinette, Wisconsin 54143
PH: (800) 862-6785 Ext. 3580

Useful stock numbers:

Maintenance Record Card, NAVSEC 9930/2	http://daps.forms.mil/
0-5 lb. scale	6670-01-140-0869
Fill cap gasket	5330-00-349-8530
Fill cap quad ring	4210-00-134-8962

References:

MIP 6641
AELS 2-930054090/91 (Non-Trident), 8-930054091 (Trident) PKP fire ext.
APL 640130198 (PKP fire ext.)
MIL-E-24091
GENSPEC: 555d
DDGOS: 555d
AEL 2-930064002 (Non-Trident), 8-930064002 (Trident) 0-5 lb scale

HRDC-4: CO_2 FIRE EXTINGUISHER

Basic problem:

1. Planned maintenance is not being accomplished.

2. CO_2 bottles are past the required hydrostatic test date.

3. Tamper seals are missing or broken.

4. Incorrect horn/nozzle in use.

5. Exposed metal parts on horns not covered with tape.

Hazards:

Fire fighting capabilities hindered.

Remarks:

1. Weighing of the cylinder is required when it is received, the record tag is missing, the tamper seal is missing or broken, and the gross weight is illegible or not present on the tag. This should be recorded on the record tag as a situation requirement. The monthly requirement is to inspect the extinguisher and should be recorded on the tag as a monthly situation requirement.

2. All CO_2 extinguishers onboard submarines contain 15 lbs of CO_2 when fully charged. The note on the maintenance requirement card which states "extinguishers located in areas where ambient temperature may exceed 130°F, such as the fire room, should not be filled in excess of 90% of their rated cap (i.e. 13.5 lbs)" **does not apply to submarines!**

3. The following cylinder identification criteria should be stamped on the top, rounded portion of the cylinder:
   (1) DOT 3AA-2015 or ICC 3AA-2015, (this indicates heavy duty steel)
   (2) U.S. GOVT.
   (3) NON-SHAT
   (4) SPUN
   (5) HYDRO DATE expressed as month-year. If there is a letter character between the month and year, this indicates the certifying activity and is acceptable (i.e. 3E85). Cylinder must be completely discharged and turned in to a supply activity if the latest hydrostatic test date stamped on cylinder exceeds the following: (1) Five years and cylinder requires recharging, (2) Twelve years old since last hydrostatic test.
   (6) If the cylinder has been hydro tested since February 1990, the empty cylinder weight should be stamped on the cylinder curvature area (i.e. "WT" 45.5). The weight is expressed to the nearest tenth of a pound.

4. When checking the weight of the CO_2 fire extinguisher, follow the procedures provided by the MIP 6641/009, MRC R-24.

5. The scale used to weigh the CO_2 fire extinguisher is a 0 to 60-pound scale and reads in 1-oz. increments. Do not use the old 0-100 lbs scale for the CO_2 bottles but keep it for the TDU. There is a cover for the 0-60 lb scale to protect the gauge face.

6. Valves and valve handles must comply with MIL-V-17360, this requires brass or stainless steel handles vice aluminum. If the valve is damaged, it must be replaced at the earliest possible time by a certified activity.

7. Defective discharge hoses have been placed in supply under NSN 4210-00-372-0854. Installation of this hose will seal off the CO_2 at the discharge nozzle of the valve. If you find one of these discharge hoses, submit a Quality Deficiency Report (QDR) and replace the hose with a good one.

a. Imperial Eastman CO manufactured the defective hoses. Hose # E705-SAE-100RI type AT 2500 psi wp 279. Contract # DLA700-82-C-1282.

b. The depth of the threads of the defective hose fitting is 5/8 of inch, and the hole in the fittings is 1/4 inch.

c. The depth of the threads of the correct hose fitting is 13/16 of inch, and the hole in the fitting is 5/16 inch in diameter.

d. The defective hose fitting will not tighten up flush with the extinguisher valve body leaving approximately two threads exposed on the discharge fitting.

e. The correct hose assembly will tighten up flush with the extinguisher valve body leaving no exposed threads.

f. It appears that when shallow defective hose fittings have been installed with excessive force, the brass diffuser tip is being crushed so as to block $C0_2$ extinguisher discharge. Check brass diffuser tip for sign of damage.

8. The Flag portable 15 lb CO2 fire extinguishers are faulty and are experiencing failures at training commands. The valve stem is separating from the plunger. The plunger is becoming a high-speed missile hazard. The fix is to apply Loctite 262(only) to the threaded area and torque to the required value. This repair should only be performed by an authorized repair activity.

9. The following guidance is provided on submarine battery well fires:

a. For all submarines operating at sea, the safest and most effective method available for fighting a battery well fire is through oxygen starvation by securing the well and stopping all ventilation thereto (including the battery air agitation system). However, during routine maintenance operations (at sea or in port) when hot work is performed on the boundary of the well, it is necessary to station a fire watch in the well. It is also not always possible to effectively isolate the battery well during various stages of overhaul. Fire protection for a minor fire under these conditions must be provided by insulated CO_2 fire extinguishers in order to avoid short-circuiting the battery and electrical shock to personnel. Two insulated CO_2 fire extinguishers are to be maintained near the battery well for this purpose.

b. Insulation of CO_2 extinguishers should be accomplished as Follows:

(1) Completely empty the contents of the extinguisher. Ascertain that the hydrostatic test date stamped on the cylinder neck is recent.

(2) Remove cylinder valve and replace with properly threaded eyebolt plug (locally fabricated).

(3) Plastisol coating meeting the requirements of MIL-P- 20689, Type II, Class 1, should be uniformly applied to a dry film thickness of 35 +/- 5 mils to provide the required dielectric strength. Application instructions are contained in NAVSHIPS 0901-190-0002. Naval Ships Technical Manual (NSTM) Chapter 9190, Section 9190.168, and additional information is contained in MIL-P-20689. CARE SHOULD BE TAKEN NOT TO COAT THE CYLINDER NECK, SO THAT THE CYLINDER TEST DATE REMAINS VISIBLE. (UNCOATED NECK AREA TO TOP OF VALVE SHOULD NOT EXCEED 7 INCHES).

NOTE:

THE PLASTISOL FIRE EXTINGUISHERS ARE NOT INTENDED TO BE THROWN INTO THE BATTERY WELL TO FIGHT A BATTERY WELL FIRE.

Quinquennial test requirements and other compressed gas cylinder data are listed in NSTM chapter 9230.

(4) To assure uniformity of plastisol coating for dielectric strength, thickness readings should be taken every four inches along the length of the cylinder, and spaced four inches along the circumference of the cylinder. Thickness measurements should be made with a magnetic type gage specified in NSTM Chapter 9190, Section 9190.42.

(5) Properly applied plastisol should not be porous. If a check for porosity is desired, this can be accomplished by the electrical conductivity test described in paragraph 4.4.1.2 of MIL-R-15058G (SHIPS). The K-D Bird Dog Instrument referred to in that paragraph can also be used for conductivity measurements for determining porosity.

(6) Reinstall cylinder valve. Recharge cylinder with CO_2 and check for leaks in accordance with NSTM chapter 9930.

c. For some submarine classes, a battery well fire could cause excessive heating of the well overhead that forms the weapons space deck. Temperatures must be closely watched and the weapons water-cooled or jettisoned if necessary. Further guidance is contained in Section 6 of the Damage Control Books, in the sub-section entitled "Torpedo or Mine System Fire".

3. The following pen-and-ink change should be made to all submarine (except NR-l) Damage Control Books:

a. Section 6, in the sub-section entitled "Battery Well Fire", change the "WARNING" on use of extinguishers in the well to read as follows:

WARNING

"To avoid short circuiting the battery, never use an uninsulated fire extinguisher in the battery well. Insulated extinguishers are required for use by fire watch personnel when hot work is performed on the boundary of the well or to protect against a minor fire when conditions prohibit isolation of the well; i.e., during various stages of overhaul."

Useful stock numbers:

Scale (0-60 lbs.) w/ protective cover installed.	6670-01-035-5507
Protective cover for 0-60 lb. weigh scale	6695-01-442-8477
Bracket, cable type	4210-00-268-9730
Bracket, running board (Kidde p/n 290511 MOD RB-2)	4210-00-555-1283
CO_2 Band, Plate Identification	9905-00-656-0875
Complete and charged extinguisher	4210-00-203-0217
Replacement cylinder with valve	4210-00-151-9772
PMS Record Card	http://daps.forms.mil/

References:

AEL 2-930054001/2/3 (Non-Trident), 8-930054001 (Trident) CO2 Extinguisher
APL 640140005 (CO2 Extinguishers)
AEL 2-930064032(0-60lb scale)
NSTM, CHAP 555, Firefighting Shipboard
Ship Systems Manual (SSMs) and Ships Operating Procedures (SOPs)
MIP A-6641
MIL-E-24269B (SHIPS)
NSTM 550, Compressed Gas Cylinders

HRDC-5: AFFF PORTABLE EXTINGUISHERS

Basic problems:

1. Out-of-date or missing hydrostatic test dates or bottles

2. Missing or damaged foot stands

3. Air caps missing from air charge valve assembly

4. Extinguishers are not within the proper weight band.

Hazards:

Fire fighting capabilities hindered
Eye irritant

Remarks:

1. The fill tube is used to fill the extinguisher to the proper level, leaving the correct air space at the top of the cylinder. (The fill tube should remain in the extinguisher) The weight must be between 27 lbs 9 oz and 28 lbs 4 oz per MRC annual situational requirement.

2. Aqueous film forming foam (AFFF) light water is a noncorrosive, non-toxic chemical concentrate. When properly proportioned at 1 part concentrate to 9 parts water and properly aerated, it will develop a foaming fire extinguishing agent that will extinguish class A/B fires. Unlike the old protein foam, AFFF does not have to cover the fire area to extinguish the fire. AFFF makes the water float on flammable liquids. The film forms and floats over the flammable liquid surface producing a vapor seal, which extinguishes even difficult, obscured portions of class B fires, and inhibit re-ignition. Its remarkable wetting and penetration properties which are a result of the agents low surface tension, allows fast extinguishment of even the toughest class A fires in deep seated paper, wood, rubber, and plastic materials.

3. AFFF bottles require hydro every five years. If the bottle is new check the hanger loop for the date of manufacture this is also the time of initial hydro. Once the bottle is hydrostatically tested the test facility should attach a tag or label indicating the test date, if this does not happen inquire and demand it. The bottles are not stamped at all except for the manufacture date on the hanger loop.

4. Foot stands and hose straps are an important feature on the bottles. Foot stands need to be installed and in good repair. The foot stands do not have a stock number, the technical manual lists it as piece #16, part #3776 (foot stand, black, with nozzle post). NAVSEA's stand on this issue is if the foot stand becomes damaged, repair as best as possible with tape, glue, or epoxy. If the stand is beyond repair replace the extinguisher with a new one. The hose strap is necessary to cut down on the wear and tear of the hose. The strap stock number is 9C 4730-01-407-0985.

5. An AFFF bottle is required in the galley. Most boats accomplished this alt but some still have not labeled the extinguisher location properly. It is imperative that the location is labeled correctly since in a casualty such as a fire things are confusing enough. If you still have a PKP extinguisher in the galley, change it with an AFFF. (COMSUBLANT/PAC A & I# SSN N-3095 for SSN 690-773, TZ-0778 July 93 for SSBN 726 Class)

6. A big issue lately is the rubber bumpers on the extinguisher brackets. To order missing or damaged bumpers, open purchase them through Amerex, P/N 01990. Amerex's phone number is (205) 655-3271, ask for the government sale office.

Useful stock numbers:

2 1/2 gal extinguisher	4210-01-147-1091
5 Gal AFFF agent (concentrate)	4210-01-056-8343
Extinguisher mounting bracket	4210-01-112-1097
Air charge connection/gauge	4910-00-204-2547
Valve Cap (Box of 100)	5340-01-382-8219
Rubber Bumpers for Brackets, open purchase, Amerex P/N 01990 (See Item 6 for ordering info)	
PMS Record Card	http://daps.forms.mil/

References:

A&I N-3027, Outfitted 637 class with AFFF Ext.
A&I N-3095, Replace Galley PKP with AFFF for 688s
A&I TZ-0778, Replace Galley PKP with AFFF for 726s
APL 649990011 (AFFF fire ext.)
AEL 2-930054130/31 (Non-Trident), 8-930054130 (Trident) AFFF fire ext.
AEL 2-930034028 (AFFF foam)
MIP 6641
ATMOSPHERE CONTROL MANUAL S9510-AB-ATM-010/(U)

HRDC-6: SUBMARINE FIRE PROTECTION

Basic problem:

1. Ships do not know enough about the dangers of a hull insulation fire, an oil mist fire, or a combination of these, and how to combat them effectively.

2. Too much combustible material (Kim-wipes, paper towels, toilet paper, life jackets), being stowed in frame bays or areas that would be hard to detect or combat a fire.

3. Smoke curtains are not installed per applicable A&I. (Listed below in reference section)

Hazards:

Fire, loss of life, loss of ship

Remarks:

1. The Submarine Fire Protection tech notes should be required reading for all hands.

2. Ships should discuss large fire tactics such as hull insulation and oil mist fires as training, and conduct drill scenarios on the major importance of using water.

3. The normal oxygen concentration limits are 130 to 160 torr and 17.0 To 21.0% by volume. However, at 166 torr oxygen, with an internal pressure of 29.9 In hg (758 mmhg) or less, an oxygen concentration of 23% is approached. Any concentration over 21% is an oxygen-enriched atmosphere! The problem is: when the pressure is returned to normal, the torr reading for oxygen increases immediately. This enhances the probability of a fire to start and can have catastrophic results.

4. Supervisors should inspect their spaces frequently to insure combustible materials such as paper items, clothing, etc. are not stored so as to cause a potential fire hazard. DO NOT stow combustible items around hot water heaters, ventilation heaters, steam lines, and in inaccessible areas. A fire in these areas could spread rapidly to the hull insulation.

5. NAVSEA identified the chem lights for EAB manifolds, injured personnel, and key fire fighting personnel. The following stock numbers apply:

EAB manifolds (Green, 4")(100/box)	$55/box	2 boxes-SSNs, 4 boxes-SSBNs	6260-00-106-7478
Injured personnel (Red, 6")(10/box)	$8/box	1 box SSNs & SSBNs	6260-01-178-5559
Key FF personnel (Orange, 6")(10/box)	$8/box	2 boxes SSNs & SSBNs	6260-01-195-9753
Tie wraps (100/box)	$1.45/box	3 boxes-SSNs, 5 boxes-SSBNs	5975-00-984-6582

References:

NSTM CHAP 555, VOL 2
SUBMARINE ATMOSPHERE CONTROL MANUAL, S9510-AB-ATM-010/(U)
SHIPS DAMAGE CONTROL BOOK, CHAPTER 6
688 CLASS AND 726 CLASS SHIP SYSTEM MANUALS
NAVSEA SUBMARINE FIRE PROTECTION TECH NOTES
CSL/CSP A&I N-3008, Smoke curtains for 637 class
CSL/CSP A&I N-3007, Smoke curtains for 688 class
TZ-0639, Smoke curtains for 726 class

HRDC-7: OXYGEN BREATHING APPARATUS

Basic problem:

1. OBAs are poorly stowed and inadequately maintained, missing hot work gloves for handling canisters.

2. Training canister kits are missing or not stowed in separate locked lockers and are not being used for training on a regular basis. Locked with key maintained by DCA.

3. A-4 OBA is out of adjustment causing canister to puncture the seal while in stand-by.

4. Correct short donning procedure not posted on locker cover.

5. PMS is not being accomplished.

6. Draw pull catches on OBA lockers improperly installed or missing.

Hazards:

Loss of life
Personnel injury

Remarks:

1. Canister stowage is not in accordance with applicable drawing/ A&I. Canister stowage must have vertical restraints in place and in use. Stowage of canisters should be in an order so that the oldest canisters are used first. Rotate the canisters from one location to another to try to keep the oldest canisters in locations where they will get used first.

2. Training with the OBA must be stressed at all levels. ANYONE may be required to don an OBA in a casualty situation.

3. Training canisters must be used for "classroom type training only". Never use training canister for drill situations! Be sure to closely supervise a trainee when using an OBA especially when a training canister is in use. The training canisters do not contain superoxide, the only source of oxygen is the candle and oxygen production times vary from one candle to the next (approx. 10 mins). Training canisters can be used over and over again, up to 40 times or when the indicator turns from pink to blue. When a training canister is used mark on the canister the number of times, so you can track when 40 uses are complete. Disposal of training canisters are treated like regular hazmat per NSTM CHAP 077 & 079. The candles can go in the regular trash. A training canister or expended OBA canister may be used for PMS to perform necessary checks but they must be marked "FOR PMS USE ONLY" and stowed in a separate locker to avoid misuse.

4. NSTM Chapter 077 requires stowage of training canister kits in a locker separate from

other OBA canisters and kept locked when not actually in use. Only the DCA has the key.

5. If the canister copper seal is punctured when the OBA is in the stand-by position, the OBA canister adjustment rods are not set correctly or may be bent. The threaded adjustments are set at the factory, and have lock-tight to prevent them from changing. If and when field adjustments must be made, the fasteners must be heated with a match or lighter to soften the lock-tight and prevent the adjustment rods from breaking off.

6. OBA tending lines are optional for use. The line is a 50 ft, 3/16", 7 x 9 aircraft cable with a nylon covering and snap hooks on each end. The line tender should wear rubber gloves and shoes to prevent electrical shocks.

7. Plastic wire ties and Tinnerman clamps are not authorized for use on the breathing tubes of the OBAs. The only acceptable clamps are stainless steel hose clamps. The stock numbers for these clamps are 4730-01-093-7447 and 4730-00-586-8463.

8. The Oxygen Breathing Apparatus is currently provided with a medium size facemask. Also available are large and small size face pieces. The way to tell which size face piece you have is by the color of the ring around the lens. The replacement masks are not provided with hoses or fittings. ONLY the MSA mask can be used with the MSA OBA.

9. Retrofit kits for S-TRON OBAs to improve canister loading and prevent canister drop out while loaded in stand-by are available. These kits contain the parts and instructions necessary to complete the modifications. The kits are S-TRON P/N 120402, OBA Retrofit Kit, ECP's E91-120-273 and E91-120-275. We have a few of these Retrofit kits on hand and will be happy to give them to any command that needs them.

10. OBA lockers use draw pull catches to secure them shut. These catches should not be so tight that when pulled on they snap and take a finger off. There is a template and instructions on the proper installation, a copy is available here at the Safety Center. If you are missing a catch, the NSN for replacement catches is 5340-01-255-5162.

11. The rubber boots over the push button on the Audio Projection Units (APUs) are known to tear easily. To fix this problem, contact Audiopack Sound Systems of Cleveland, Ohio, Mr. Mike Krnc at (216) 651-0066 ext 376. Audiopack will replace the button with one that is sealed internally and doesn't require a rubber boot.

12. Audio projection units have a "2F" COG, which signifies it as a NAVSEA controlled item. You must contact the control point at NAVSEASYSCOM to get replacement units. The control point is Hank Kuzma code 05L4 at (202) 781-3634 (DSN prefix is 326).

13. There is a new style flash hood available for use with the OBAs. It is thicker and longer and better constructed. You can order them standard stock:
- NSN 8415-01-462-7670
- Fire Brigade Mfg. Inc. Shawnee, OK. 1(800)352-0126, style # FB227 PBI Gold. ($33)

Useful stock numbers:

Speaking Diaphragm Tool	5120-01-148-2422	
Timer (A-4)	4240-01-049-1024	
Training kit	4240-00-238-9959	
Canister replacement caps	4240-00-089-7963	
Hose clamp	4730-01-093-7447	
Hose clamp	4730-00-586-8463	
Disinfectant-detergent GP	6840-00-526-1129	
Rubber 1/16" MIL-R-900	5330-00-244-0191	
Ultraview Mask, Small	4240-01-322-6409	Grey lens ring
Ultraview Mask, Large	4240-01-323-3416	Gold lens ring
Improved OBA Flash hood	8415-01-462-7670	

References:

AEL 2-930094061 (A-4 OBA)
AEL 2-930094003/6 (A-4 OBA)
AEL 2-930094071 (Non-Trident) 8-930094070 (Trident) Audio projection sets
APL 990010075 (A-4 OBA Accessories)
NSTM Chapter 555
NSTM Chapter 077
MIP 6641
TECH MANUAL SS600-AA-MMA-010/A-4 of 1 AUG 89 (0910-LP-256-5100)
COMNAVSEASYSCOM ltr Ser 55X2/06 of January 1989, alternate face piece
OBA locker drawing #803-5184184
OBA CANISTER DISPOSAL PROCEDURES
REFERENCE: (A) NSTM CHAPTER 077

1. Canisters require disposal when they are either fully or partially depleted, or when the copper foil seal beneath the tear-off cap has been punctured.

2. DO NOT try to neutralize an OBA canister below decks of a submarine, or in any confined space.

3. Submerged submarines shall place unusable, unfired canisters in a clean metal bucket. If not already punctured, puncture the copper foil seal and fire the candle. Set the canister aside for at least 15 minutes to allow the candle to produce oxygen and cool. When cool enough to handle, recap the canister with a new metal cap, NSN 4240-00-089-7963 (pkg of 10), then:

a. Wrap in double poly bags. Store the poly bag wrapped canisters in a dry, oil free environment until proper at-sea or shore facility disposal is possible. Stowage shall be in a manner that protects the poly bags from tearing, or from heat sources that could melt or ignite the bag.

b. Store in a sealed clean, dry, oil free metal container such as an open head recloseable

drum with gasket. Store the container in a cool, oil free space until proper at-sea or shore facility disposal is possible.

WARNING

REGARDLESS OF CONDITION, NEVER PLACE OBA CANISTERS IN THE TRASH COMPACTOR OR TRASH DISPOSAL UNIT.

4. IN PORT (SHORE FACILITY) DISPOSAL PROCEDURE

Contact the department ashore responsible for hazardous waste management to arrange off loading of expended or unusable OBA canisters.

HRDC-8: EAB MANIFOLDS AND EQUIPMENT

Basic problem:

1. EAB manifolds do not have required chemical lights attached.

2. Regulator clips missing hardware, some not modified per NSTM 077.

3. Incorrect color for the for EAB bags.

4. Non-skid adhesive strip deck markings worn or missing.

5. EABs do not have correct gray anti-flash hoods.

Hazards:

Personnel injury

Contaminated air for breathing

Difficulty locating EAB manifolds in smoke filled compartment.

Remarks:

1. Replace the EAB deck marking per A&I N-1997.

2. EAB bags are to be made of vinyl-nylon cloth; blue bags for EABs with a 25-foot hose and white bags for EAB with 8-foot hoses. The blue bags should be locally produced.

3. Use only MSA clear view mask with red stowage bags for asbestos removal. Label the bag, EAB, and regulator per the applicable A&I. Red bags indicate the EAB is configured for asbestos and MMVF removal (positive pressure).

4. Nuclear propulsion notes authorize the removal of one manifold dust cover on each manifold in the engineering spaces for steam suit usage; however, the dust cap must still be attached so it may be inserted when the ship is in an industrial environment.

5. Remove EAB manifold pop-out panels and hinged access doors per the A&Is listed in the reference section below.

6. Anti-flash hoods and gloves are to be stowed with each EAB. Do not roll gloves in a ball and fold back the sleeve to expose the fuzzy inter fabric of the glove. Roll glove from the open end to the fingers and place inside the facemask to protect the inside of lens and prevent foreign material from entering the mask.

7. MSA EAB regulator belt clips should be modified IAW NSTM 077-3.4.12. An alternate

to this modification is to use a quick release-fastening belt. This belt is preferred when the person wearing the EAB needs to don protective clothing.

8. A&I number N-3200 for SSNs and T-0105 for Tridents identified the chem lights for EAB manifolds. Attach the chem lights with tie wraps by piercing the packet in the vicinity of the tab on top of the light. DO NOT REMOVE THE LIGHT FROM Its PACKET. The chem lights are green, 4", and come in boxes of 100. SSNs require 2 boxes, SSBNs require 4 boxes. Each box cost $55. The stock number is 6260-00-106-7478. The tie wraps come in boxes of 100 with a cost of $1.45. SSNs require 3 boxes while SSBNs require 5 boxes. The stock number is 5975-00-984-6582. NAVSEA in conjunction with SUBLANT verbally authorized the use of alternate methods to attach the chem lights (i.e. shower curtain hooks).

Useful stock numbers:

Dust caps		5340-01-099-9435	
25 Ft. Hose		4240-00-770-0268	
EAB modification kit for asbestos removal		4240-01-077-5994	
Red Non Skid (Rectangle)	9Q	7220-01-358-0808	$2.21 EA
Red Non Skid (Triangle)	9Q	7220-01-358-0809	$1.29 EA
Sealant for Non Skid	9Q	8030-01-352-8101	$92.40 BX
(Box contains 12-4oz tubes)			
EAB storage bag			
(NAVSEA 803-6397317)		8105-01-084-8645	
EAB batteries (MSA)(PX-21)		6135-00-990-1822	
EAB batteries (Scott)(9v, alkaline)		6135-00-900-2139	
Quick release fastening belt		4240-01-250-8280	
Anti-flash hoods(Gray)		4210-01-493-4694	
Anti-flash gloves		8415-01-267-9661	
Belt Clip Screw 5-40x3/16"NP		5305-01-144-8764	$1.39 EA (SS)
		5305-00-916-6215	$.03 EA (Cadmium)

References:

NSTM, Chapter 077-3.4.12 Personnel Protective Equipment
A&I N-1977 (EAB deck markings)
CSL A&I N-1108/B-895, CSP A&I N-885, (Asbestos removal conversion for EAB)
Asbestos Removal Equipment, 2-330024045
MSA AEL 2-330023047, 2-330023070
Scott AEL 2-330023052
Anti-Flash Gear AEL 2-330024080
CSP/LANT A&I B/N/S-1975 & Trident A&I T-0067 (Remove manifold covers)
A&Is N-3200 (SSNs) & T-0105 (Tridents) Chem lights for manifolds

HRDC-9: STEAM SUITS

Basic problem:

1. No hearing protection provided for wearer of suit.

2. Quick disconnects are mismatched or non-operational.

3. Steam suits used in training operations are not stowed separately and marked for training.

4. Steam suits are being improperly stowed causing damage to supply and distribution hoses.

5. Steam suits quantities on board are not correct.

Hazards:

Personnel injury
Burns
Lung damage
Asbestos hazard

Remarks:

1. All steam suits should have the Cool-Flo tubes installed and in good repair. A quick disconnect should be between the suit and the helmet.

2. The quick disconnect installed on the helmet must match the type on the suit. There are two types of QDs on suits; the only authorized is the one-hand operation type (white plastic with single thumb switch).

3. The only authorized air supply hose is the black rubber EAB hose, 25-foot. The old brass wire braid hoses and the red rubber hoses are not allowed. Look out for the faulty type crimps. The crimps on the hoses should be around the fitting not inline with the fitting. The hose must have a metal tag attached stating “FOR STEAM SUIT USE ONLY”.

4. Steam suit should be tightly folded and stowed in a locker to prevent abrasion damage. Frayed suits should be replaced to prevent the spread of fiberglass fibers. If the steam suit is more than 12 years old, it will have asbestos fibers instead of fiberglass and is no longer authorized. Suits with asbestos can be identified by its heavy herringbone weave and is rust/reddish brown color, if you have this type it probably is way past the time to replace anyway. The Kevlar fabric is a bright shiny foil color and has a uniform weave.

5. When a suit is used for training, it must be positively identified with a suitable permanent marking (such as a large red "X") and its stowage container should be marked "FOR

TRAINING USE ONLY" and painted yellow except on Tridents. Per A & I TZ-0688 Tridents store 2 training suits in gray bags and 8 casualty suits in orange bags.

6. The steam suit is not a fire-fighting suit. The only authorized steam suit manufacture is Mine Safety Appliance Company (MSA) and has stopped making replacement suits. The stock system is currently depleted. Other units are not authorized and should not be accepted as a replacement.

7. Shoes must be worn when wearing the suit to provide protection from hot decks. Hearing protection is required when wearing a suit equipped with cool-flow tubes, the best way to ensure this is correct is to put a set of foam earplugs in the helmet prior to tucking the collar up into it and stow a box of spare ear plugs in the locker.

8. MSA does not manufacture the Steam Suit any longer and stock system supplies have been depleted. Using COMNAVSEASYSCOM LTR/11APR2002/92T1H-167 as guidance all SSN's and SSBN's shall remove there steam suits from the maneuvering room stowage location and turn them into their TYCOM rep for further disposition.

Useful numbers:

Oven suit, air fed, large	4240-01-377-6288
Cool-Flo Tube, 8oz	4240-01-186-3991
Disconnect, Quick, (white w/ thumb switch)	4730-01-444-1542
Service Air Hose (25 foot)	4240-00-770-0268
Cool-Flo Hoses	
From helmet to QD	4720-01-444-5041
From manifold to QD	4720-01-444-5030
Leg Hose (Longest Hose)	4720-01-444-5052
Other Hoses order Leg Hose and cut length required.	
Ear Plugs, EAR foam plugs (400/box, NSN for BX or box)	6515-00-137-6345

References:

NSTM, CHAPTER 077, Sect 077-6.2.
SHIPS DAMAGE CONTROL BOOK CHAPTER 3
AEL 2-9300930020 (Non-Trident), 8-930093002 (Trident) Steam suits
A&I TZ-0688 Steam suits (Trident)
Storage container NAVSEA drawing #608-5483587

HRDC 10: NAVY FIRE FIGHTERS ENSEMBLE

Basic problem:

1. Replacement items are not available.

2. Suits neglected and not repaired.

3. Ensembles not stowed in bag to keep clean and in good repair.

Hazards:

Ship's personnel will not be provided the maximum protection available by the FFE.

Remarks:

1. Proper Ensemble Care

Cleaning - A fire fighter's coverall, hood, and gloves must be cleaned properly after every use of actual fire fighting capacity to ensure long lasting protection and wear. Guidance is provided per MRC 6641/R-11.

Whole Ensemble - Be sure that all components are completely dry before storing them. If mildew is found on any part of the ensemble, scrub it off by hand, using a very mild chlorine solution. (Mix about 1/2 ounce of chlorine bleach per gallon of water.) After removing the mildew, follow the cleaning procedures outlined above.

Repairs - The ensemble components are to be repaired or replaced as needed. It is important to keep the fire-fighting ensemble clean and ready to respond to a fire. The ensemble provides protection from heat, steam, hot water, and sharp or falling objects ONLY IF IT IS MAINTAINED PROPERLY.

CAUTION -- Do not penetrate the vapor barrier during repair.

Coverall - ship's force personnel can repair the coverall if the tear is less than 2 inches and the vapor barrier is not penetrated. For tears up to 2 inches in length, surface stitch the tear with high temperature thread (NSN 8310-00-130-6245). If the coveralls have deep cuts, broken zippers or need deep cleaning they must be sent to authorized facility. Either Sea Western Fire Apparatus & Equipment or National Safety Clean Incorporated can repair the coveralls. The following addresses and phone numbers apply:

LANTFLT	PACFLT
National Security Clean Inc.	Sea Western Fire Apparatus & Equipment
225 Birch St.	12815 N.E. 124th Street, Suite H
Kennett Square, PA. 19348	Kirkland, WA. 98034
(800)263-2690	(800)327-5312

Flash Hood - Replace the flash hood if it is damaged or torn or if the elastic around the face breaks.

Gloves - Replace the gloves if the vapor barrier layer is torn. Repair the leather if it is torn or if the stitching is broken for more than 1/2 inch. Use the same thread as on the coveralls.

2. A&I N-1998 provides storage locations and lockers for OBAs and NFTIs. This A&I pertains to 688 class submarines only.

3. Boots and helmets are not required for submarines per NSTM 077 para. 077-4.3.2. and NSTM 555 para 555-34.5.1.2

4. The proper storage bag for FFEs is the flyer's bag, stock #8460-00-606-8366.

Useful stock numbers:

Coveralls:

small	8415-01-300-6556
medium	8415-01-300-6557
large	8415-01-300-6558
x-large	8415-01-300-6559
x-large tall	8415-01-300-6560

gloves(pair)

small	8415-01-241-1368
medium	8415-01-241-1371
large	8415-01-241-1373
x-large	8415-01-241-1375
xx-large	8415-01-241-1376
flash hoods	8415-01-462-7670

References:

NSTM, CHAPTER 077, Personal Protection Equipment
NSTM, CHAPTER 555, VOL 2, Submarine Firefighting
AEL 2-930094085, FFE quantity 1 to 8

Deckplate, May-Jun 91, Vol 11, No. 2
MIP 6641

HRDC-11: PORTABLE OXYGEN-ACETYLENE CUTTING APPARATUS

Basic problem:

1. Emergency cutting kits are incomplete and not ready for immediate use.

2. Portable oxygen-acetylene cutting apparatus is used for other than damage control purposes.

3. The kit does not contain the AEL for proper inventory.

Hazards:

Impaired damage control and emergency repair capability.

Remarks:

1. The following items should be checked:

    a. Gas bottles shall be charged and checked per applicable PMS.
    b. Insure the regulators will attach to the appropriate bottle.
    c. Inventory the cutting kit with the AEL/PMS card to insure that it is complete.

2. If possible keep the kit that is to be used for damage control locked, and have another kit for routine, general use.

Useful stock numbers:

Emergency cutting kit with metal box 3433-00-555-5120

References:

NSTM, CHAPTER 079 (079.39.212)
AEL 2-920016200 (Acetylene)
AEL 2-920016035 (Oxygen)
AEL 2-920013034 (Complete Kit)
MIP 6641
Applicable FLASH articles: Sep-Dec 98, Jan-Feb 98, and Jan 94.

HRDC-12: GALLEY VENTILATION/DEEP FAT FRYER FIRE EXTINGUISHER SYSTEM

Basic Problem:

1. Fusible link not being replaced or tag not hung to display date replaced.

2. Galley exhaust ventilation ducting is not being kept clean of dirt, grease and debris!

3. Inadequate accesses are provided in galley exhaust and on each side of ventilation heaters or cooling coils for cleaning.

4. Fixed fire extinguisher not being maintained properly. Personnel are not familiar with equipment or proper operating procedures. Some believe this is CO_2 vice aqueous potassium carbonate.

5. Insufficient cable length to actuate system. Minimum 3 inches.

Hazards:

Fire
Sanitation
Fire spread by spattered grease upon actuation

Remarks:

1. To insure that galley exhaust ducting is cleaned properly, it may be necessary to remove some sections of the ducting.

2. The range guard system that may be installed does not have the alarms or cutouts mentioned in the tech manual or the damage control book. Each ship must verify their system with the tech manual and compare it to the MIP/MRC and COSAL.

3. Frequent PMS violations:

   a. Main or actuation cylinder pressures below limits.

   b. Nozzle seal disk missing or ruptured.

   c. Tamper seal on cylinder valves are broken or missing.

   d. Pressure switch has not been tested or calibrated.

4. Range Guard System identification:

   a. This information is necessary to determine whether a "B" type range guard system

should be modified. A "B" system is designed for 2 duct nozzles, 2 plenum nozzles, and 2 appliance nozzles. If you have a "B" system, not a modified "B" system, we recommend investigating why it has not been modified.

b. Currently there is no criteria to determine the need to modify a "B" system. If the system was installed as a "B" system, and the only indication of modification you have is the pressure gage, then it probably has not been correctly modified. Either system, "B" or "modified B" will adequately provide the protection needed for the deep fat fryer since only one or possibly two appliance nozzles are installed on your system.

c. The only way to correctly and accurately determine which system is installed is to disconnect the discharge line from the valve, remove the automatic lever control head {7-2-1 of REF B}, and weigh the cylinder, liquid Karbaloy, and cylinder valve assembly all as a single unit. A "B" system with 6 gallons of Karbaloy will weigh approximately 88 lbs. A "Modified B" system with only 4 qts of Karbaloy will weigh approximately 50.5 Lbs.

d. After verifying which system is installed, ensure the main cylinder pressure and pressure switch settings are correct IAW REF 2. Then make a suitable tag or sign listing the system type and pressure required for attachment to the main cylinder.

5. A suitable tag or sign should be attached to the main cylinder that lists the type of system and pressure required.

6. A metal tag is required to show the fusible link's replacement date. This maintenance item is performed under the S-4R MRC.

7. To verify if the needle on the nitrogen bottle in the galley is stuck or not, observe the needle position, wrap a towel full of ice around the outside of the bottle. The pressure in the bottle should decrease as the outside of the bottle temperature decreases. If it does not, assume the gauge needle is stuck and the bottle is under charged or empty and replace/ calibrate the gauge and recharge the cylinder per applicable requirements.

8. There are three different size bottles installed on submarines. The three size cylinders are 8.2 ", 8.6 ", and 8.87". The 8.87" cylinders will fit in the brackets outfitted on the following submarines: SSN-771 through 773, SSBN-742 & 743, and SSN-21 through 23. The 8.6" cylinders are for submarines SSN-761 through 770 and SSBN-736 through 741. Prior submarine hulls with the type "B" system have brackets made to accommodate the 8.2" cylinders. The supply system only carries the 8.87" bottles at this time.

Check the diameter of the existing cylinder before replacement and if it is anything other than the 8.87" then don't turn it into supply, instead have it hydroed by an authorized vendor. This will save you some work (not having to perform mounting bracket rework). If the existing bottle fails the hydro then you will have to get a new one from supply and modify the brackets. This information is based on a message released by NAVSURFWARCEN SHIPSYSENGSTA Philadelphia, Pa, DTG 231810Z MAR 98.

9. The correct fusible link is rated for 360°F, measures .75 inches wide and 2.25 inches long.

Useful stock numbers:

Appliance nozzle	4210-01-061-5705
Nozzle seal disk	4210-01-024-1181
Fusible link	4210-00-443-3526
Potassium carbonate	6810-00-499-5825
Vent check assembly	5340-01-143-4164
Corner pulley	3020-01-230-4009
Steel ID tag	8465-00-242-4804

Mfg is NORRIS INDUSTRIES Fire and Safety Equipment Div. is now under AUTOMATIC SPRINKLER CORP. of AMERICA, CLEVELAND, OH.

References:

NSTM Chapter 555
Tech manual S9555-AR-MMO-010/type rev. 1 of 15 May 90
MIP 5556 (Non-Tridents)
MIP 5553 (Tridents)
S/A SSN 2370
S/A SSN 1671
APL 640190005
APL T640190006 (Trident)

HRDC-13: NAVY FIRE FIGHTERS THERMAL IMAGER(NFTI)

Basic problem:

1. Ships damage the unit through mishandling.

2. Incorrect number of spare battery packs.

3. Battery packs shorting, causing rapid battery discharge.

Hazards:

Ship's personnel will not be provided the maximum protection available by the NFTI.

Remarks:

1. Summary: the following advisory concerns operation of the Naval Fire Fighters Thermal Imager (NFTI). It describes uses, precautions, repair, replacement, and return of defective or damaged units.

2. The NFTI has been in fleet service for many years. The camera is used to see through dense smoke and light steam to locate the seat of a fire or downed personnel in darkened, smoke filled areas. The NFTI senses the difference in infrared radiation emitted by objects with a temperature difference of at least two degrees Celsius. Hot objects appear bright compared to the surroundings, while colder objects appear dark on the TV like viewing screen on the rear of the NFTI. The camera has been employed effectively to quickly locate an unknown fire source in smoke filled compartments and passageways. Its use however is not limited to these conditions. Investigating teams can make effective use of the cameras ability to detect temperature differences when "feeling" for hot hatches or bulkheads, looking for hot spots in cable trays, vents, and voids, locating downed personnel in darkened, smoke filled compartments, and determining the spread of fires across fire boundaries.

3. When a new NFTI is received on board, it should be examined immediately. If the unit has been damaged in transit and is not usable, it is not to be opened nor should any repairs other than replacement of batteries or a fuse, be attempted, this would void the warranty. The complete unit is to be returned to NAVSSES per instructions in paragraph (5). If the unit is operating and acceptable, an OPNAV 4790/CK form should be completed and submitted. An OPNAV 4790/CK form is required for each NFTI on board. Units not identified by this form will not be covered by the present replacement policy described in paragraph (6).

4. Employ the following precautions when using the NFTI under certain conditions.

a. When introducing the NFTI into a smoke filled area, the operator should attempt to pan the camera in both horizontal and vertical directions to obtain the widest possible field of view. Debris, hanging obstacles, and holes in the deck may not be immediately apparent in the 57-degree view angle.

b. The camera cannot "see" through glass. Glass appears opaque to the infrared detector.

c. Firefighting gloves should not be used to wipe the lens because the rough material could damage the lens surface. Carry a couple of clean rags with you for this purpose.

d. Never leave the NFTI lying in the sun or pointed at highly reflective surfaces during drills or actual casualties because the detector can be severely damaged.

e. Excessive steam can degrade the NFTI's performance. In extreme cases, such as a steam leak, the water droplets in the air absorb the infrared radiation produced by the fire. This condition could render the NFTI useless in that immediate area. Usually, the steam generated during normal firefighting will coat the detector lens, distorting the image, and can be removed by wiping off the lens with a clean rag.

f. Soot on the lens can also produce image degradation and can be removed by wiping the lens with a clean rag or spare flash hood.

g. Extremely hot objects can cause the camera to "whiteout", a completely white image. Should this condition occur, try not to look directly at the area, but keep it to the side of the view field or keep the camera moving. Do not dwell on the hot object.

h. A layer of hot smoke may produce a sharp temperature difference that can make it difficult to see sharp details below the layer. This condition can usually be overcome by squatting down to get under the hot layer to view the area below.

i. Internal overheating can sometimes cause the NFTI detector to fail producing a "whiteout" condition. This is a difficult condition to determine, but is usually associated with gradual image degradation, as the detector's electronics become hotter. If moving the camera away from very hot objects or attempting to view under a hot layer does not correct the "whiteout" condition, remove the NFTI from the fire area and allow it to cool until normal operation is restored.

j. Correct stowage of the NFTI when not in use for extended periods is also important to maintain proper operation of the camera when it is needed. The unit should always be stored in its protective case with the lid closed to keep out external infrared radiation. Stowage should be in a cool, approximately room temperature, area to obtain the maximum operating time of the unit at the fire scene. Since operating time is directly related to the internal temperature of the camera, and internal heat is built-up during operation, decreased operating time will occur if the start-up temperature is high. If the NFTI is to be stored for a time period longer than two months, all batteries are to be removed from the battery cartridges and are not to be stored inside the case.

5. Do not attempt to repair a damaged or defective NFTI. Organizational repair of the NFTI is limited to that defined by MIP 6641/9. The NFTI is an IMA repairable item. A defective unit, with case and remaining spare parts, should be shipped, with a completed OPNAV

4790/2K form, to the IMA facility designated by the squadron/type commander.

6. Replacement of defective NFTI's may also be accomplished through the Navy stock system.

7. An OPNAV 4790/CK form should be properly filed out when a replacement NFTI has been requisitioned.

8. Planned maintenance system (PMS), Engineering Operational Sequencing System (EOSS), and technical manuals are not affected by this advisory.

9. NAVSSES point of contact is Mr. Mike Girouard, Code 045C, DSN 443-1278 or commercial (215) 897-1278.

10. INSURV deficiency reports and our own safety surveys often cite ships for not having adequate battery packs for the NFTI. Make sure you have a total of six battery packs for each of the EEV (Old Style) NFTI (one installed in the unit and five spares). The stock number for the battery pack is 9G 6140-01-305-5890. Use **only** alkaline batteries. **DO NOT USE** the Navy olive green carbon batteries. Carbon batteries can leak acid causing internal corrosion damaging electrical components. The stock number for alkaline batteries is 9G 6135-00-985-7845. If you have already tried to replace the batteries and the battery pack still does not work, check the 1 amp fuse in the unit. Remove and conduct a continuity test on the fuse with an ohmmeter. If necessary, replace the fuse with a spare provided with the NFTI outfit. The fuses are shorter than a normal fuse and do not have a stock number. Fuse ordering data is listed below:

NOMENCLATURE: **FUSE**
PART NO: **P4428F**
DESCRIPTION: **FUSE, GLASS, 1 AMP, NORMAL BLOW, 20mm LONG,**
SOURCE OF SUPPLY: **EEV, INC, 4 WESTCHESTER PLAZA, ELMSFORD, NY 10523**
POINT OF CONTACT: **PHONE: 1-914-592-6050, EX 304**

11. A problem exists with the NFTI battery pack (ARCO style). The packs experience overheating and rapid battery discharge. The problem is due to the tight fit of the Kodak battery into the case causing the battery covering to cut and short out on the casing. The Eveready Energizer and Duracell type batteries are a better choice since they are smaller and fit the battery pack much better. The new battery packs have ribs that are smaller, which allow insertion of battery much easier and therefore negate this problem.

To identify the old Arco battery pack, look on the outside of pack, some have a radial ridge half way down the case (a pronounced mold mark). Another way is to disassemble the pack and compare the rib thickness; the defective ones are thicker then the non-defective ones.

12. NAVSEA identified chem lights to identify injured personnel in a smoke filled compartment. Each NFTI case will contain 5 ea, red, 6", chem lights. The NFTI operator

will carry these chem lights with him while moving through a smoke filled compartment. When he comes to an injured person, he will activate the chem light and place it on or near an injured person so rescue personnel can easily locate and remove them. The information on the red chem lights are in section HRDC-6, Submarine Fire Protection, of this manual.

13. Further information will be promulgated later on the Talisman K90-SS2000, which is an authorized replacement for the current "old" style English Electric Valve NFTI.

Useful stock numbers:

NFTI Battery Pack	6160-99-779-8099
NFTI	4210-01-213-7310
NFTI (ISG Talisman)	7HH5855-01-493-5907

References:
AEL 2-930094090 (NFTI)
AEL 99A020090 (Talisman K90)

HRDC-14: TOOL ROLLS

Basic problem:

1. Ships do not have a complete tool roll per the most recent AEL.

Hazards:

1. Inability to combat flooding or other shipboard casualties with the basic tools provided.

Remarks:

1. The only authorized voltage tester is an AUL 1410. Store both voltage testers in separate boxes lined with 1/8-inch rubber. You can fit 5 chem lights in each voltage tester box with the voltage tester; this helps protect the chem lights from inadvertent activation.

2. Store electrical gloves in separate canvas glove bags to prevent puncturing by a tool. The electrical gloves require PMS accomplishment to inspect and powder in inside per MRC 6641/M-2R. The AEL recommends 7500-volt gloves but may keep 5000 or 17,000 volt electrical gloves till they become worn or damaged, then replace with 7500-volt gloves. Gloves are not labeled to indicate voltage except for color-coding on label. The **white-labeled(Class 1) gloves are 7500 volt (NSN 9D 8415-01-158-9450)**, Red(Class 0) are 1,000 volt, Yellow(Class 2) are 17,000 volt, and Green(Class 3) are 26,500 volt.

3. Store the hacksaw frame with a blade installed to prevent losing the blade retaining parts.

4. Be sure to paint all the DC tools red to deter personnel from taking and using them for other than Damage Control.

References:
Tool Roll 5140-01-413-9292
AEL 2-880043004
AEL 7-670052947 (Voltage tester)
NAVSEA Drawing 803-5184262

HRDC 15: BAND-IT KITS

Basic problem:

1. Ships do not have a complete Band-It kit inventory per the most recent AEL.

2. 1/8-inch rubber sheet is not glued to the strong back.

3. Strongbacks have very sharp edges when they are received from supply.

4. Strongbacks are not marked clearly with the size (ie.2, 3,4).

5. Band-it strap containers not used.

6. Band-it material is being precut and taken to casualty in strips.

Hazards:

Inability to combat flooding or other shipboard casualties with the basic tools provided.

Personnel get serious lacerations when handling strongbacks.

Remarks:

1. Do not precut Band-it material from the roll and carry to a casualty in strips. The band-it material is very sharp when cut and can injure personnel and/or equipment it comes in contact with. NSTM 079 warns against this procedure.

2. The AEL for the Band-It kit lists the new strapping container. The container will hold 1/2" strapping neatly in a coil and even has a place to put the exposed cut edges. A manufacture of the canister redesigned the dispenser and incorporated a solid center to increase the durability of the canister. The strapping material will not dispense properly from this type and should be returned to supply with a QDR identifying the problem. NAVSEA is working with the manufacture to get it changed back to the movable center.

Strapping container information
Cost $6.50 w/o strapping, $43.38 with strapping
NSN 7520-01-420-4595 container w/o strapping
For 1/2" strapping

3. Remove sharp edges from strongbacks using a grinder or file.

4. The rubber sheet in the band-it kit is a MIL-R-6855C. It comes in a sheet 3 feet long, 3 foot wide and 1/8 inch thick. The MILSPEC number is stamped on the rubber for easy identification. Cut the rubber in various sizes to help store the rubber.

5. Many strongbacks do not have the size marked on the strongback. In a casualty situation it

would be very time consuming to try to figure out which is which and detrimental if the wrong one was used. You may even want to put weld beads on the back of the strong back since in a flooding casualty the likelihood of losing power is very great. Put 2 beads on the back of a 2" strongback, 3 on the 3", and 4 on the 4".

6. Recommend placing buckles in 4 small zip-lock bags, 25 in each bag, with an inventory card stating how many buckles are in the bag. Seal the zip-lock bag around all edges with duct tape; be sure to leave a tab sticking out to allow ease of opening as needed. This will ensure that no one has broken into the bag and acts as a tamper seal. This method of storage keeps the bag neat, allows distribution of buckles to multiple casualty areas, and helps when inventorying the bag.

7. Three-quarter inch strapping is no longer used on submarines and should not be in the Band-it kits.

8. Cut resistant gloves mean exactly what it says, cut resistant not cut proof. Do not try to check the cut resistance of the gloves by using a knife on them, your hand will lose.

9. One-half inch strapping minimum breaking strength is 1500 lbs. Should be more than enough for any repair needed.

10. Be sure the Band-it tool has a mechanical stop at the end of travel of the threaded rod. This stop should either be a snap ring in the slot provided or by peening over the threads. The last thing you want in a casualty is to lose the handle in the bilge. Even if you have a snap ring on the tool you may want to remove it and peen the threads since the snap rings are easily displaced from the tool.

11. Store the chain wrenches with the thumbnut screwed all the way in till the wrench closes snugly. This does two things, it keeps the wrench from coming apart at the pivot bar and it keeps the bag neater and easier to maintain.

References:

Cut resistant gloves (large)	4220-01-397-7349
Cut resistant gloves (medium)	4220-01-397-7348
AEL 2-880043002	

HRDC 16: MATERIAL BAGS

Basic problem:

1. Material Bag does not contain all items listed on the AEL.

2. Hard wood wedges are substituted for soft wood wedges.

Hazards:

Recommended items are not available to combat a casualty.

Remarks:

1. Soft wood plugs and wedges are shipped with a wax sealer to prevent deterioration; this wax covering must be removed prior to placing in bags for ready use. To remove the wax coating first scrape the plug with a knife, then sand with a coarse grit sand paper.

2. Hard wood wedges are inadvertently substituted for soft wood wedges. Hard wood wedges can be identified by green paint on the butt end of the wedge unless the butt end was removed to make a smaller plug. Do not use hard wood wedges in material bags. Plugging wedges and conical plugs are made of softwood such as Fir, Balsam Fir, Cottonwood, Poplar, Willow, White cedar, Spruce, and Sugar, White, or Ponderosa pine. The softwood allows water to enter the grain quickly causing it to swell, stopping the leak.

3. The rubber sheet in the material bag is a MIL-R-6855C. It comes in a sheet 3 feet long, 3 foot wide and 1/8 inch thick. The MILSPEC number is stamped on the rubber for easy identification. Cut the rubber in various sizes to help store the rubber. One sheet's worth is all that is required.

4. The amount of lead sheet required was reduced sometime back. A bag requires one sheet 12"x16". Remember that lead is a Heavy Metal Hazardous Material, a poison, and can cause serious health hazards if not treated as such. Use extreme care when cutting the lead from the order quantity to the size required for the bag. DO NOT INJEST LEAD PARTICLES OR AIRBORNE PARTICULATE. Be sure to bag the lead before putting in the material bag and use gloves when handling lead.

References:

Lead Sheet 9535-00-232-7493
AEL 2-880043003

HRDC 17: PHOTOLUMINESCENT MARKING SYSTEM

Basic Problem:

1. Ships do not have damage control equipment or egress routes identified with light emitting tape.

Hazards:

Difficulty locating essential equipment.

Difficulty identifying your present location in a smoke filled or darkened compartment.

Remarks:

1. When was the last time you tried to locate a specific piece of Damage Control gear in the dark, or perhaps find your way around a darkened ship? I can assure you that when the lights go out; there is nothing darker than the inside of a submarine hull. For the experienced submariner, there are the familiar "landmarks" with which to carefully navigate. What about the new guy that just reported aboard, what awaits in his future? How will he find the way to safety?

2. In July 1990 SUBLANT released an A&I (N&B-1996, T0071) that required the use of photoluminescent paints to identify damage control gear and egress routes. The paint was hard to apply, was not durable, and took many man-hours to install.

3. In May 1994 SUBLANT released an updated A&I (N-3104, T-0089) identifying the use of tape in place of the paint. The tape was identified to resolve installation problems, poor durability, and excessive man-hours associated with the use of photoluminescent paint.

4. In April 1998 NAVSEA released a letter stating that the materials for photoluminescent marking will come from the U.S. Navy Shipboard Damage Control Photoluminescent Label Catalog by 3M Company.

5. To acquire items required by the A&Is use the catalog from 3M Company and follow the order directions listed in the catalog to open purchase these items. To obtain ordering information or the catalog call 3M at 1(800) 553-1380.

References:

NAVSEA Letter 9664 Ser 03G1/47 dtd 20 APR 98
CSL/CSP A&I N-3104/T0089
CSL/CSP A&I B/N-1996/TZ-0071, Trident
NSTM, CHAPTER 079/V2
NSTM, CHAPTER 634

HRDC 18: PORTABLE SUBMERSIBLE PUMP

Basic problem:

1. Foot valve will not operate, lacks PMS, greasing and cleaning.

2. Correct tending line not used or no tending line attached or attached incorrectly.

3. Pumps not flushed properly after pumping seawater.

4. Pump not electrically safety checked at proper intervals and cable is cut or pulled past compression fitting, exposing wiring.

5. Personnel do not wear rubber gloves when handling and operating the portable submersible pump.

Hazards:

Personal injury/electric shock.
Inability to dewater space properly in a casualty.

Remarks:

1. The foot valve is an important part of this pump configuration. Often times we find it extremely dirty and poorly lubricated. The most neglected and most susceptible location to the above problems is the escape trunk stowage on 688-class submarine due to the heavy traffic. Keep your foot valve clean and well lubricated. Store the valve in a spare EAB bag to maintain it in peak operating condition.

2. All portable submersible pumps require a handling line. The handling line is used to raise/lower the pump into areas that need dewatering, the power cord can not handle the strain exerted from the weight of the pump and will pull out of the connection causing a short, electrical shock hazard. Attach the handling line to both pad eyes on top of the pump via a bridle; **do not connect the handling line to the cable**. The line must be 2" double braid line. The proper line comes in rolls of 600 ft and should be cut to a minimum length of 30 feet for SSNs and 50 feet for SSBNs. The stock number to order the line is NSN 4020-00-106-9402. Submit a 2-kilo to have the IMA manufacture the line for you.

3. After using the pump to move seawater be sure to flush the pump IAW PMS requirements MRC 6641/R-13. The corrosive nature of salt water will corrode and destroy your pump in no time if a proper flush is not performed.

4. Perform electrical safety checks on this equipment at least semi-annually. Confirm you have the proper fuse clips and fuses in the control box.

References:

Fuse Clips NSN 5999-00-789-3049
AEL 2-470004047 (Pump Portable Submersible)
AEL 017710005 (Pump PRTL SBMRBL 5 HP 440V AC 180GPM 50FT Head)
AEL 017710001 (Pump PRTL SBMRBL 5 HP 440V AC 140GPM 70FT Head)
AEL 174754577 (Electric Motor, 115v, .333HP, 3450RPM)
AEL 174660371 (Electric Motor, 115v, .25HP, 3450RPM)
AEL 159990010 (Starter Motor, 450v, 1SPD, 1WDG WT)
AEL 2-620014077 (Cable Ass'y Triple Outlet AC)
AEL 2-470004041 (Pump PRTL SBMBL Bronze)
AEL 2-470004030 (Pump PRTL SBMRBL Non-magnetic)
AEL 2-470004007 (Pump SBMRBL ACCY 2 1-2)
AEL 8-470003003 (Pump SBMRBL ACCY 1 1-2in)
MIP 6641/A-9, R-13

HRDC 19: RED DEVIL BLOWERS

Basic problem:

1. Parts frequently missing.

2. Equipment not electrically safety checked.

3. Damage control Red Devil Blowers used for non-casualty situations

Hazards:

With screens missing the rotating blade becomes a hazard to personnel.

Remarks:

1. A submarine may carry 3 blowers on board. Two blowers are only used for damage control, for temporary ventilation or de-smoking spaces. Do not use the D.C. blowers for non-casualty situations.

2. Blowers are fitted with 8-inch diameter non-collapsible hose. Airflow is greatly reduced when there are bends in the hose. Each 90-degree bend is equivalent to adding 40 feet of hose. Keep the hose as straight as possible. For long distances or areas requiring numerous bends, place blowers in series equally spaced along the length of the hose.

3. The best performance is attained with the blower taking direct suction on the space being ventilated and exhausting into the hose.

4. It should be noted that while these motors are explosion proof when assembled at the factory, the explosion proof quality might not be present after overhaul of the motor. If the lock wire and labels are not present on the blower then do not use in an explosive atmosphere.

5. NAVSEA developed a procedure to manufacture a cover for the hose end screen. The cover protects it when stowed in a location such as on 688 class submarines where the screen can get smashed or damaged. The procedure is an enclosure to NAVSEA letter N407/3245 from 03G1/30 dated 26 Apr 94.

5. There have been many questions about how to obtain parts for the Red Devil Blower. Here are some hard to find stock numbers.

Whole Blower	4140-00-267-0967
Inlet Bell w/ Screen	4140-01-204-2799
Nose Cone	4140-01-130-2354
Hose End Screen	4140-01-344-5368
Elephant Trunk	4720-00-277-7225

6. Remember the IMA can repair, replace, and recertify explosion proof blowers. Replace damage screens as soon as noted, before parts become missile hazards or seize the blower.

References:

AEL 2-380044060
APL 400130001
Blowers Inc. drawing 5001-3E