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Commander, Naval Surface Forces
San Diego, CA 92155-5490

COMNAVSURFORINST 3541.1
CNSF N7
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COMNAVSURFORINST 3541.1

Subj: STANDARD REPAIR PARTY MANUAL FOR NAVAL SURFACE FORCE

Ref: (a) OPNAVINST 3120.32 Standard Organization and Regulations of the U.S. Navy (SORM)
(b) NWP 3-20.31(series) Surface Ship Survivability
(c) NSTM Chapter 555, V1, Surface Ship Firefighting
(d) NSTM Chapter 079, V1, Damage Control Stability and Buoyancy
(e) NSTM Chapter 079, V2, Practical Damage Control
(f) NSTM Chapter 079, V3, Damage Control Engineering Casualty Control
(g) NSTM 300, Electric Plant - General
(h) NSTM 320, Electric Power Distribution Systems
(i) NSTM 470, Shipboard Biological Warfare/Chemical Warfare Defense and Countermeasures
(j) COMNAVSURFORINST 3502.1, Surface Force Training Manual
(k) NAVMED P-5041, Treatment of Chemical Agent Casualties and Conventional Military Chemical Injuries
(l) Ship's Damage Control Book
(m) Ship's Damage Control Plates (Diagrams)

1. Purpose. To issue the Surface Force Repair Party Manual for COMNAVSURFLANT/COMNAVSURFPAC ships.

2. Cancellation. COMNAVSURFLANTINST 3541.1C/COMNAVSURFPACINST 3541.4B COMNAVSURFLANT/COMNAVSURFPAC Repair Party Manual.

3. Scope. The COMNAVSURFLANT/COMNAVSURFPAC Repair Party Manual provides standardized policy and guidance for shipboard damage control parties and is applicable to all ships of the Force. References (a) through (m) provide the basis for this manual. Pertinent references are listed at the beginning of each chapter. This is a complete revision and individual paragraph changes are not marked.

4. Revision. Complete revision, review in its entirety and at least annually there after.

5. Methodology. This document was developed to provide policy on damage control matters and to serve as a guide that directs the user to the "why" behind prescribed procedures.

6. Action. This instruction becomes effective as a ship's instruction after completion of the following (complete with in 60 days from the effective date of the instruction):

a. Ship specific information is tabulated and inserted where required.

b. Required ship-specific policies as listed in Chapter 1, Section 2 are established and inserted into its respective tab.

c. The Commanding Officer (CO) issues this manual as a ship's instruction by letter.

d. At least one copy of this manual shall be distributed to and maintained in Damage Control Central (DCC), each Damage Control Repair Station (DCRS) and each command and control station.

7. No changes shall be made to provisions and intent of this manual except as noted in paragraph 6a above. The CO is authorized to augment this manual to assist in the overall continuity pertaining to the individual ship. The CO is authorized to insert ship specific information in the areas annotated in this instruction. The Repair Party Manual (RPM) is designed solely as a reference for the ship, but not the sole reference. It should either answer or direct the user to the answer for most DC questions.

//SIGNED//
M. W. BALMERT
Deputy and
Chief of Staff

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CHAPTER 1 DAMAGE CONTROL ORGANIZATION AND RESPONSIBILITIES

SECTION 1 FUNDAMENTAL PRECEPTS

- Ref: (a) OPNAVINST 3120.32 Standard Organization and Regulations of the U.S. Navy (SORM)
- (b) NWP 3-20.31 (Series), Surface Ship Survivability
- (c) NSTM Chapter 555, V1, Shipboard Firefighting
- (d) NSTM Chapter 079, V2, Practical Damage Control
- (e) NSTM 470, Shipboard Biological Warfare/Chemical Warfare Defense and Countermeasures.
- (f) .COMNAVSURFORINST 3502.1, Surface Force Training Manual
- (g) COMNAVSURFORINST 3540.3, Engineering Department Organization and Regulation Manual (EDORM)
- (h) Ships Loading Characteristics Pamphlet
- (i). OPNAV INSTRUCTION 3500.34

1100 DAMAGE CONTROL READINESS.

a. Effective leadership and a well-trained crew achieve Damage Control readiness. This includes all ranks, ratings, and departments. Central to success is heightened command attention on these matters. One of the most important aspects of damage control preparedness takes place before the damage occurs (with knowledge, training, and exercises). Effective damage control organizations routinely exercise and assess themselves.

b. Damage control is the responsibility of all hands aboard ship. The ship's ability to fulfill its mission depends upon its effectiveness. The survival of the ship depends upon prompt and correct damage control action.

c. Training should be based on a seminar, brief/execute, debrief, and follow-up methodology. By using this approach, personnel gain knowledge and develop the skills and teamwork needed to successfully combat any damage.

d. It is vitally important that a strong training program is in place to educate and train the entire ship's company for all possible damage situations. Education, training, organization and maintenance are the fundamentals of damage control and are applicable to all ships irrespective of type or size.

e. The CO is responsible for adherence to, and the effective application of, the principles and standards established in this and all damage control publications. These standards are the minimum; they should not restrict the CO's decision to take additional action to control damage. Listed below are some basic tenets of damage control.

- (1) Keep your ship watertight.
- (2) Do not violate material conditions.
- (3) Have confidence in your ship's ability to withstand severe damage.
- (4) Know your way around your ship even in the dark.
- (5) Know how to use and maintain damage control equipment.
- (6) Report damage to the nearest damage control station.
- (7) Keep personal articles properly secured at all times.
- (8) Practice personal damage control; protect yourself so you can protect the ship.
- (9) Take every possible step to save the ship as long as a bit of hope remains.
- (10) Keep cool - don't give up the ship.

1101 DAMAGE CONTROL COMMAND POLICIES.

a. Commands shall promulgate in this document policies that impact damage control readiness and insert in Tab A. Such topics, policies, or practices include (but are not limited to):

b. When will modified Zebra be set? (Mod Zebra fittings will be listed in Chapter 5 Tab C).

c. Who responds inport while the main engineering plant is in operation? Day? Night? (Inport Emergency Team [IET], General Quarters or Condition II DC?) What about the auxiliary plant?

d. When is it permissible to discharge oily waste/AFFF overboard? What constitutes an emergency?

e. Who authorizes the placing of Damage Control systems out of commission? How many systems at once?

f. Is there a preferred method for re-entering a main space during fire fighting operations?

g. What tripwires, if any, are there for personnel in command positions (Executive Officer, Command Duty Officer) for flooding a magazine? Using main eductors inport?

h. How will the IET be augmented in homeport?

i. Where do the members of the training team go during an actual casualty?

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SECTION 2 REQUIRED INFORMATION

1200 SHIP SPECIFIC POLICIES.

a. The following ship specific policies must be established and inserted into the Repair Party Manual:

- (1) Strip Ship Bill (CHAPTER 5 TAB A)
- (2) Jettison Bill (CHAPTER 5 TAB B)
- (3) Casualty Power Bill (CHAPTER 6 TAB A)
- (4) Main Space Fire Doctrine (CHAPTER 4 TAB E)
- (5) CBR-D Bill (CHAPTER 7 TAB A)
- (6) Toxic Gas Bill (CHAPTER 4 TAB J)
- (7) Modified Zebra Bill (CHAPTER 5 TAB C)

1201 REQUIRED CHAPTER TABS:

- a. TAB A, Command Polices (p 19).
- b. TAB B, Condition I Damage Control Order of Succession (p 20).
- c. TAB C, Flying Squad Organization (p 21).
- d. TAB D, DC Communication Plan (p 22).
- e. TAB E, Dmage Control Repair Station Organization Chart (p 23).
- f. TAB F, Alternate Repair Party Mustering Locations (p 24).
- g. TAB G, DCRS Inventory/Shortages (p 25).
- h. TAB H, Damage Control Command and Control Organizational Chart (p 26).
- i. TAB I, IET Manning Chart (p 27).
- j. TAB J, Rescue and Assistance Detail Manning (Inport/Underway) (p 28).

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SECTION 3 GENERAL REQUIREMENTS

1300 COMMAND AUTHORITY.

a. Authority to Sprinkle/Flood Magazines. The CO shall publish, as ship's policy, who has the authority to order the sprinkling of magazines. The policy should distinguish between fires in a magazine and fires in compartments adjacent to a magazine. The decision to flood a magazine can have serious consequences on damage control efforts. The person authorized to exercise command authority shall make this decision.

b. Damage Control Measures Requiring Command Approval. Damage control items requiring command approval are listed in reference (b).

1301 REQUIRED DAMAGE CONTROL CENTRAL EQUIPMENT, MATERIALS AND PUBLICATIONS.

a. Certain damage control items shall be maintained by the DCA. Many are listed in the references and are required to be part of the Damage Control Library. Items that are required and are not listed in any reference are listed below. The DCA shall maintain the following items:

b. Updated liquid loading status to reflect the latest tank and void soundings provided by the Oil King and the Sounding and Security Watch.

c. Clinometers to determine list and trim.

d. AN/PDR-65 High Range Survey Meter (may only be available on Bridge)

e. Tank sequencing chart and/or tables.

f. The non-propulsion tag out log, if separate from the engineering tag out log, shall be used to tag out any major damage control systems (e.g., firemain or fittings or any procedures affecting stability or involving hot work reference (d)).

g. Lists of preplanned routes to deep shelter, combat systems equipment casualty control supply support centers, battle dressing stations, battle messing, and other battle logistics supply centers or storerooms.

h. Charts, nomograms and other required materials to calculate various radiological factors.

i. Repair Party Manual with complete Chapter Tabs.

j. COMNAVSURFOR publishes serialized Damage Control Readiness Advisories (DCRA) to provide prompt dissemination of information, policies, or procedures not available in other references. DCRAs will be recorded on the Index of Damage Control Readiness Advisory page and filed for reference and continuity behind the Index of Readiness Advisories page of this instruction. All DCRAs when received, shall be distributed to all applicable personnel for information purposes. DCRAs are available for download on the COMNAVSURFPAC or COMNAVSURFLANT web site.

k. Ship's Loading Characteristic Pamphlet (SLCP) for Amphibious Ships.

1302 DAMAGE CONTROL CENTRAL SUCCESSION.

a. Provisions must be made for the functions of Damage Control Central (DCC) to be carried out by other stations if DCC needs to be evacuated. Most ships are built with the Damage Control Repair Station (DCRS) furthest from DCC having most of the interior communications circuits necessary to be a secondary DCC. A major conflagration will disrupt the repair organization and may require reorganization topside. The Damage Control Assistant (DCA) shall make provisions to provide the topside location with a copy of the completed Repair Party Manual (RPM) and damage control plates for plotting and evaluating damage. The succession of DCC on each ship and the designated topside space shall be annotated in the RPM Chapter 1 Tab B (complete as many as necessary).

1303 DUPLICATE DC MATERIALS FOR COMMAND AND CONTROL.

a. To ensure the CO/CDO is aware of and can better visualize the damage control situation, a duplicate set of up-to-date damage control plates showing the hull, all decks, and

compartments will be provided to any space the CO designates as a command and control station (damage control subdivision plates 2 and 3).

b. The plates need not be permanently mounted or hard laminated like those in DCC. Because of space considerations, they may be cut down or modified as appropriate so long as they remain functional.

c. A copy of the RPM complete with chapter tabs shall also be provided to all command and control stations.

1304 DCRS INVENTORIES.

a. DCRS inventories shall be in accordance with the ship's Allowance Equipage Lists (AEL) or Damage Control - Operating Space Item Management System (DC-OSIMS) Program (PMS 400F3). A paper copy of the ship's current DCRS AEL(s) shall be available to personnel conducting inventories per reference (b). A current DC-OSIMS shortage list shall be maintained in each DCRS's RPM Chapter 1 Tab G:

- b. Ships with a modified DCRS use AEL: 2-880044200.
- c. Ships with one DCRS use AEL: 2-880044201
- d. Ships with two DCRS use AEL: 2-880044202
- e. Ships with three DCRS use AEL: 2-880044203
- f. Ships with four DCRS use AEL: 2-880044204
- g. Ships with five DCRS use AEL: 2-880044205
- h. Ships with six DCRS use AEL: 2-880044206
- i. Ships with seven DCRS use AEL: 2-880044207
- j. Ships with eight DCRS use 2-880044208 & 2-880044209
- k. Ships with nine DCRS use 2-880044219 & 2-880044220
- l. Ships with ten DCRS use 2-880044210 & 2-880044211

(1) To assist in inventories, ships are encouraged to use the following:

(a) Inventory Aid Booklet for Damage Control Equipment (NAVSEA S5090-BL-DCB-010).

(b) Stowage Aid Booklet for Damage Control Equipment (NAVSEA S5090-B1-MMO-010).

(2) As much as possible, the equipment should be distributed throughout the DCRS's designated area of responsibility via spread stowage as per reference (b).

SECTION 4 DAMAGE CONTROL ORGANIZATION

1400 DC ORGANIZATION.

a. Damage Control Organization. The concept behind the changes to the damage control organization is to allow the ship to continue its tactical mission while responding to a casualty in a tiered approach. The tiered response allows the CO the ability to utilize resources more efficiently. Tiered response consists of three layers: Flying Squad, Condition II Damage Control, and General Quarters.

b. Flying Squad shall consist of, at a minimum (see references b, c and d for duties and responsibilities):

1. Fire Marshall¹
2. Electrician¹
3. Rapid Responders^{1,2} (2)
4. Scene Leader³
5. Team Leader³
6. Team Members^{2,3} (3)
7. Investigators³ (2)

NOTE:

¹ Rapid Response Team - Shall report directly to the scene.

² Shall be PQS qualified up to DC 308.

³ Back up Team - Shall report to the designated DCRS.

() Denotes the number of personnel required.

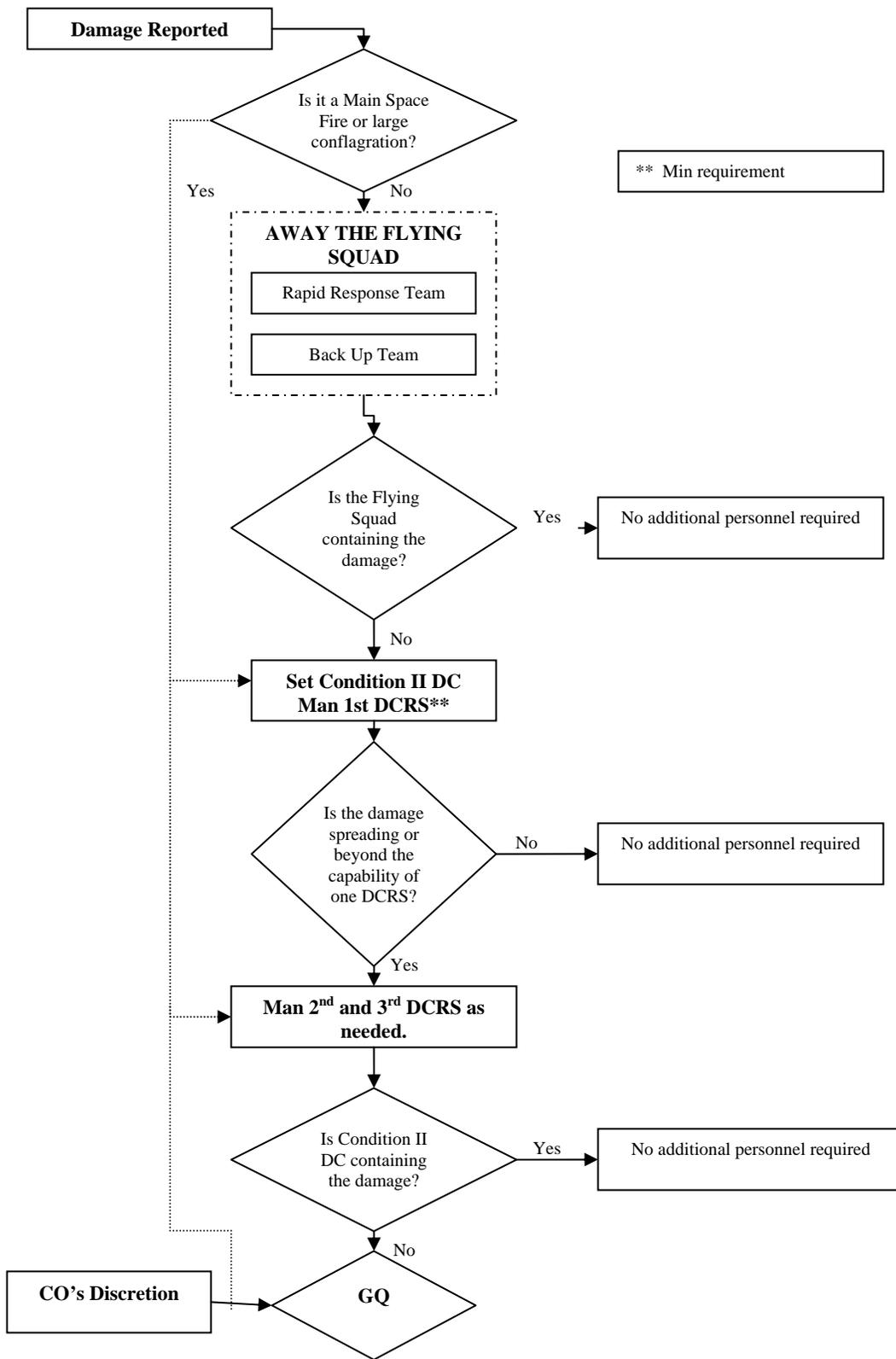
Plotter and talker/messenger functions listed in reference (b) may be performed by non-Flying Squad personnel on watch in control stations.

c. Condition II Damage Control allows a significant increase in Damage Control response without disrupting tactical watchstations. This provides the Commanding Officer a multi-tiered response to combat damage. Designated Damage Control Repair Stations (DCRS) and DC Central shall be manned up when Condition II DC is set. At a minimum, one DCRS and one Battle Dressing Stations (BDS) shall be manned. For example, when Condition II DC is called, Repair 5 is manned with Repair 5 personnel. As the damage becomes bigger, an additional DCRS is manned. This allows flexibility for additional DCRS to man up if required (see Figure 1). Primary boundaries, such as fire, smoke and/or flooding, shall be set as required.

d. General Quarters (GQ) will be set for tactical reasons or as deemed necessary by the CO, ref h applies. Material condition Zebra shall be set during GQ.

e. Functional requirements for individual DCRS shall be IAW reference (b).

Table 1 - DC ORGANIZATION FLOW CHART



1401 CONCEPT.

a. The Flying Squad's purpose is to quickly respond to casualties and determine the extent of damage. Designated initial responders will proceed directly to the scene of damage while the rest of the Flying Squad provides from designated DCRS. The actions required for a larger casualty or a change in threat level would drive the ship to Condition II DC. Condition II DC allows the CO flexibility to fight the ship with a tiered DC response without disrupting tactical watchstations. The CO retains the option of setting GQ.

1402 IET ORGANIZATION.

a. The CO will develop an IET that is an effective fire fighting force considering current circumstances (including machinery space fires). This team must also be capable of effectively controlling flooding and its possible effects, as well as any other condition described in the General Emergency Bill (insert into Tab I). See reference (b), chapters 2 and 9.

NOTE: The term "circumstances" will include considerations for cold iron, cold iron with flammable liquid systems running, auxiliary steaming and operation of main engines.

b. For units with fewer than three DCRS's (MHC/MCM/PC): While at home port the IET may be comprised of ship's force backed up by members of the Base Fire Department or Rescue and Assistance Teams from surrounding ships inport.

c. For units with three or more DCRS's: The requirement for the inport fire party is listed in reference (b).

d. During working hours inport, the Flying Squad shall respond to any shipboard casualty. The duty section IET will serve as a back up. Upon liberty call, emergency response will be turned over to the IET until the start of the following workday.

1403 RESCUE AND ASSISTANCE DETAIL (R&A).

a. The Rescue and Assistance Detail shall maintain the functional capabilities listed in reference (b). Personnel will be taken from the IET (inport). Underway, the R&A team shall be as described in reference (b). When the decision to deploy an R&A detail is made, the possible degradation of the damage control readiness of the ship providing assistance must be carefully considered. Own ship's safety and security are the primary concerns. The R&A detail shall be event specific, that is, only those functions appropriate to a particular casualty will be dispatched. For example: for flooding, the ship would dispatch a de-watering team and a plugging team; for a small fire dispatch a hose team; etc.

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SECTION 5 DAMAGE CONTROL TRAINING

1500 SHIPBOARD DAMAGE CONTROL TRAINING SPECIALISTS.

a. NEC-4805 Shipboard Chemical, Biological and Radiological-Defense (CBR-D) Operations and Training Specialists. Responsibilities include:

(1) Conduct training on shipboard CBR-D.

(2) Advise the CO on how to integrate CBR-D preparation, defense and recovery into the normal command organization.\

(3) Supervise and perform shipboard organizational level maintenance on CBR-D equipment.

b. NEC-4811 Senior Enlisted Damage Control Program Management and Training Specialists. Responsibilities include:

(1) Perform managerial and safety supervisor functions in support of Damage Control (DC), Fire Fighting (FF) and CBR-D programs.

(2) Perform duties as the ship's DC, FF and CBR-D subject matter experts and are responsible for shipboard DC/FF/CBR-D equipment maintenance and quality assurance.

(3) Troubleshoot installed fire fighting systems.

(4) Assist the DCA in organizing and training the ship's damage control and fire fighting teams.

(5) Plan and evaluate DC/FF/CBR-D exercises.

(6) Act as the ship's Assistant Gas Free Engineer.

c. Damage Control Training Team (DCTT). All ships shall have a designated DCTT. It shall provide effective training to the ship's crew on all types of DC casualties listed in reference (j). For additional guidance and requirements see reference (b)

d. Required Fire Fighting Team Training conducted IAW with reference (f). All Hands General DC PQS Training. The DCA will monitor and ensure that all ship-wide general damage control PQS meet the requirements set forth in reference (a).

e. GENERAL. COMNAVSURFOR will publish serialized Damage Control Readiness Advisories (DCRA) to provide prompt dissemination of information, policies, or procedures. DCRA will be recorded on the Index of Damage Control Readiness Advisories page and filed for reference and continuity behind the Index of Readiness Advisories page of this instruction. All DCRA's when received, shall be distributed to all applicable personnel for information purposes.

TAB A - COMMAND POLICES

- a. When will modified-Zebra be set? (Mod Zebra fittings will be listed in Chapter 5 Tab C).
- b. Who responds inport while the main engineering plant is in operation? Day? Night? (IET, General Quarters or Condition II) What about the auxiliary plant?
- c. When is it permissible to discharge oily waste/AFFF overboard? What constitutes an emergency?
- d. Who authorizes the placing of Damage Control systems out of commission? How many systems at once?
- e. Is there a preferred method for re-entering a main space during fire fighting operations?
- f. What tripwires, if any, are there for personnel in command positions (Executive Officer, Command Duty Officer) for flooding a magazine? Using main eductors inport?
- g. How will the IET be augmented while in homeport?
- h. Where do the members of the training team go during an actual casualty?

TAB B - CONDITION I DAMAGE CONTROL STATION ORDER OF SUCCESSION

NOTE: In the case of Condition II DC order of succession is the same as Condition I.

First Alternate DCC

Second Alternate DCC

Third Alternate DCC

TAB C - FLYING SQUAD ORGANIZATION

See reference (b) for requirements of the Flying Squad.

TAB D - DC COMMUNICATION PLAN

From/To	Primary	Secondary	Tertiary
---------	---------	-----------	----------

TAB E - DAMAGE CONTROL REPAIR STATION ORGANIZATION CHART

See reference (b), chapters 2 and 9.

TAB F - ALTERNATE REPAIR PARTY MUSTERING LOCATIONS

Consider accessibility to Damage Control Equipment and other assets, as well as location of fire/damage.

TAB G - DCRS INVENTORY/SHORTAGES

Insert copies of DC OSIMS inventory and shortage lists that are applicable to the DCRS and area of responsibility.

TAB H - DAMAGE CONTROL COMMAND AND CONTROL ORGANIZATIONAL CHART

See reference (b).

TAB I - IET MANNING CHART

See reference (b).

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TAB J - RESCUE AND ASSISTANCE DETAIL MANNING (INPORT/UNDERWAY)

See reference (b).

CHAPTER 2 - INVESTIGATING DAMAGE

SECTION 1 - REQUIRED INFORMATION

Ref: (a) NSTM Chapter 079, V2, Practical Damage Control
(b) NSTM Chapter 555, V1, Surface Ship Firefighting

2100 REQUIRED CHAPTER TAB.

a. TAB A, DCRS and Damage Control Unit Locker (DCUL) Areas of Responsibility. A sample is provided.

b. TAB B, Tanks and Voids. A sample is provided. A listing of all tanks and voids in each DCRS's area of responsibility, along with their access, sounding tube and air escape locations (if fitted).

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SECTION 2 - INVESTIGATING DAMAGE

2200 BASIC PRINCIPLES OF INVESTIGATION.

a. These principles are listed in ref (a) and are based on investigators knowing their areas of responsibility. Pre-determined investigator routes have proven worthwhile, but are not required.

2201 INVESTIGATOR REQUIREMENTS:

a. Travel in pairs so one investigator can report damage or casualties while the other takes initial actions.

b. Wear an OBA/SCBA (activate when required). Anti-flash gear, helmet and long sleeves must always be worn IAW ref (b). CBR protective mask and inflatable life vest need not be worn, but must be assigned and readily available in the DCRS or vicinity.

c. Investigators shall carry only the equipment deemed necessary, based on initial response, to conduct investigations. The investigator kit is designed to respond to all types of damage investigations, and if carried in its entirety will slow down the investigation process. The kit may be broken down into sub-kits for investigating during specific casualties. However, these kits, when combined, must include all equipment listed on the applicable AEL.

d. Investigators will be familiar with Chapter 2, Tabs A, (DCRS Areas of Responsibilities) and B (Tanks and Voids location).

2202 INVESTIGATION PROCEDURES

a. Investigators shall be familiar investigating procedure of chapter 40 of reference (a).

b. Personnel in manned spaces shall conduct investigation on station and report results to the cognizant supervisory watch station, which in turn shall report results to DCC. Investigators will concentrate on unmanned spaces.

c. The inspection for damage must not be confined to the primary damage area. Inspect outward from the damaged area and along the projectile path, if applicable.

d. Ship system damage reports must pinpoint the system affected and damage location by frame. This will ensure that the required sections of the system are isolated with a minimal impact on the rest of the ship. The investigator shall be knowledgeable of all ship's systems that are in or traverse their areas of responsibility.

e. When investigating for underwater hull damage and flooding, it may be unwise to open a watertight closure to a potentially flooded space. To determine if the space is flooded:

(1) Check for condensation on adjacent bulkheads, if accessible.

(2) Tap on the bulkhead a minimum of six inches from welds with a dogging wrench or similar object, listening for a distinct change in the echo tone.

(3) Carefully loosen air test fittings/sounding tubes, if provided, remembering to tighten when done.

NOTE: Caution must be exercised in the removal of sounding tube caps. Back the cap off slowly while listening for rushing air and looking for trickling water from the threads; either symptom may indicate the tank or void is open to the sea. Rushing air might also indicate fire, as oxygen is being sucked into the space to feed it.

(4) Check air escape/vents, remembering that they may be located several decks above the damaged space.

f. When underwater hull damage is found or suspected, all tanks and voids should be sounded and compared with the pre-damage soundings. The closest tanks and voids to the suspected damage should be sounded first, but underwater structural damage may not necessarily be confined to the area adjacent to the damage.

g. Indications of possible damage are listed in reference (a).

h. Use the Navy Firefighter Thermal Imager (NFTI) because it is an infrared thermal-imaging device that helps to find heat sources. It may be used for the following:

- (1) Navigating through smoke filled compartments.
- (2) Locating the source or seat of the fire.
- (3) Finding personnel casualties.
- (4) Locating hot spots on bulkheads, decks, overheads and within ventilation ducting.

Note: Ventilation systems can be a primary path for fire spread and must be checked early and often.

NOTE: Investigators may also use a "Fire Finder," if available.

2203 DAMAGE CONTROL WIREFREE COMMUNICATIONS (DC WIFCOM/ HYDRA/ SIWCS) SYSTEMS.

a. Emission Control (EMCON) considerations. All handheld wireless radios (e.g. DC WIFCOM, HYDRA and SIWCS emit radio frequency (RF) signals that can be detected. Therefore, use of any of these types of radios must be addressed in the ship's EMCON plan.

b. Hazardous Electromagnetic Radiation to Ordnance (HERO). For safety reasons, wireless communications systems generally shall not be used during weapons handling evolutions. Specifically, portable radios shall not be used closer than 10 feet of HERO susceptible or unsafe ordnance, especially in the presence of any damaged, broken, or otherwise exposed explosives.

c. Maintaining communication records. The use of handheld wireless radios eliminates the need for the scene leader and investigators to use message blanks. Reports received in the DCRS shall be recorded on message blanks or logbooks to be used for both plotting and maintaining a record of communications in support of subsequent locker leader decisions.

....d. Maintaining Proficiency in Writing Messages. The writing of message blanks is a fundamental damage control skill that must not be lost. Scene leaders, investigators and other handheld, wireless radio users must continue to train in message

writing to stay proficient and prepare for scenarios involving a complete loss of wireless communications.

TAB A - DCRS AND DCUL AREAS OF RESPONSIBILITY

DCRS TWO

1. AREA OF RESPONSIBILITY - Forepeak to Fr. 67, all decks; Fr. 69 FWD main deck and above.
2. LOCATION OF DCRS - 2-51-1-A

<u>COMPARTMENT NO.</u>	<u>COMPARTMENT NAME</u>	<u>LOCKED</u>
2-5-0-E	Anchor Windless Room	NO
1-54-0-A	ASROC Storeroom	YES
2-54-01-L	Degaussing Equip. Room	YES

Note: Spaces that are normally locked (e.g., Store rooms, Offices, Staterooms etc.) and unmanned during General Quarters should be annotated to aid the RPL and Investigators. Divisions responsible for locked spaces shall post a sign at the entry point stating who maintains keys to the space.

TAB B - TANKS AND VOIDS

DCRS 5

TANK VOID	MANHOLE ACCESS	SOUNDING TUBE	SOUNDING TUBE	FIRESCAPE VENT
<u>NUMBER</u>	<u>LOCATION</u>	<u>NUMBER</u>	<u>LOCATION</u>	<u>LOCATION</u>
5-204-2-F	2-205-2 2-180-4-L	2-209-2	2-180-4-L	MAIN DECK FR 176 PORT
5-260-1-F	5-278-1 5-230-0-E	1-269-2	1-212-0-L	MAIN DECK FR 255 STBD
5-308-1-W	3-324-1	3-308-1	5-292-0-E	1-278-1-L

CHAPTER 3 - COMPARTMENT ISOLATION

SECTION 1 - REQUIRED INFORMATION

Ref: (a) NSTM Chapter 555, V1, Surface Ship Firefighting

3100 REQUIRED CHAPTER TABS.

a. TAB A, Compartment Isolation Lists/Kill Cards. Prepared for each significant compartment in the DCRS's respective areas of responsibility, with copies maintained in DCC. Each isolation list shall identify:

- (1) Electrical. 440V/110V electrical loads
- (2) Mechanical
 - (a) All fuel/lube/hydraulic oil systems
 - (b) Compressed air systems
 - (c) Steam systems
 - (d) Chill water systems
 - (e) Firemain Isolation Valves
- (3) Ventilation
 - (a) Ventilation controllers: Supply, Exhaust and Recirculation.
 - (b) Natural ventilation closures
 - (c) Circle William fittings
- (4) Damage Control Equipment. Fire fighting equipment as required.
- (5) Hazardous Materials: Hazardous materials stored in each compartment.
- (6) Water, Air, and Oil tight Closures: Damage control closures in the compartment.

b. List individual items logically while considering its relative importance. A sample is provided in Chapter 3, TAB A.

NOTE: Main spaces covered by the Machinery Space Fire Fighting Doctrine need only be listed in Chapter 4.

NOTE: Electrical cables only passing through the space do not have to be listed. However, in the event of a cableway fire, cables must be traced and isolated.

NOTE: Compartment isolation lists shall be frequently verified/updated by DCRS/DCTT personnel during damage control drills and following significant maintenance periods.

SECTION 2 - COMPARTMENT ISOLATION

3200 COMPARTMENT ISOLATION CONSIDERATIONS.

a. Every effort should be made to secure and/or isolate systems and equipment that are the cause of a fire, have the potential to increase the intensity of a fire, or pose a safety hazard to repair personnel.

b. The isolation of all potentially hazardous systems in the affected space prior to entry is not necessarily required; each casualty must be evaluated individually based on the tactical situation.

c. When a space is abandoned because of fire, flooding, or other damage, the space should be mechanically and electrically isolated to the greatest extent possible under the circumstances. Priority must be given to isolating those systems, which pose the greatest hazard.

d. The CO may choose not to electrically isolate a damaged space, or selected equipment, for safety or tactical reasons. The decision not to electrically isolate must be clearly understood by repair personnel.

e. Fire fighting may start before electrical power is secured. If all power is not secured, the team leader should be aware of what circuits or equipment are still energized. It may be necessary for electrical power to be energized in order to effect mechanical isolation. Mechanical isolation is the priority.

f. The decision to secure lighting should be made by the scene leader. Reference (a), section 7, addresses other items to be considered such as hazards to fire fighting.

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TAB A - ISOLATION LIST/KILL CARD

COMPARTMENT NAME: _____

COMPARTMENT NUMBER: _____

ELECTRICAL ISOLATION

EQUIPMENT/SYSTEM	CIRCUIT ID NUM	BEAKER LOCATION(S)
1.LOAD CENTER 11	1S-3P-11	1-2-3-E/1-3-2-E
2.115 V OUTLETS	(3-45-2)-1P-C1P	3-45-2-L

MECHANICAL ISOLATION

PIPING	VALVE SYSTEM NUMBER	DAMAGE CONTROL NUMBER	VALVE LOCATION
1.MAIN DRAIN		5-107-2	5-170-0-E
2.F/O SUPPLY	FO-1		1-2-0-L
3.LP AIR	LPA-1		1-2-0-L

VENTILATION

VENTILATION	NUMBER	CONTROLLER LOCATION
1. SUPPLY	1-2-1	1-2-0-L
2. EXHAUST		
3. NATURAL		

DAMAGE CONTROL EQUIPMENT

EQUIPMENT NAME	FRAME	VLV/SWITCH NUM.	REMOTE OPERATOR
1. FIXED HALON	FR 10(P)	5 LB CO2 BOTTLE	2-30-2-L HALON STRM
2. 15LB C02 BTL	FR 3(S)	N/A	N/A
3. FIRE STATION	FR 8(S)	FPL 1-8-1	N/A
4. RAM FAN	FR 1	N/A	N/A

HAZARDOUS MATERIALS

STORAGE AREA	FRAME NUM.	CONTENTS
1. HAZMAT LOCKER	FR 5(P)	OILS (VARIOUS)

WATER, AIR, AND OIL TIGHT CLOSURES

CLOSURE TYPE	CLASSIFICATION	NUMBER	ACCESS TO
1. QAWTD	ZEBRA	1-12-0	1-12-2-L
2. WTD	YOKE	1-9-1	1-4-1-Q
3. ATC	X-RAY	1-8-1	TEST 1-4-1-Q

CHAPTER 4 - FIREFIGHTING

SECTION 1 - REQUIRED INFORMATION

- Ref: (a) OPNAVINST 3120.32 Standard Organization and Regulations of the U.S. Navy (SORM)
 (b) OPNAVINST 5100.19, Navy Occupational Safety and Health Program Manual for Forces Afloat
 (c) NWP 3-20.31, (series) Surface Ship Survivability
 (d) NSTM Chapter 555,V1, Surface Shipboard Firefighting
 (e) NSTM Chapter 079,V2, Practical Damage Control
 (f) NSTM Chapter 079,V3, Damage Control Engineering Casualty Control
 (g) Hazardous Material Information System (HMIS)
 (h) Ship's Damage Control Book
 (i) NAVAIR 00-80R-14 NATOPS U.S. Navy Aircraft Fire Fighting and Rescue Manual
 (j) NSTM Chapter 074, V3, Gas Free Engineering

4100 REQUIRED CHAPTER TABS FOR SECTION 2.

- a. TAB A, Firefighting Methods. The firefighting agents for each class of fire are listed in preferential order.
- b. TAB B, Repair Party Leader's (RPL) Firefighting Checklist. A sample format is enclosed. This checklist must be tailored by each ship for use by the DCA, Repair Party Leader, On Scene Leader and bridge/quarterdeck personnel.
- c. TAB C, Compartment Hazards. Per references (d) and (e), each DCRS shall have a listing of all hazards in all spaces including, but not limited to, hazardous material, flammable liquids, ammunition/pyrotechnics, industrial chemicals, industrial gases and any other items of concern to the repair party. They may be segregated according to the DCRS areas of responsibility.
- d. TAB D, Magazine Sprinkler Control Valves. Per reference (h), DCRSs will list by location all magazine sprinkler root/control valves in their area. A sample format is provided.

4101 REQUIRED CHAPTER TABS FOR SECTION 3

- a. TAB A, Actions For a Major Flammable Leak Underway. Per reference (d), list each step in the process.
- b. TAB B, Actions For a Major Flammable Leak Inport. Per reference (d), list each step in the process.
- c. TAB C, Underway Actions in Case of Class Bravo Fire. Per reference (d), list each step in the process.
- d. TAB D, Inport Actions in Case of Class Bravo Fire. Per reference (d), list each step in the process.
- e. TAB E, Fire Boundaries. Per references (d), (e) and (h), list by location each boundary to be set.
- f. TAB F, Smoke Boundaries. Per references (d), (e) and (h), list by location each boundary to be set.
- g. TAB G, Electrical Isolation. Per references (d), (e) and (h), list by location each item to be operated to isolate each space.
- h. TAB H, Mechanical Isolation. Per references (d), (e) and (h), list by location each item to be operated to isolate each space.
- i. TAB I, Ventilation System. Per references (d), (e) and (h), list by location all ventilation systems and controllers for each space.
- j. TAB J, De-watering From Outside The Space. Per references (d), (e) and (h), list by location and in sequence the valves and procedures to be used.
- k. TAB K, OBA canister/SCBA Change Out Area. Per references (d) and (g), list the procedures to be used for disposal of OBA canisters and EEED's.
- l. TAB L, Primary and Secondary Space Reentry Plan. Per reference (d), list by location all methods and procedures for entering each space.
- m. Tab M, De-Smoking Plan. Per references (d) and (e), list by location.

n. TAB N, Atmospheric Testing. Per reference (j), list all required test to be completed paying particular attention to substances in the shape.

o. TAB O, OBA/SCBA Relieving Procedures. Per reference (d), define the procedure to be used for relieving hose teams.

p. TAB P, Fixed CO2 Flooding Actuation Stations. Per references (d) and (h), list by location all fixed CO2 actuation stations, if applicable.

q. TAB Q, HALON Flooding Activation Stations. Per references (d) and (h), list by location all HALON actuation stations, if applicable.

r. TAB R, AFFF Stations. Per references (d) and (h), list by location all AFFF actuation stations, if applicable.

s. TAB S, Desmoking Procedure. Per references (c), (d) and (h) list desmoking procedures for all spaces.

t. TAB T, Toxic Gas Bill. Per reference (j) insert Toxic Gas Bill.

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SECTION 2 - FIREFIGHTING

4200 GENERAL SHIPBOARD FIREFIGHTING.

a. All hands must be concerned with fire prevention and aware of fire fighting tactics detailed in references (c) through (e). The major steps involved in shipboard fire fighting are: establishing communications; locating, reporting, containing and extinguishing the fire; and restoring from the casualty.

(1) Establishing communications with DC command and control. Time is critical when establishing DC communications. When designating DC command centers and mustering locations, consider the accessibility to quick and reliable communications systems.

(2) Locating the fire. Considerations for locating the fire include knowledge of the ventilation systems and employment of the Naval Firefighters Thermal Imager (NFTI). The discovery of smoke normally precedes the discovery of a fire. Therefore, personnel should be familiar with the ventilation systems and airflow path through their spaces to allow for a quicker response. The NFTI is an effective tool for locating the fire source; however, once inside the space, the thermal layer and high temperature can cause a "white out" condition requiring close adherence to procedures outlined in reference (d).

(3) Reporting the fire. Personnel must be trained to report the fire/smoke in the following manner:

- (a) Access the ship's emergency number.
- (b) Identify him/herself.
- (c) Report class of fire or color of smoke.
- (d) Give location (space noun name).
- (e) Give space's DC identification (compartment) number, if known.
- (f) If the space is tenable, return to the fire and initiate fire-fighting actions.
- (g) If it is untenable, isolate the space, break out fire fighting equipment and stand by in the area to brief the scene leader.
- (h) Make sure all personnel in the surrounding area are aware of the fire/smoke.

(4) Containing the fire. Lessons learned from shipboard fires have shown how spaces are most vulnerable to vertical fire spread; therefore, the topside fire boundary is paramount. Boundary men must be proactive in removing all combustibles from adjacent spaces, especially adjoining bulkheads. If the space has false decks, make sure all materials below the false deck are removed or wet down. One inch of water on deck may prevent fire spread even when the temperature of the space below is above 1000 degrees Fahrenheit.

(5) Extinguishing the fire. Put the fire out using the preferred agents listed in Section 2, TAB A. The Damage Control organization (DCA, RPL, and OSL) should consider the need to use indirect cooling (fire fighting) prior to using a direct attack, based on space tenability. Procedures for indirect fire fighting are addressed in reference (d).

(6) Systems restoration. The extent of damage usually determines the speed of casualty restoration. EOSS or other standard operating procedures should be used, where applicable. See reference (f) for equipment reconditioning.

4201 FIREFIGHTING GLASS REINFORCED PLASTIC (GRP) STRUCTURES.

a. Minesweepers (MCM) and mine hunters (MHC) use GRP for hull and structural components. Greater fire survivability has been achieved by installing mineral wool fire insulation on the bulkheads and in the overheads of vital spaces. Each side of the fire zone boundaries should also have this insulation. This non-toxic material will inhibit radiation and conduction of heat for 30 minutes without external cooling.

b. Fires in GRP boundary compartments will be easier to contain than those in conventional metal compartments because GRP has more fire endurance in terms of heat conduction allowed to the cold side of the boundary. Conversely, GRP is combustible and, because of its insulating abilities, will create a hotter fire than in a compartment with metal boundaries. A fire in a GRP compartment will be much more difficult to extinguish.

c. Obstructions (e.g. machinery, thermal or acoustic insulation) can shield burning GRP from seawater hose streams or other extinguishing media. The MHC unmanned machinery spaces are limited in maneuvering area making it more vital to ensure complete and reliable fire protection system operation.

4202 AIRCRAFT FIREFIGHTING.

a. The ship's aircraft fire fighting personnel shall be organized and trained IAW references (a) and (i).

TAB A - FIREFIGHTING METHODS

Combustible Involved	Fire	Extinguishing Agents
Woodwork, bedding, clothing, combustible stores	A	<ol style="list-style-type: none"> 1. Fixed water sprinkling 2. Firemain 3. AFFF 4. PKP 5. CO2 Extinguisher
Explosives, propellants	A	<ol style="list-style-type: none"> 1. Magazine sprinkling 2. Firemain 3. AFFF 4. Jettison overboard
Paints, spirits, flammable liquid stores	B	<ol style="list-style-type: none"> 1. Fixed F/F System(CO2/HALON) 2. AFFF 3. Installed sprinklers 4. Firemain 5. PKP 6. CO2 Extinguisher
Fuel Oil, JP-5	B	<ol style="list-style-type: none"> 1. Fixed F/F System(CO2/HALON) 2. AFFF 3. PKP 4. Water sprinkling system 5. Firemain 6. Jettison overboard
Deep Fat Fryer System	B	<ol style="list-style-type: none"> 1. Range Guard Fire Extinguishing 2. AFFF 3. PKP and Vari-Nozzle set to Narrow Angle Fog
Electrical/Electronic	C	<ol style="list-style-type: none"> 1. De-energize circuit 2. HALON 1301 3. CO2 4. Firemain (Not solid stream) 5. AFFF, PKP
Magnesium alloys	D	<ol style="list-style-type: none"> 1. Jettison overboard 2. Firemain (Not solid stream) 3. Dry sand

TAB B - REPAIR PARTY LEADER'S (RPL) FIREFIGHTING CHECKLIST

- ___ Fire/Smoke Reported Compartment_____
- ___ Damage Control Central (DCC)/Command Duty Officer (CDO)
Notified
- ___ Rapid Response Team _____ (Comms) _____ Ckt
- ___ Check Firemain Pressure (additional fire pumps req?)
- ___ Damage Control Repair Station Manned/Ready (Comms)
Circuit_____
- ___ Zebra Set Time _____
- ___ Investigators Out (NFTI/Fire Finder issued)
- ___ Order Fire Boundaries (6 Sides)
- ___ Order Smoke Boundaries (Smoke curtains, blankets)
- ___ Order Electrical Isolation (Lighting considerations)
- ___ Order Mechanical Isolation w/exception of fire fighting
systems. (Flammable liquid piping, secure vents,
Compressed Air systems, secure fuel transfers, and heat
sources)
- ___ Space Evacuated/Casualties
- ___ Space Hazards (Check Chapter 4 Section 2 TAB C)
- ___ Class of Fire A_____ B_____ C_____ D_____
- (Fuel Source)
- ___ Installed F/F System Activated Time _____
- ___ FFEs Required?
- ___ Status of ventilation
- ___ Status of flammable/explosive spaces near casualty
- ___ Off Ship Assets Req/Backup Fire Party
Location_____

- ___ Investigators report in at Least Every 15 Min. -
Time_____
- ___ Fire ___ Smoke ___ Boundaries Set
- ___ Status of Mechanical___Electrical ___Isolation
Active Desmoking Required?
- ___ OBA/SCBA Activation Time_____
- ___ Enter Space - Direct or Indirect Method
- ___ Forcible Entry Req'd? - PECU/PHARS
- ___ Status of De-watering Space (Fire Fighting Water (FFW)
Affecting Stability? Space high or Low in the ship?
- ___ Fire Contained
- ___ Status of OBA/SCBA men-Coordinate Relief_____
- (Location)
- ___ Fire Out
- ___ Reflash Watch Set
- ___ Overhaul
- ___ Complete De-watering (w/CHENG's Permission)
- ___ De-smoke (w/CHENG's Permission if Installed Ventilation
is to be used; Ensure Smoke Clears Ship)
- ___ Affected space gas freed
- ___ Major Fire-Vital System Restoration-Coordinate with
EOOW using Master Light-Off Check-Off List

TAB C - COMPARTMENT HAZARD/AREAS

DAMAGE CONTROL REPAIR STATION 3

SPACE	HAZARDS	REMARKS
AFTER STEERING 6-506-0-E	HYDRAULIC OILS	USE AFFF STA 4 WITH INLINE EDUCTOR & 1 1/2" HOSE
ARMORY 2-483-2-Q	AMMUNITION GRENADES	MAG SPRINKLER ACT VLV 2-481-12
#2 FLAM LKR 2-524-0-Q	PAINTS/OILS GREASES	PRI-CO2 FLOODING SEC-#4 AFFF STA
TOWED ARRAY RM 2-506-0-Q	ISOBAR	PRI-HALON FLOODING SEC-#4 AFFF STA
TORPEDO MAGAZINE 1-390-1-M	OTTO II FUEL HE	PRI - MAG SPRINKLER ACT. VLV 1-417-1 SEC - FIREMAIN PRI - SCOTT AIR PACK SEC - OBA
LAUNDRY 2-382-0-Q	BLEACH	CORROSIVE - PERSONNEL HAZARD - DO NOT EXPOSE AL/CU - H2 CREATED

DAMAGE CONTROL REPAIR STATION 2

ANCHOR WINDLASS 1-0-0-E	HYDRAULIC OIL	PRI -#1 AFFF STA SEC - FIRE STA #1-79-1 ELECT ISO_____
CHT PUMP ROOM 5-138-0-E	H2S, METHANE RAW SEWAGE	TOXIC/FLAMMABLE
RADAR ROOM 03-138-1-C	HIGH VOLTAGE	SECURE PWR/CO2

DAMAGE CONTROL REPAIR STATION 5

GALLEY 1-260-0-Q	DEEP FAT FRYER	PRI - RANGE GUARD SEC - PKP/PORT. AFFF ELECT ISO _____
OIL LAB 2-274-2-Q	PETROLEUM CHEMICALS(LIST)	PRI - PORT AFF/PKP SEC - #2 AFFF STA
#1 SK STOREROOM 3-260-0-A	(LIST HAZARDS)	PRI - #2 AFFF STA SEC - FIRE STA #4-299-1
LOG ROOM 2-260-0-Q	CAUSTIC SODA	PERSONNEL HAZARD - H2 CREATED W/ AL/CU

TAB D - MAGAZINE SPRINKLER CONTROL VALVES

<u>REPAIR</u>	<u>ROOT/CONTROL VLV</u>	<u>STATION/LOCATION</u>	<u>COMPT SERVED</u>
2	01-31-1 (LOCK OPEN)	GROUP 1	01-23-1-M
2	01-33-1	FR 33 - 01 DECK STBD SIDE	01-23-1-M

NOTE: Unless otherwise specified, magazine sprinkler systems are to be activated only by order of the CO. The ship's policy may be attached to this list.

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SECTION 3 - MACHINERY SPACE FIREFIGHTING DOCTRINE

4300 MAIN MACHINERY SPACE FIREFIGHTING DOCTRINE

a. This section of the Repair Party Manual is the Force Policy for Combating Main Machinery Space Fires; no additional letters of promulgation are required. CO shall ensure completion of the following actions:

b. Complete Section 3 TABS A through T. Reference (d) applies when completing the Isolation List TABS G and H. Ensure isolation lists are completed for the required systems in the prescribed order. Ensure power sources for HALON system alarms and indicators and AFFF bilge sprinklers are clearly identified in the Isolation List. When completing TAB J, De-Watering From Outside Space, list valves in the order in which they are to be aligned.

c. Some line items may not be applicable to all ship classes. In these cases, line out any item that does not apply.

d. Insert copies of the Main Machinery Space Fire Doctrine with completed Tab pages into each shipboard copy of the Repair Party Manual. The ship's DCA shall maintain the Repair Party Manual master copy.

e. Prepare laminated copies of Section 3 Tabs A through T. They contain required actions by repair/fire party personnel and should be kept in the DCRSs.

e. Fill in the appropriate blanks in the Main Machinery Space F/F Doctrine. If AFFF needs to be conserved, sprinklers may be operated for as little as one minute.

TAB A - ACTIONS FOR A MAJOR FLAMMABLE LIQUID LEAK UNDERWAY

a. Watchstander/Space Supervisor Actions:

Initial actions:

_____ Direct actions according to applicable EOCC.

b. EOOW/CCS WATCH Actions:

_____ Direct actions according to applicable EOCC.

c. OOD Actions:

_____ Set Condition II DC (With all Repair Lockers manned)

_____ Establish communications with DC Central or location from which command and control for damage control is exercised.

_____ Prepare for loss or reduction of ship's maneuverability.

_____ Notify other ships or authorities as appropriate.

_____ Look for smoke or other signs of fire to determine maneuverability requirements.

TAB B - ACTIONS FOR A MAJOR FLAMMABLE LIQUID LEAK INPORT.

a. Watchstander/Space Supervisor Actions:

Initial actions:

_____ Direct actions according to applicable EOCC.

b. EOOW/CCS WATCH Actions:

_____ Direct actions according to applicable EOCC.

c. OOD Actions:

_____ Set Condition II DC.

_____ Establish communications with DC Central or location from which command and control for damage control is exercised.

_____ Ensure all off-watch personnel are assembled at designated location.

_____ Notify other ships or authorities as appropriate.

_____ Be observant for smoke or other signs of fire.

d. CDO Actions:

_____ Position self to best exercise command and control IAW ship's specific policy.

_____ Ensure appropriate authorities are notified.

_____ Request assistance as required (other ships, base fire department).

TAB C - UNDERWAY ACTIONS IN CASE OF CLASS BRAVO FIRE

a. Watchstander/Space Supervisor Actions:

Initial actions:

- ___ Direct actions according to applicable EOCC.
- ___ Deploy portable PKP extinguishers and operate as needed.
- ___ Activate AFFF bilge sprinkling, if installed, (one minute minimum)

NOTE: If AFFF bilge sprinkling and hoses have a common supply from a 50-gallon tank through a FP-180 proportioner, simultaneous use of hose and bilge sprinkling shall be avoided to prevent losing required discharge pressure.

- ___ Leave space ventilation in operation; set negative ventilation. Exhaust on high / supply on low.

NOTE: If ventilation supply and exhaust fans are interlocked and the controls are in EOS/CCS or at the access of the space, set emergency exhaust. Set exhaust on high and supply off.

- ___ If evacuation is ordered or necessary, don OCENCO EEBD (for ships with SCOTT EEBD in the engineering spaces, don SEEDS and shoulder a SCOTT EEBD to egress).
- ___ Upon evacuation activate Halon and AFFF Bilge Sprinkling (if installed) if not already activated.
- ___ Once space is evacuated, report to affected DCRS or Scene Leader the following:
 - Status of personnel evacuated from or remaining in the space.
 - Status of the leak and the location and intensity of fire.
 - Times Halon and/or AFFF Bilge Sprinkling (if installed) were activated (if activated in space) and secured.
 - Status of lighting, ventilation, firefighting equipment and any operating machinery.
 - Recommend reentry route.
 - Evacuees should muster in areas designated in the applicable section of this chapter.

b. EOOW Actions:

Initial actions:

- ___ Report Class "B" fire to the OOD.
- ___ Request OOD set Condition II DC.
- ___ Direct actions according to applicable EOCC.

Concurrent actions:

- ___ Ensure AFFF bilge sprinkling is activated, if installed, for 1 minute (at a minimum)
- ___ Ensure watchstanders in adjacent spaces shoulder an EEBD).
- ___ Order space evacuated if the fire is reported out of control or if other circumstances arise that make evacuation necessary.
- ___ If evacuation is ordered or if reasonably sure the watch team is trapped or killed, ensure Halon and AFFF bilge sprinkling are activated.
- ___ Ensure negative ventilation is set in the affected space
- ___ Order positive ventilation set in unaffected spaces
- ___ The DCA will assume control of fire fighting efforts if/when the space is evacuated. To assist the DCA in assuming control of firefighting efforts, report status of:
 - Affected machinery space
 - Mechanical/electrical isolation
 - Fire fighting efforts

NOTE: Although the DCA assumes control of fire fighting efforts, the EOOW retains engineering plant control.

Restoration:

Direct affected machinery space restoration according to applicable EOCC/EOP.

c. DCA Actions:

Initial actions:

- ___ Request status report from the EOOW.
- ___ Verify Primary Halon activation and release.
(Activation Time _____)
(Release Time_____)

NOTE: If primary Halon does not extinguish the fire (Halon bad), determine and correct the cause of Halon failure, then order reserve Halon activated, if installed. Order use of the time delay bypass.

- ___ Ensure AFFF stations are manned.
- ___ Verify AFFF bilge sprinkling activation.
(Activation Time_____)
(Secured Time_____)
- ___ Report to the OOD the status of evacuees.
- ___ Order re-entry route (coordinate with OSL/DCRS Leader).

Concurrent actions:

- ___ Ensure investigators are deployed.
- ___ Ensure fire and smoke boundaries are set.
- ___ Ensure that adequate firemain pressure is maintained.
- ___ Order mechanical isolation of the affected space.
- ___ Order electrical isolation of the affected space.

NOTE: Electrical power may be required to mechanically isolate various equipment (e.g. motor operated valves).

- ___ Order non-affected DCRS(s) to provide assistance as required.
- ___ Determine effectiveness of primary/reserve Halon
(The following are indication of Halon effectiveness (HALON GOOD))

- White smoke topside
- No blistering paint in surrounding spaces
- Visual inspection Ellison doors (no indication of black smoke or flame)

___ If Halon is good, allow minimum 15 minutes soak time prior to reentry.

In determining when to reenter the space, consider following (at a minimum):

- Space temperature
- Dissipation of Halon
- Possible impact on ship's stability
- Conditions, which may affect AFFF barrier
- Necessity to restore the affected space

NOTE: Continue to monitor Halon good or bad until the affected space is reentered. Keep crew apprised of situation over 1MC.

___ If Halon is not installed or appears to have been bad, re-entry should be attempted as quickly as possible.

___ Monitor firemain pressure.

___ Order back-up Fire Party to report to the affected Repair Party Leader.

___ Order setup of OBA/SCBA change out area and recovery station IAW TAB K.

Reentry actions:

___ Ensure mechanical isolation is complete and electrical isolation is completed or in progress.

___ Order AFFF sprinkling activated for 2 minutes before reentry.

(Activation Time_____)

(Secured Time_____)

___ Order space reentry.

___ Record OBA/SCBA actuation times.

___ Report time of reentry to OOD.

- ___ Report when the fire is contained to OOD.
- ___ Report when the fire is out/reflash watch is set to the OOD.
- ___ Determine de-smoking procedures. Inform OOD of smoke exit points.
- ___ Order affected Repair Party Leader to commence de-smoking.
- ___ Report when the fire is overhauled to the OOD.
- ___ Order DCRS to de-water. (CO's permission required).
- ___ Report when the space is de-watered to the OOD.
- ___ Report when the space is de-smoked to the OOD.
- ___ Report when atmospheric tests are complete and space is safe for personnel to enter without OBA's/SCBA's.
- ___ Order affected Repair Party Leader to investigate for damage.

d. Affected DC Repair Station Officer/Leader Actions:

Initial actions:

- ___ Man and establish communications with Main Control/CCS/DCC and the On-Scene Leader.
- ___ Report when manned and ready.
- ___ Order setting of fire and smoke boundaries.

Concurrent actions:

- ___ Ensure investigators are deployed.
- ___ When ordered, mechanically isolate the space.

NOTE: Ensure space has been evacuated prior to isolating fire fighting equipment in the space. Activation of Halon should not be delayed because of fire fighting efforts.

- ___ When ordered, electrically isolate the space (The Decision to secure space lighting or not rests with the OSL).
- ___ Report fire and smoke boundaries set.

NOTE: Primary fire boundaries shall have hoses laid out and made ready as appropriate.

- ___ Muster evacuees and receive the following reports:
 - Status of personnel evacuated from or remaining in the space.
 - Status of the leak and the location and intensity of fire.
 - Times Halon and/or AFFF Bilge Sprinkling (if installed) were activated (if activated in space) and secured.
 - Status of lighting, ventilation, firefighting equipment and any operating machinery.
 - Recommended reentry route.
- ___ Report information to DCA and send evacuees to designated area IAW TAB K.

____ Upon verification of evacuation of personnel from the affected space, order On-scene Leader (OSL) to mechanically isolate fire-fighting equipment (AFFF to the space hose reel).

____ Verify Halon activation and release. (Time:) Report to DCA.

____ Ensure AFFF bilge sprinkling is secured after one minute.

____ Ensure the NFTI is warmed up and tested.

____ Report effectiveness of primary/secondary Halon:
(The following are indicators of Halon effectiveness)

- White smoke topside.
- No blistering paint in surrounding spaces.
- Visual inspection Ellison doors (no indication of black smoke or flame).

NOTE: If Halon did not extinguish the fire, attempt to determine why, or if the fire has reflash, order On Scene Leader to activate secondary Halon (if installed). If ventilation has been secured, by-pass the time delay when activating secondary Halon. Report indications of effectiveness of secondary Halon, if activated, and report to DCA.

____ Pass to on-scene leader status of:

- Personnel evacuated from or remaining in the space.
- Status of the leak and the location and intensity of fire.
- Times Halon and/or AFFF Bilge Sprinkling (if installed) were activated (if activated in space) and secured.
- Halon effectiveness from investigators.
- Status of lighting, ventilation, firefighting equipment location of obstructions and any operating machinery.
- Recommended reentry route.

Reentry actions:

____ Report when manned and ready to enter affected space.

____ When ordered, activate AFFF bilge sprinkling for 2 minutes. Report start/stop times.

____ When ordered, direct space reentry.

- ___ Record/monitor OBA/SCBA activation times.
- ___ Report when the space is entered (re-entered).
- ___ Send OBA/SCBA reliefs to the scene as necessary. Relieve all fire team members with OBA's/SCBA's no more than 30 minutes after OBA/SCBA activation.

NOTE: Fire team members may need relief before the 30 minutes due to heat stress or the size of SCBA bottles. ___ Record OBA/SCBA start times for reliefs.

- ___ Report when the fire is contained.
- ___ Report when the fire is out and reflash watch is set.
- ___ Report status of hang fires/hot spots.
- ___ When ordered, commence de-smoking.
- ___ Report when the fire is overhauled.
- ___ Request permission to commence de-watering.

CAUTION: Do not disturb AFFF foam blanket before overhaul is complete.

- ___ Report when de-watering begins. (CO's permission is required)
- ___ Report when de-watering is complete.
- ___ Report when the space is de-smoked.
- ___ Report results of atmospheric test(s).

e. Affected On-Scene Leader Actions:

Initial actions:

_____ Report to scene. Establish communications with Damage Control Repair Station.

Concurrent actions:

_____ Assist evacuating personnel, if necessary. (If possible determine status of leak, location of fire, status of evacuees and firefighting equipment).

_____ Verify Halon activation and release.

_____ Verify AFFF activation.

_____ Upon verification of evacuation, isolate AFFF to space hose reel.

NOTE: If Halon fails to discharge, make sure the primary or secondary Halon system is activated using the time delay bypass. Use of the time delay bypass is authorized when the space has been evacuated and ventilation to the space has been secured long enough to prevent the possibility of wind-milling ventilation fans drawing Halon out of the space.

_____ Report indications of Halon effectiveness at reentry access.

_____ Verify leak/space isolation and personnel evacuation.

Reentry actions:

_____ Ensure buffer zone/dead air zone has been established.

_____ Ensure activation of AFFF bilge sprinkling for 2 minutes before reentry (and report to DCRS).

_____ Order and report OBA/SCBA activation times.

_____ Direct space reentry when ordered.

NOTE: Request OBA/SCBA relief's as required.

- _____ Report when the space is reentered.
- _____ Report when the fire is contained.
- _____ Report when the fire is out.
- _____ Report when reflash watch is set.
- _____ Report status of hang fires/hot spots.
- _____ Report when de-smoking begins.
- _____ Report when the fire is overhauled.
- _____ Report when de-watering begins.
- _____ Report when de-watering is complete.
- _____ Report when de-smoking is complete.
- _____ Request atmospheric testing.
- _____ Report results of atmospheric test(s).

f. Affected Team Leader Actions:

Reentry actions:

- _____ When ordered, reenter space and direct fire fighting efforts.
- _____ Report when fire is contained.
- _____ Report when fire is out.
- _____ Report reflash watch set.
- _____ Direct overhaul of the fire, report status of hang fires/hot spots.
- _____ Report when de-smoking begins.
- _____ Report when fire is overhauled.
- _____ Report when de-watering begins.
- _____ Report when space is de-watered.
- _____ Report when space is de-smoked.
- _____ Request Gas Free Engineer in the space.

g. Leaders of Unaffected DC Repair Stations Actions:

- _____ Set assigned fire/smoke boundaries according to TABS E and F.
- _____ When ordered by DCA, provide OBA/SCBA reliefs, OBA canisters, AFFF, and other equipment, as necessary.
- _____ Investigate surrounding area, especially those potentially affected by vent ducting or intakes/uptakes associated with the affected space.
- _____ Setup OBA/SCBA change out area, and firefighter recovery station according to TAB K.

h. OOD Actions:

- _____ Set Condition II DC.
- _____ Establish communications with DC Central/CCS and EOOW.
- _____ If possible, maneuver the ship to avoid smoke ingestion by ventilation systems.
- _____ Be prepared for loss or reduction in ships maneuverability.
- _____ Notify other ships and Officer in Tactical Command as appropriate.
- _____ Be observant for changes in smoke color and quantity and report any changes to DCC/CCS.

TAB D - INPORT ACTIONS IN CASE OF CLASS BRAVO FIRE

a. Watchstander/Space Supervisor Actions:

___ Direct actions according to applicable EOCC.

___ Deploy portable PKP extinguishers to the scene of the fire and operate as needed.

___ Activate AFFF bilge sprinkling, if installed (one minute minimum).

NOTE: If AFFF bilge sprinkling and hoses have a common supply from a 50-gallon tank through a FP-180 proportioner, simultaneous use of hose and bilge sprinkling shall be avoided to prevent losing required discharge pressure.

___ Leave space ventilation in operation; set negative ventilation, if possible. Exhaust on high / supply on low.

NOTE: If ventilation supply and exhaust fans are interlocked and the controls are in EOS/CCS or at the access of the space, set emergency exhaust. Set exhaust on high and supply off.

___ Once evacuation is ordered or necessary, don OCENCO EEBD (for ships with SCOTT EEBD in the engineering spaces, don SEEDS and shoulder a SCOTT EEBD to egress).

___ Once space is evacuated, report to affected DCRS or DCC.

- Status of personnel evacuated from or remaining in the space.
- Status of the leak and the location and intensity of fire.
- Times Halon and/or AFFF Bilge Sprinkling (if installed) were activated (if activated in space) and secured.
- Status of lighting, ventilation, firefighting equipment, location of obstructions and operating machinery.
- Recommend reentry route.
- Evacuees should muster in areas designated in the applicable section of this chapter.

CONSIDERATION: If the EOOW is not directly controlling the Propulsion plant (i.e. in the plant and monitoring it), then whoever is controlling the plant, fulfilling the EOOW's functions (e.g. space supervisor, topwatch, EDO) must perform

the EOOW's duties in this doctrine. If the topwatch is exercising control of the entire plant (EOOW not on station) they must perform both the topwatch (space supervisor) and the EOOW MSFD checklists (until relieved by the EOOW or EDO). If this is the case, then procedures for this section may be different than for the U/W case. Incorporate the different sections to facilitate their use.

b. EOOW/EDO Actions:

- _____ Order the affected plant secured IAW EOCC. Report the class, location, and source of the fire to the OOD and request that the IET be called away.
 - _____ Announce casualty to all engineering spaces.
 - _____ Ensure alternative power is available.
 - _____ Inform CDO and make recommendation for additional assistance (base fire department or assistance from other ships).
 - _____ Direct actions according to applicable EOCC.
 - _____ Ensure AFFF bilge sprinkling is activated, if installed, for a minimum of 1 minute.
 - _____ Ensure watchstanders in adjacent spaces obtain and shoulder an EEBD (if not already worn).
 - _____ Order space evacuated when the fire is reported out of control or if other circumstances arise which make evacuation necessary.
 - _____ Activate Halon and AFFF bilge sprinkling. (Activation of Halon should not be delayed because of fire fighting efforts).
 - _____ Ensure negative ventilation is set in the affected space.
 - _____ Ensure positive ventilation is set in the unaffected space.
 - _____ Order mechanical/electrical isolation.
 - _____ Order complete electrical isolation of the affected space once the space has been evacuated.
- NOTE: Electrical power may be required to mechanically isolate various equipment (e.g. motor operated valves).
- _____ Ensure affected AFFF station is manned and establish communication with station operator.
 - _____ If reasonably sure the watch team is trapped or killed ensure Halon and AFFF Bilge Sprinkling are activated.

_____ When the Fire Marshall assumes control of firefighting efforts:

- Report status of affected machinery space.
- Report Mechanical/electrical isolation.
- Report fire-fighting efforts.
- The DCC will assume control of fire fighting efforts if/when the space is evacuated and communications are established.

NOTE: Although DCC assumes control of fire fighting efforts, the EOOW retains engineering plant control.

Restoration:

Direct affected machinery space restoration according to applicable EOCC.

NOTE: Reports to the DCC required by the underway checklist should be made to the officer assigned to direct fire-fighting efforts from DCC, if one is assigned.

_____ If DCC/CCS is not manned or is not responsible for controlling and directing fire-fighting efforts in main machinery spaces inport per the ship's SORM, complete the applicable steps of the checklist for DCA Actions (pages 76 - 78). Perform these steps only after completing the checklist for EOOW (Underway) to the point where the DCC assumes control of fire fighting.

c. DCC Actions: (as assigned by Ship's SORM)

- _____ Establish communications with EOOW/EDO/Affected DCRS.
- _____ Make recommendations to the CDO regarding assistance from the Base Fire Department or other ships.
- _____ Request OOD call Base Fire Department and ships on the same pier.

Note: Use personnel in the duty section as necessary.

- _____ Request report from the EOOW. Take control of fire fighting efforts if/when the space is evacuated or if communication with the affected space is lost.

- _____ Verify Halon activation. (Time: _____)

NOTE: If primary Halon does not extinguish the fire, determine and correct the cause of Halon failure, then order reserve Halon activated, if installed. Order use of the time delay by pass.

- _____ Obtain the time of bilge sprinkling system activation, if installed from the affected DCRS Leader or EOOW.
- _____ Receive status of space evacuees.
- _____ Order re-entry route (coordinate with OSL/DCRS Leader).

Concurrent actions:

- _____ Ensure investigators are deployed.
- _____ Ensure AFFF stations are manned.
- _____ Ensure fire and smoke boundaries are set and Fire Zone Doors are released, if installed.
- _____ Ensure that adequate firemain pressure is maintained. Start additional fire pumps as needed.

NOTE: If adequate firemain cannot be maintained with the available installed fire pumps, order portable pumps rigged or hoses rigged from the pier as required.

- _____ Order mechanical isolation of the affected space.

_____ Order complete electrical isolation of the affected space once the space has been evacuated.

NOTE: Electrical power may be required to mechanically isolate various equipment (e.g. motor operated valves).

NOTE: Some ship classes may not be able to perform complete electrical isolation of all equipment without isolating lighting. In cases where this exists, if lighting is to remain on, the On-Scene leader must be advised of which equipment or power distribution circuits are energized.

_____ Order unaffected DCRSs provide OBA/SCBA reliefs, relief or back-up hose teams, or equipment as required.

_____ Determine if primary/secondary Halon is good or bad:
(The following indicate that Halon is good)

- White smoke topside.
- No blistering paint in surrounding spaces.
- Visual inspection Ellison doors (no indication of black smoke or flame).

_____ If Halon is good, allow minimum 15 minutes soak time prior to reentry.

When determining if conditions permit reentry, at a minimum, consider following:

- Space temperature
- Halon dissipation
- Possible flooding of the space and ship's stability
- Conditions that may dynamically affect the vapor lock
- Necessity to restore the affected space

NOTE: Continue to monitor Halon good or bad until the affected space is reentered.

_____ If Halon is not installed or appears to have been bad, reentry should be attempted as quickly as possible.

NOTE: Where installed, activate AFFF sprinkling for 2 minutes before reentry.

_____ Monitor firemain pressure.

___ Order back-up Fire Party to report to the affected Repair Party Leader.

___ Order setup of OBA/SCBA change out area and recovery station according to TAB K.

Reentry actions:

___ Ensure mechanical isolation is complete and electrical isolation is completed or in progress.

NOTE: The on-scene leader shall decide whether to secure lighting prior to reentry, if not already isolated.

___ Order AFFF sprinkling activated for a minimum of 2 minute before reentry.

___ Order space reentry.

___ Record OBA/SCBA actuation times.

___ Report time of reentry to OOD.

___ Report when the fire is contained to OOD.

___ Report when the fire is out to the OOD.

___ Report when reflash watch is set to the OOD.

___ Report status of hang fires to OOD.

___ Determine de-smoking procedures. Inform OOD of smoke exit points. (If installed ventilation is to be used, the Engineer Officer's permission is required.)

___ Order affected Repair Party Leader to commence de-smoking.

___ Report when the fire is overhauled to the OOD.

___ Order DCRS to de-water. (May be commenced earlier if Fire-fighting water adversely affects ship stability or fire fighting efforts.)

___ Report when de-watering is complete to the OOD.

___ Report when the space is de-smoked to the OOD.

_____ Report when atmospheric tests are complete and space is safe for personnel to enter without OBA's/SCBA's.

_____ Order affected Repair Party Leader to investigate for damage to vital and non-vital systems or equipment.

NOTE: The checklist for DCA underway will be completed by the EOOW/EDO if DCC is not manned or does not direct fire-fighting efforts inport according to the ship's SORM.

d. Affected Repair Party Leader Actions:

Inport, the affected repair party leader reports to:
_____ (SHIP SPECIFIC).

Initial actions:

_____ Man affected DCRS and establish communications with Main Control/CCS/DCC and the On-Scene Leader.

_____ Report when manned and ready.

Concurrent actions:

_____ When ordered, mechanically isolate the space.

NOTE: Ensure space has been evacuated prior to isolating in space fire fighting equipment.

_____ When ordered, electrically isolate the space.

NOTE: The decision to isolate lighting or not rests with the On-Scene Leader. Some ship classes may not be able to perform complete electrical isolation of all equipment without isolating lighting. In cases where this exists, if lighting is to remain on, the On-Scene leader must be advised on which equipment or power distribution circuits are energized.

_____ Order fire and smoke boundaries set and a buffer zone established.

NOTE: Primary fire boundaries shall have hoses laid out and charged as appropriate. Reentry should not be delayed for purposes of placing hoses at fire boundaries.

_____ Muster evacuees and receive the following reports:

- Status of personnel evacuated from or remaining in the space.
- Status of the leak and the location and intensity of fire.
- Times Halon and/or AFFF Bilge Sprinkling (if installed) were activated (if activated in space) and secured.
- Status of lighting, ventilation, firefighting equipment, location of obstructions and operating machinery.
- Recommended reentry route.

_____ Report information to DCA or send evacuees to report to the DCA.

_____ Upon verification of evacuation of personnel from the affected space, mechanically isolate fire-fighting equipment (AFFF to the space hose reel).

_____ Record and report Halon activation and release. (Time:)

_____ Order AFFF bilge sprinkling secured at a minimum of 1 minute (no more than 4 min).

_____ Ensure the NFTI is warmed up and tested.

_____ Determine effectiveness of primary/reserve Halon:
(the following are indicators of Halon good)

- White smoke topside
- No blistering paint in surrounding spaces
- Visual inspection Ellison doors (no indication of black smoke or flame)

NOTE: Continue to monitor Halon effectiveness until the space is re-entered.

_____ If Halon did not extinguish the fire, attempt to determine why, or if the fire has reflash, order On Scene Leader to activate secondary Halon (if installed). If ventilation has been secured, by-pass the time delay when activating secondary Halon.

_____ Report indications of secondary Halon good or bad, if activated, and report to Fire Marshall.

_____ Pass to on-scene leader status of:

- Personnel evacuated from or remaining in the space.
- Status of the leak and the location and intensity of fire.
- Times Halon and/or AFFF Bilge Sprinkling (if installed) were activated (if activated in space) and secured.
- Halon status from investigators.
- Status of lighting, ventilation, firefighting equipment, location of obstruction and operating machinery.
- Recommended reentry route.

Reentry actions:

- ___ Report when manned and ready to enter affected space.
- ___ When ordered, activate AFFF bilge sprinkling for 2 minutes. Report start/stop times.
- ___ When ordered, direct space reentry.
- ___ Record/monitor OBA/SCBA activation times.
- ___ Report when the space is entered (re-entered).
- ___ Send OBA/SCBA reliefs to the scene as necessary. Relieve all fire team members with OBA/SCBAs no more than 30 minutes after OBA activation.

NOTE: Fire team members may need relief before the 30 minutes due to heat stress.

- ___ Record OBA/SCBA start times for reliefs.
- ___ Report when the fire is contained.
- ___ Report when the fire is out.
- ___ Report when reflash watch is set.
- ___ Report when the fire is overhauled.
- ___ When ordered, commence de-smoking.

NOTE: Use of installed ventilation for de-smoking requires Engineer officer's permission Per reference (a).

- ___ Report when the fire is overhauled.
- ___ Request permission to commence de-watering, if needed to improve stability or DC teams' restoration efforts.

CAUTION: Do not disturb AFFF foam blanket before overhaul is complete. Do not disturb the AFFF foam blanket anymore than necessary.

- ___ Report when de-watering begins.

- ___ Report when de-watering is complete.
- ___ Report when the space is de-smoked.
- ___ Report results of atmospheric test(s).

e. Affected On-Scene Leader Actions:

Initial actions:

_____ Report to scene. Establish communications with Damage Control Repair Station.

Concurrent actions:

_____ When ordered, direct personnel to mechanically/electrically isolate the space with the exception of lighting, ventilation and firefighting equipment. Move to DCRL responsibility except lighting.

_____ Assist evacuating personnel, if necessary. (If possible determine status of leak, location of fire, status of evacuees and firefighting equipment).

_____ Verify Halon activation and release. (Time:)

_____ Verify AFFF activation. (Time:)

_____ Upon verification of evacuation, isolate AFFF to space hose reel.

NOTE: If Halon fails to discharge, make sure the primary or secondary Halon system is activated using the time delay bypass. Use of the time delay bypass is authorized when the space has been evacuated and ventilation to the space has been secured long enough to prevent the possibility of wind-milling ventilation fans drawing Halon out of the space.

_____ Electrically isolate ventilation.

_____ Report indications of Halon effectiveness at reentry access.

_____ Receive report from affected DCRS relaying information reported by evacuees and information reported by sources (other than the scene) on leak/space isolation and personnel evacuation.

_____ Determine re-entry route and inform the DCRS.

_____ Decide if one or two hose teams will be used in reentry.

NOTE: OSL should consider the need to use indirect cooling prior to direct firefighting.

_____ Determine if lighting will remain on. If other circuits are to remain energized inform the team leader and hose teams.

Reentry actions:

_____ Ensure buffer zone/dead air zone has been established.

_____ Direct (and report to DCRS) activation of AFFF bilge sprinkling for 2 minutes before reentry.

_____ Order and report OBA/SCBA activation times.

_____ Direct space reentry when ordered.

NOTE: Request OBA/SCBA relief's as required.

_____ Report when the space is reentered.

_____ Report when the fire is contained.

_____ Report when the fire is out.

_____ Report when reflash watch is set.

_____ Report status of hang fires/hot spots.

_____ When ordered report when de-smoking begins.

_____ Report when the fire is overhauled.

_____ Report when de-watering begins.

_____ Report when de-watering is complete.

_____ Report when de-smoking is complete.

_____ Request atmospheric testing.

_____ Report results of atmospheric test(s).

f. Affected Team Leader Actions:

Reentry actions:

_____ When ordered, reenter space and direct fire fighting efforts.

NOTE: If Halon (primary and secondary) is bad. Reenter the space as soon as possible.

_____ Report when fire is contained.

_____ Report when fire is out.

_____ Set reflash watch and report.

_____ Direct overhaul of the fire, report status of hang fires/hot spots.

_____ Report when de-smoking begins.

_____ Report when fire is overhauled.

_____ Report when de-watering begins.

_____ If needed to assist the damage control teams' efforts, request permission to begin de-watering. Maintain a blanket of AFFF in the bilge until fire hazard is removed.

_____ Report when space is de-watered.

_____ Report when space is de-smoked.

_____ Request Gas Free Engineer in the space.

g. Leaders of Unaffected DC Repair Stations Actions:

- _____ Set assigned fire/smoke boundaries according to TABS E and F.
- _____ When ordered by DCA, provide OBA/SCBA reliefs, OBA canisters, SCBA bottles, AFFF and other equipment, as necessary.
- _____ Investigate surrounding area, especially those potentially affected by vent ducting or intakes/uptakes associated with the affected space.
- _____ Set up OBA/SCBA change out area, and firefighter recovery station according to TAB K.

h. OOD Actions:

- _____ Secure the Quarterdeck to nonessential traffic.
- _____ Notify base fire department and adjacent ships per ship's policy.
- _____ Establish communications with the EDO/EOW and affected DC Repair Station.
- _____ Look for changes in smoke color and quantity and report any changes to DC Central.
- _____ Make sure the Duty Section Leader musters all hands on board not on the IET, SAT, or BAF. Standby to assist with OBA/SCBA reliefs, smoke/fire boundaries, etc. as required.
- _____ Await further instructions from CDO.

i. CDO Actions:

- _____ Position self to best exercise command and control IAW ship's specific policy.
- _____ Ensure appropriate authorities are notified.
- _____ Request assistance when required (other ships, base fire department).

TAB E - FIRE BOUNDARIES

COMPARTMENT: (SPACE NAME/NUMBER)

PRIMARY BOUNDARIES or GROUPS:

BOUNDARY or GROUP #
COMPARTMENT NAME/NUMBER
BULKHEAD/DECK
FIRE STATION/# Hose Lengths
RESPONSIBLE PARTY (INPT/UW)
OBA /SCBA REQUIRED? (Y/N)

SECONDARY BOUNDARIES or GROUPS:

BOUNDARY or GROUP #
COMPARTMENT NAME/NUMBER
BULKHEAD/DECK
FIRE STATION/# Hose Lengths
RESPONSIBLE PARTY (INPT/UW)
OBA /SCBA REQUIRED? (Y/N)

TAB F - SMOKE BOUNDARIES

COMPARTMENT NAME: _____

COMPARTMENT NUMBER: _____

PRIMARY:
(INCLUDING BUFFER ZONE)

FITTING NUMBER
CLASSIFICATION
CURTAIN/BLANKET
RESPONSIBLE PARTY
INPT/UW
OBA /SCBA REQUIRED? (Y/N)

SECONDARY:
(OUTSIDE BUFFER ZONE)

FITTING NUMBER
CLASSIFICATION
CURTAIN/BLANKET
RESPONSIBLE PARTY
INPT/UW
OBA /SCBA REQUIRED? (Y/N)

ISOLATION LIST

COMPARTMENT NAME: _____

COMPARTMENT NUMBER: _____

PRIMARY BOUNDARY FWD: _____

OVERHEAD BOUNDARY _____

PRIMARY BOUNDARY AFT: _____

SECONDARY BOUNDARY FWD: _____

OVERHEAD BOUNDARY _____

SECONDARY BOUNDARY AFT: _____

TAB G - ELECTRICAL ISOLATION

ELECTRICAL SYSTEMS

SYSTEM TYPE

NOUN NAME

CKT NUMBER

LOCATION

RESPONSIBLE PARTY (INPT/UW)

FUSE/CKT BKR

PRIMARY/ ALTERNATE

NOTE: Electrical isolation shall include all machinery, switchboards and load centers required to isolate the affected space. Ensure power to any installed fire fighting system that could be utilized remains energized. (Scene leader may direct that lighting remain ON.)

TAB H - MECHANICAL ISOLATION

MECHANICAL SYSTEMS

TYPE

NOUN NAME

VALVE NUMBER

REMOTE OPERATOR

RESPONSIBLE PARTY (INPT/UW)

PRIORITY

TAB I - VENTILATION SYSTEMS

Nat./FAN
CNTRLR
LOCATION
REMOTE CNTRL LOC.
CLSR TYPE
DESIGNATION
/AREA SERVED
WTRDECK
INTAKE
WTRDECK
EXHAUST
RESPONSIBLE PARTY (INPT/UW)

TAB J - DE-WATERING FROM OUTSIDE SPACE

SPACE TO DEWATER
EDUCTOR NUMBER USED
OPEN THE FOLLOWING VALVES(LOC. OF OPERATORS)
PRIMARY/ALTERNATE

TAB K - OBA CANISTER DISPOSAL/SCBA CHANGE OUT AREA

FOR FIRE IN

LOCATION

DCRS RESPONSIBILITY

ALTERNATE LOCATION

DCRS RESPONSIBILITY

AUX 1

MER 1

GEN ROOM

EEBD COLLECTION AREA

TAB L - PRIMARY/SECONDARY SPACE REENTRY PLAN

NOTE: For each machinery space include lineup of #1/#2 hoses for both primary and secondary accesses. Including: fireplug location, number of required hoses, and use of in-line eductor or AFFF hose reel, as applicable. Specify designation of primary and secondary access for each space.

SPACE: _____

PRIMARY ACCESS (FILL IN LOCATION)

HOSE NUMBER

FIREPLUG NUMBER

LENGTHS OF HOSE

IN-LINE EDUCTOR? YES/NO

AFFF HOSE REELS? YES/NO

#1 HOSE

#2 HOSE

SECONDARY ACCESS (FILL IN LOCATION)

HOSE NUMBER

FIREPLUG NUMBER

LENGTHS OF HOSE

IN-LINE EDUCTOR? YES/NO

AFFF HOSE REELS? YES/NO

#1 HOSE

#2 HOSE

TAB M - DE-SMOKING

SPACE
LOCATION
PRIMARY
LOCATION
ALTERNATE
DCRS RESPONSIBLE
PRIMARY
DCRS RESPONSIBLE
ALTERNATE
DE-SMOKING PLAN

NOTE: Ships shall prepare de-smoking plans for each of the following contingencies.

- a. Use of positive ventilation/over pressurization.
- b. Use of installed ventilation. Ref (a),(b),(e) and Naval Firefighters Thermal Imager Technical Manual. (Requires Engineer Officer's permission).
- c. Use of portable de-smoking equipment.
- d. Use of active de-smoking ref (b).

COMPARTMENT	PROCEDURE
(SPACE)	a. b. c. d.
(SPACE)	a. b. c. d.

TAB N - ATMOSPHERIC TESTING

NOTE: Ship must list the atmospheric tests that may be required during post-fire gas free testing for each machinery space. Different spaces may require different gas free tests based on the potential hazards in that particular space. (e.g., if Halon 1301 has been discharged, a test of Hydrogen Fluoride shall be done.) References (a) and (c) apply.

SPACE

REQUIRED TEST(S)

TAB O - OBA/SCBA RELIEVING PROCEDURES

NOTE: In a main space fire, personnel stay times may be as short as 3-10 minutes. When to provide OBA/SCBA reliefs will largely be based on heat intensity and personnel fatigue, fitness level, and respiration rates.

OBA/SCBA relieving procedures will occur as follows:

DCRS 5 POSITION	1ST RELIEF	2ND RELIEF
-----------------	------------	------------

#1 NOZZLEMAN		
#2 NOZZLEMAN		
TEAM LEADER		
SCENE LEADER		
DCRS OFFICER		

NOTE: Reliefs for at least those positions listed above should be appointed in writing, by position. Reliefs for other hoseman may be appointed in writing. Reliefs may relieve through normal bump-up procedures. Reliefs may come from any other DCRS or DCRS 5 itself. If they're from another DCRS, these individuals should participate in regular DCRS 5/main space fire training. The critical billets listed above will have at least two qualified reliefs. The scene leader and DCRS officer may have only one assigned temporary relief since these individuals will not normally be directly exposed to radiant heat but are still within the buffer zone.

TAB P - FIXED CO2 FLOODING SYSTEM ACTUATION STATIONS

REPAIR	STATION	LOCATION/FRAME	COMPARTMENT SERVED
2		2-64-0-L FR 64 (S) 4-64-0-Q FR 64 (S)	INNER GMLS
2		2-64-0-L FR 64 (S) 4-64-0-Q FR 64 (S)	OUTER GMLS
3		2-464-01-L FR 468 (P) 3-464-0-Q FR 473 (P)	FLAM LIQUID STRM 6-464-4-K

TAB Q - HALON FLOODING SYSTEM ACTUATION STATIONS

REPAIR STATION	LOCATION/FRAME	COMPARTMENT SERVED	POWER SOURCE
2	2-40-2-L FR 45 (S) 3-43-0-L FR 45 (S)	FLAM LIQUID STRM	3-32-1-K
<hr/>			
3	1-255-1/1-250-3-L	PAINT MIX/ISSUE RM	1-240-1-K
3	2-328-2-L FR 360 (P)	GAS CYLINDER STRM	2-355-2-K

TAB R - AFFF STATIONS

SAMPLE :

<u>DCRS</u>	<u>LOCATION/FRAME</u>	<u>COMPT SERVED</u>	<u>CUT-OUT VALVES</u> <u>REMOTE ACT</u>
5	2-136-01-L	MAIN ENGINE ROOM 5-210-0-E	2-156-3

TAB S - DESMOKING PROCEDURES

STANDARD METHODS

FROM	VIA	TO
1. Compartment #	WTD - Passageway	Portside weather deck
	WTD - Passageway	WTD -
	WTD -	
2. Compartment #	WTD - Passageway	Starboard weather deck
	WTD - Passageway	WTD -
	WTD - Passageway	
	WTD - Passageway	WTD -

ACTIVE DE-SMOKING METHODS (SEE ref (c), Section 7.7)

FROM	VIA	TO
1. Compartment #	WTD - Passageway	Portside weather deck
	WTD - Passageway	WTD -
2. Compartment #	WTD - Passageway	Starboard weather deck
	WTD - Passageway	WTD -
	WTD - Passageway	
	WTD - Passageway	WTD -

TAB T - TOXIC GAS BILL

See reference (h).

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CHAPTER 5 - SHIP STABILITY AND FLOODING CONTROL

SECTION 1 - REQUIRED INFORMATION

- Ref: (a) OPNAVINST 3120.32 Standard Organization and Regulations of the U.S. Navy (SORM)
(b) NWP 3-20.31, (series) Surface Ship Survivability
(c) NSTM Chapter 079, V1, Stability and Buoyancy
(d) Ship's Damage Control Book
(e) OPNAV P-03C-01-89, U.S. Navy Cold Weather Handbook for Surface Ships

5100 REQUIRED CHAPTER TAB.

- a. TAB A, Strip Ship Bill
- b. TAB B, Jettison Bill
- b. TAB C, Modified Zebra Bill

c.

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SECTION 2 - Required and Available Stability

5200 STABILITY.

a. Every crewmember should be confident in the ship's ability to survive severe weather conditions and massive amounts of damage in moderate sea conditions. For the ship to have its required stability and reserve buoyancy both before and after damage, the following limitations must be observed:

(1) The limiting drafts specified in reference (d), section II (a), are not submerged before damage.

(2) There are no excessive or unusual topside weights or deck loads, such as icing.

(3) The liquid and dry cargo loading instructions contained in reference (d), section II (a), and Damage Control Diagram 1 (Liquid Loading Diagram) are followed.

(4) A proper degree of watertight integrity is maintained. (Watertight fittings are effectively maintained and personnel are adequately trained to set the required material condition.)

b. The DCA shall determine the ship's stability and complete a draft report at least daily and following any major alteration to the ship's loading. If the liquid and dry cargo loading instructions are followed, only the drafts, trim, and displacement need to be determined. If these instructions are not followed, the DCA must also calculate the position of the center of gravity (KG) and Metacentric Height (GM). All values shall be compared to the acceptable limits prescribed in the reference (d), Section II (a).

5201 PROCEDURES AFTER DAMAGE.

a. Reference (d), section II (a), provides detailed instructions and procedures to be followed in the event of damage. The following is a generic sequence of events:

(1) Isolate the flooding

(a) Set flooding boundaries

(b) Electrically isolate affected space(s)

(c) Mechanically isolate affected space(s)

(2) Determine impact of flooding and prioritize de-watering efforts

(a) De-water spaces colored pink on the Flooding Effects Diagram.

(b) De-water spaces which have the greatest Free Surface Effect first.

(c) Use locally prepared stability data cards, if applicable, to assess impact of flooding. May wish to mention the Flooding Casualty Control Software as a means to evaluate stability and assess the impact of flooding.

(3) Evaluate Critical Stability

NOTE: Stability is critical when immediate improvement is necessary to avoid loss of the ship. Stability should be considered critical if any or all of the following conditions exist:

(a) Small or negative metacentric height

1. The ship is lopy, with a slow erratic roll period and a tendency to hang at the end of the roll.

2. The ship has a tendency to list at the same angle to either side.

3. The ship has a list that cannot be accounted for by off-center weight.

(b) Approach or exceed floodable length

1. The extent of flooding approaches or exceeds the maximum amount of flooding tabulated in reference (d), section II (a).

(c) List exceeds danger angle

1. Generally, the ship lists to a static heel more than the danger angle (varies with ship class, consult references (b), (c), and (d)).

(d) Heavy winds and seas combined with flooding damage

1. Heavy winds and rough seas are prevailing or are anticipated.

(4) If Stability is Critical (see table 1).

(a) If freeboard is adequate, completely fill those compartments which will improve stability when flooded solid. (Yellow or green compartments on the Flooding Effects Diagram.)

(b) Eliminate free surface effect by de-watering or filling partially flooded compartments. (See Flooding Effects Diagram).

(c) Strike down solid weights, such as ammunition, from upper deck handling rooms to magazines. (See Jettison Bill).

(d) Ballast tanks according to the ship's Liquid Loading Instruction.

(e) Favor stability in the handling and maneuvering of the ship. Limit speed and rudder angle to reduce dynamic forces.

(f) If the ship has a small or negative metacentric height or is approaching or exceeds floodable length conditions, jettison topside weights per Chapter 5 TAB B. This is difficult but urgent. Concentrate on heavy items and plan ahead considering the effect of removing various items.

Critical Thumb Rule	Actions to be Taken
Negative GM	<u>FLB</u> , Eliminate FSE/FCE, Shift Weight Down, Add Weight Low, Remove Weight High (Symmetrically)
Flooding Exceeds Floodable Length	<u>FLB</u> , De-Water, Shore Holes and Bulkheads
List to the Danger Angle	<u>FLB</u> , Determine Cause of List, Correct for - GM, Correct for Off-Center Weight
Damage with Bad Weather	<u>FLB</u> , Maneuver Ship Out of Weather, Repair Damage

Table 1

NOTE: FLB - Flooding Boundary

(5) Determine and Eliminate unusual List

(a) List caused by off-center flooding only:

(1) Counter-balance on the high side to reduce the list. Add only that amount that would correct for one-half the list, evaluate the effect of this action and then proceed to correct the list.

(b) List caused by negative metacentric height only:

(1) DO NOT add weight to the high side to correct for this list. Take action to lower the ship's center of gravity by ballasting low tanks symmetrically, jettisoning topside weight symmetrically, shifting low weight symmetrically, and at all times suppressing free surface effect.

(c) List caused by a combination of off-center loading and negative metacentric height:

(1) First, take all corrective actions listed above to restore positive GM. Second, correct for off-center flooding.

5202 EFFECTS OF FIRE FIGHTING WATER.

a. Fire Fighting water has the same affect on the ship as an equivalent amount of flooding water for any given space, hence, the use of fire fighting water within the ship must used judiciously, particularly if:

(1) Stability is already in jeopardy.

(2) The fire fighting water is being used high in the ship.

(3) Filling the space partially with water negatively contributes to stability.

b. When fire-fighting water is used, it must also be removed. Note: A single 1 1/2 hose can add over 2 tons of water in five minutes to a space. Four hoses working for 30 minutes can add 50 tons to the ship.

5203 PREVENTION.

When in a high threat environment the CO may set Modified Zebra using CHAPTER 5, TAB C.

TAB A - STRIP SHIP BILL

See reference (a)

TAB B - JETTISON BILL

See references (a) and (d).

TAB C - MODIFIED ZEBRA BILL

Ship provide insert.

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CHAPTER 6 - REPAIRING DAMAGE IN ACTION

SECTION 1 - Required Information

- Ref:
- (a) NWP 3-20.31, Surface Ship Survivability
 - (b) NSTM Chapter 079, V2, Practical Damage Control
 - (c) NSTM Chapter 079, V3, Engineering Casualty Control
 - (d) NSTM 300, Electric Plant - General
 - (e) Ship's Damage Control Book
 - (f) Ship's Damage Control Plates (Diagrams)

6100 REQUIRED CHAPTER TABS.

- a. TAB A, Casualty Power Bill.
- b. TAB B, Casualty Power Checklist.

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SECTION 2 - SHORING

6200 USE OF SHORING

a. Shoring is the process of placing supports against the side of, beneath or above a structure to prevent metal fatigue, sagging and bulging. Ships have often needed to support ruptured decks, build up temporary bulkheads and decks against the sea to support hatches and doors, and provide supports for equipment that has broken loose. This is accomplished largely by shoring. For additional information regarding shoring procedures, see reference (b).

6201 WHEN TO SHORE.

a. Shoring should not be immediately initiated after flooding damage. Ships are designed with inherent structural strength to resist the effects of flooding. All principal transverse and longitudinal structural bulkheads and all watertight decks are designed to withstand the maximum static pressure, which any flooding can conceivably produce. If the bulkhead or deck has been properly preserved, this pressure may result in deformation, but there will be no serious threat of failure. One or more of the following may cause bulkhead failure:

(1) If the structure is old, it may have been weakened by corrosion.

(2) The damage itself may cause some local structural weakening. This is particularly likely for structures close to an explosion.

(3) Static pressure from flooding may be exacerbated by dynamic pressure resulting from ship's movement, speed or behavior in a seaway.

NOTE: Unless one or more of the above conditions exist, there should be no reason to shore.

b. Exercise good judgment when inspecting the damaged area. Deep bulges in plating, bowed frames and stanchions, cracked seams and panting bulkheads indicate the need for shoring. Panting is a dangerous condition; it results in metal fatigue that eventually causes cracking and splitting.

c. Carefully inspect equipment located near damage. Weakened supports under guns and machinery may not be readily noticed. These must be shored so further operation will not make the problem worse.

d. Because of ship construction, each shoring configuration will be different. Many shoring situations require the removal of interferences such as equipment, ventilation ducting or even cableways. DCC must approve and coordinate interference removal to avoid further damage or impact on other damage control evolutions in progress.

e. When in doubt, shore!

6202 FUNDAMENTAL RULES OF SHORING.

a. Distribute pressure evenly on the bulkhead or deck (i.e. not concentrated at one or two points).

b. Several shores exerting pressure perpendicular to the bulkhead must back up each horizontal strong back.

c. The butt end of shores must be secured against strong, undamaged structures. Hatches, stanchions, machinery foundations, frames, girders, and armored decks may be used as anchor points. It may be necessary to build a complicated structure to reach from a bulkhead to a strong support.

d. A flooded compartment subjects the deck, all bulkheads and possibly the overhead to pressure. Consider shoring the entire containing structure with priority given to the weakest or most pressured bulkhead.

e. Pressures vary on bulkheads as the ship- and the liquid inside the compartment moves. The pressure fluctuates and tends to separate the bulkhead and shoring. No shoring job is complete until all slack is taken up and a continuous shoring watch is posted to tighten wedges as they work loose. Shoring is intended to SUPPORT warped bulkheads, not PUSH them back into shape. Excessive shoring pressure may cause a bulkhead to collapse or rupture.

SECTION 3 - CASUALTY POWER SYSTEMS

6300 CASUALTY POWER SYSTEM.

a. Ships are designed with an installed casualty power system that enables repair party personnel to quickly respond to a damaged electrical distribution system and provide temporary emergency power to equipment considered vital to ship survivability. This system eliminates the need for time-consuming cable tracing, cutting, and splicing. The system's components include permanently installed vertical risers, bulkhead and switchboard terminals, and portable pre-staged cables and switches. Features of the casualty power systems are:

- (1) Preservation of watertight integrity.
- (2) Simplicity of installation and operation.
- (3) Flexibility of application.
- (4) Interchangeability of parts and equipment.

6301 CASUALTY POWER BILL.

a. In a damaged condition, the timely and effective response of the ship's repair parties to rig casualty power is vital. Never sacrifice safety for speed. Experience shows that well trained repair parties who know the systems and have practiced for emergencies will be able to rig casualty power safely and with dispatch. Conversely, unprepared/untrained repair parties lose critical hours in getting organized. Tables of normal, alternate, and emergency electrical sources, vital loads, casualty power bulkhead and riser terminals, ABTs and MBTs are included in refs (e) and (f) (Vital Load Charts and Casualty Power Diagrams: normally Plates 13 and 14). Preplanned casualty power cable routes shall be developed and included in the Chapter 6, Tab A as the ship's Casualty Power Bill.

6302 PROCEDURE FOR RIGGING CASUALTY POWER.

a. Ensure that power is NOT available at the damaged panel or switchboard by tagging out all applicable sources of power IAW ship's instructions.

b. Ensure that all power supplies are tagged open. If a type "K" switch is installed on the panel, OPEN IT.

c. Make sure that there are no short circuits in the panel or equipment. If supply cables are damaged and no switch is available, disconnect the leads.

d. The Engineer Officer will designate the source switchboard and riser.

e. The casualty power cables should then be taken from their stowage racks and laid out, ready for connecting.

f. IAW reference (d), All personnel making connections must wear proper PPE and observe all safety precautions: 7500-volt rubber gloves, rubber boots or a rubber mat and de-metalization.

g. Connect all horizontal cables LOAD to SOURCE starting with the riser or bulkhead terminal at the casualty (load) and work toward the switchboard (source) riser or bulkhead terminal entering the compartment from which power will be supplied.

h. Test, then connect, the damaged equipment to the riser or bulkhead terminal leaving the compartment. (The damaged equipment should be the next to last thing connected after all intermediate connections, followed by the source.)

i. ONLY WITH CO'S PERMISSION will use of the riser terminal be used as a connection block when the other end of the riser is to supply some piece of equipment.

j. Install a portable switch (if applicable; some ships may have newer one piece connectors) in the line near the casualty to kill power in the event of an emergency (e.g. class "C" fire), or for reversing leads to correct phase rotation.

k. When all cables have been connected (including the horizontal connections) to the panel or equipment to be energized, inform DCC.

l. The DCA will request that the Bridge pass the word, "Stand clear of casualty power cables rigged between frames ____ and ____" (every 5 minutes)

m. When the operator of the designated switchboard (or Repair Electrician) receives word from Main Engine Control to "Rig and energize casualty power cables," the operator shall perform the following:

(1) Test the bulkhead terminal and rig that end ONLY.

(2) Rig the cable to the switchboard terminal after checking to make sure the switchboard casualty power circuit breaker is open.

(3) Test the casualty power terminal in the switchboard to make sure the terminal is de-energized.

(4) Momentarily close and open the casualty power switch to test the casualty cable run then close the switch again.

Note: This could prevent both serious injury to someone still working on the casualty cable run and damage to the cables.

n. Report to Main Control, "Casualty power riser (or bulkhead terminal) rigged and energized." Main Control then notifies DCC.

o. Ensure that motor rotation is in the correct direction. If not, de-energize the circuit at the portable switch (if installed) and reverse any two of the three leads. (If no switch is installed, reversing the leads can be done inside the motor controller.)

6303 PROCEDURES FOR SECURING CASUALTY POWER.

a. The DCA will instruct Main Control to "De-energize and disconnect casualty power from riser or bulkhead terminal."

b. The switchboard electrician will:

(1) Open the casualty power circuit breaker on the switchboard.

(2) Test to ensure the circuit is de-energized.

(3) Disconnect the casualty power cable from the riser (or bulkhead terminal) leading from the switchboard compartment.

(4) Disconnect the casualty power cable from the switchboard terminal.

(5) Report to Main Control, "Casualty power de-energized and disconnected from riser (or bulkhead terminal) _____."

c. Main Control will notify DCC.

d. DCC will direct the repair party to unrig and restow casualty power cables.

. e. Procedures for unrigging casualty power cables:

(1) De-energize all casualty power to affected equipment and disconnect cable at the source.

(2) Test each connection block to make sure it is de-energized before removing the cable.

(3) Disconnect cable at the casualty.

(4) Re-connect previously disconnected normal power leads.

(5) Re-energize the load normally.

(4) Disconnect horizontal cable runs.

NOTE: When disconnecting the older style terminals, keep the leads separated between fingers of the rubber glove. When the three leads are free, they shall be dropped to the deck, making sure that no personnel are in the immediate area. The operator shall turn his/her head away from point of contact of cable with deck to avoid injury.

f. After the casualty has been repaired and the casualty power cables have been unrigged, the repair party(s) will notify DCC.

g. The DCA will inform the Engineer Officer who will then direct the energizing of appropriate power supply circuits. The Engineer Officer will notify the OOD when the casualty has been repaired and the normal power source has been restored.

TAB A - CASUALTY POWER BILL

The following pages lay out the various routes to be used when rigging casualty power from designated vital equipment to an available power source. The responsible DC repair station and the terminals and cables to be used are listed. Other routes may be used, but those listed below are the "best case scenario" (the shortest available). In case of damage or other obstruction, the DCA will order an alternate route. The DCRS responsible for rigging casualty power is identified in the column on the right.

NOTE: Casualty power can only provide power from one source to one load, regardless of ABT or MBT at the power panel or controller. On some ships certain important equipment (e.g. HPAC, FOTP) may be on a non-vital circuit where there is no casualty power terminal at the power panel. If this equipment is required and can only be operated on casualty power, then casualty power must be rigged directly into the motor controller. This is a special case requiring additional precautions.

TO 1E SWBD:

FROM	VIA	TO	DCRS
#1 Fire Pump	3-18-1 (35)	RT 3-23-1	III

TO 1SA/1SB SWBD:

FROM	VIA	TO	DCRS
RT 3-23-1	2-23-1 (20)	BT 2-23-3	III

TAB B - CASUALTY POWER CHECKLIST

- _____ Identify damaged cables to vital load.
- _____ Open power panel breakers to load and tag them out (OOC).
- _____ Are cables from Normal/Alternate/Emergency power supplies damaged?
- _____ DCO or DCA recommend to CO the rigging of casualty power.
- _____ DCA check vital load DC Plate for Norm/Alt/Emergency power supplies and load circuit breaker numbers.
- _____ DCA order Main Control to open and tag-out load circuit breakers on Norm/Alt/Emergency power supplies.
- _____ DCO designate source and source riser.
- _____ DCA designate casualty power route according to Casualty Power Bill.
- _____ Repair electrician disconnect power feeders from load power panel.
- _____ Repair personnel rig from load riser to source riser.
- _____ Rig from load power panel terminal to load riser (install K switch between load power panel and riser).
- _____ Switchboard watch rig from source riser to source terminal (make sure casualty power breaker is open and de-energized).
- _____ Bridge passes word "Stand clear of casualty power cables rigged between frames ____ and ____" (every 5 minutes).
- _____ DCA give permission to flash test switchboard watch momentarily energize casualty power breaker.
- _____ DCA gives permission to energize cables.
- _____ Repair electrician operationally test the load.

NOTE: if situation exists for more than 24 hours, invoke a temporary standing order.

CHAPTER 7 - CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL DEFENSE

SECTION 1 - REQUIRED INFORMATION

- Ref: (a) NWP 3-20.31, (series) Surface Ship Survivability
(b) NSTM Chapter 070, Radiological Recovery of Ships after Nuclear Weapons Explosions
(c) NSTM Chapter 470, Shipboard BW/CW Defense and Countermeasures
(d) NAVMED P-5041, Treatment of Chemical Agent Casualties and Conventional Military Chemical Injuries
(e) NAVMED P-5059 NATO Handbook on the Medical Aspects of NBC Defense Operations

7100. REQUIRED TABS.

- a. TAB A, Self Aid for Nerve Poisoning
- b. TAB B, Self-Aid for Blistering Agent
- c. TAB C, Self-Aid for Blood Agent
- d. TAB D, Self-Aid for Choking Agent
- e. TAB E, CBR-Defense Bill

NOTE: The CBR Defense Bill provides important, time sensitive information to the entire damage control organization.

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SECTION 2 - CHEMICAL WARFARE

7200 CLASSIFICATION OF CHEMICAL AGENTS.

a. The following are a brief description of the common types of chemical agents.

(1) Nerve agents inhibit a chemical neurotransmitter called cholinesterase enzyme, disrupting the normal transmission of nerve impulses.

(2) Blister agents produce pain and injury to the eyes, reddening and blistering of the skin, and when inhaled, damage to the mucous membranes and respiratory tract. Some blister agents like mustard may produce major destruction of the top (epidermal) layer of skin.

(3) Lung-damaging agents (choking agents) injure the lungs and irritate the eyes and respiratory tract. They may also cause uncontrollable pulmonary edema and predispose to secondary pneumonia.

(4) Blood agents are transported by the blood to all body tissues where the agent blocks the oxidative processes, preventing tissue cells from utilizing oxygen. This leads to respiratory and cardiovascular failure.

7201 CHEMICAL AGENT CONTAMINATION, DETECTION AND IDENTIFICATION.

a. Identification of chemical agents will greatly assist the diagnosis and treatment of injuries. The following are means of detecting and identifying chemical agent contamination.

(1) Chemical agent detector paper or tape can be used to detect/identify liquid chemical agents.

(2) The VGH ABC-M8 Chemical Agent Detector Paper can be used to detect and identify liquid V- and G-type nerve agents and H-type blister agents. It does not detect chemical agent vapors. Some solvents and standard decontaminating solutions cause the M8 paper to falsely react positive.

(3) The M9E1 Chemical Agent Detector Paper (tape) (which can be worn on the uniform) detects liquid nerve agents (V and G) and blister agents (H/HD, HN, and L). M9 paper will detect the presence of agent(s); it can neither distinguish between agent types nor detect chemical agent vapors. Extremely high temperatures, scuffs, or certain types of organic liquids and decontaminating solution number 2 (DS2) cause the M9 paper to falsely react positive. (DS 2 is not authorized for use on Naval vessels.) M9 paper is much more sensitive than M-8 paper.

b. Installed automatic chemical agent alarm systems, such as the Chemical Agent Point Detection System (CAPDS) and the Improved (Chemical Agent) Point Detection System (IPDS), detect agent aerosol and vapor contamination consistent with their designed specifications and operational limitations.

c. Portable detection devices, such as the M256 Chemical Agent Detector Kit, the Shipboard Automated Chemical Agent Detector and Alarm (ACADA) and the Joint Chemical Agent Monitor (JCAD)(future fielding), detect and identify vapor concentrations of nerve, blister, and blood agents. Shipboard ACADA does not detect blood agents. Chocking agents can be detected by using chemical detector tubes carried for gas free engineering purposes.

7202 EMERGENCY PERSONNEL DECONTAMINATION.

a. Chemical agent contamination of the skin should be neutralized and removed with the M291 Skin Decontamination Kit (SDK).

b. Procedures for Decontamination Kit Use:

(1) M291 Skin Decontamination Kit (SDK)

(a) Open the kit container and remove a mylar packet.

(b) Tear open the mylar packet and remove the decontamination pad. Unfold the pad and place two fingers inside the strap, with the pad on the inside of the hand. Lightly pat the contaminated area until it is covered with the dark granules. Gently rub the area toward the center. Discard the used decontamination pad.

NOTE: Detailed procedures for decontaminating the eyes are found in ref (d).

c. Any suspected chemical agent contamination of your eyes or face must be removed immediately. In most cases, you will not be able to identify the agent before decontamination. Quickly obtain overhead shelter to protect yourself while performing the following:

- (1) Remove and open your canteen.
- (2) Take a deep breath and hold it.
- (3) Lift your mask away from your face. Do not take the mask off.
- (4) Flush (irrigate) your eye or eyes immediately with copious amounts of water. To irrigate the eyes with water (from a canteen or other container of uncontaminated water) tilt your head to one side, open the eyelids as wide as possible, and slowly pour water into the eye so that it will run off the side of your face to avoid spreading the contamination. DO NOT use your fingers or gloved hand to hold the eyelids apart. You must irrigate your eyes despite the presence of toxic vapors in the atmosphere. Hold your breath and keep your mouth closed to prevent contamination and absorption through the mucous membranes. Neutralize chemical agent residue along the flush path on the face.
- (5) Reseal, clear, and check your mask. Then resume breathing.
- (6) If your skin is contaminated while flushing your eyes, then decontaminate your face.
- (7) Thoroughly scrub exposed skin of face until completely covered with black powder from the applicator pad.
 - (a) Hold breath, close eyes, grasp mask beneath chin, and pull hood and mask away from chin enough to allow one hand between the mask and your face. Hold mask in this position during steps (b) through (f).
 - (b) Scrub up and down across face beginning at front of one ear to nose to other ear.
 - (1) Scrub across face to corner of nose.

(2) Scrub extra stroke at corner of nose.

(3) Scrub across nose and tip to other corner of nose.

(4) Scrub extra stroke at corner of nose.

(5) Scrub across face to other ear.

(c) Scrub up and down across face beginning where step (b) ended, to mouth to other end of jawbone.

(1) Scrub across cheek to corner of mouth.

(2) Scrub extra stroke at corner of mouth.

(3) Scrub across closed mouth to center of upper lip.

(4) Scrub extra stroke above upper lip.

(5) Scrub across closed mouth to other corner of mouth.

(6) Scrub extra stroke at corner of mouth.

(7) Scrub across cheek to end of jawbone.

(d) Scrub up and down across face beginning where step (c) ended, to chin and to other end of jawbone.

(1) Scrub across the under jaw to chin, cupping chin.

(2) Scrub extra stroke at center of chin.

(3) Scrub across the under jaw to the end of the jawbone.

(e) Turn your hand out, and quickly wipe the inside of the mask that touches your face.

(1) Discard applicator pad.

(2) Immediately seal mask, clear, and check seal.

- (8) Remove second skin decontaminating packet from carrying pouch.
- (9) Tear open quickly at notch.
- (10) Remove applicator pad from packet, and discard empty packet.
- (11) Unfold applicator pad and slip finger(s) into handle.
- (12) If you were already masked when you became contaminated and skipped steps i through m, continue using the same applicator pad. Without breaking the seal between the face and mask, thoroughly scrub skin of neck and ears until completely covered with black powder.
- (13) Redo hands until completely covered with black powder.
- (14) Discard applicator pad.
- (15) Put on your protective gloves.
- (16) Fasten hood.
- (17) Remove powder with soap and water when operational conditions permit. It does not matter how long the powder stays on your skin.

7204 DIAGNOSIS OF NERVE AGENT POISONING.

a. Nerve agent poisoning may be identified from the characteristic signs and symptoms. If exposure to vapor has occurred, the pupils will be very small, usually pinpointed. If exposure has been cutaneous, or has followed ingestion of a nerve agent in contaminated food or water, the pupils may be normal or, in the presence of severe systemic symptoms, slightly to moderately reduced in size. In this event, one must rely on other symptoms of the nerve agent poisoning for proper diagnosis. No other known chemical agent produces muscular twitching and fasciculation, rapidly developing pinpoint pupils, or the characteristic train of muscarinic, nicotinic, and CNS manifestations.

b. It is important that all service members know the following MILD and SEVERE signs of nerve agent poisoning. Service members who have most or all of the symptoms listed below must IMMEDIATELY receive first aid (self-aid or buddy aid).

(1) MILD poisoning (self-aid). Casualties with MILD symptoms may experience most or all of the following:

- (a) Unexplained runny nose.
- (b) Unexplained sudden headaches.
- (c) Sudden drooling.
- (d) Difficulty seeing (dimness of vision and miosis).
- (e) Tightness in the chest or difficulty breathing.
- (f) Localized sweating and muscular twitching in the area of the contaminated skin.
- (g) Stomach cramps.
- (h) Nausea with or without vomiting.
- (i) Tachycardia (fast heartbeat) followed by bradycardia (slow heartbeat).

(2) SEVERE symptoms (buddy aid). Casualties with SEVERE symptoms may experience most or all of the MILD symptoms, plus most or all of the following:

- (a) Strange or confused behavior.
- (b) Wheezing, dyspnea (difficulty breathing) and coughing.
- (c) Severely pinpointed pupils.
- (d) Red eyes with tearing.
- (e) Vomiting.
- (f) Severe muscular twitching and general weakness.

- (g) Involuntary urination and defecation.
- (h) Convulsions.
- (i) Unconsciousness.
- (j) Respiratory failure.
- (k) Bradycardia (abnormally slow heartbeat).

NOTE: Casualties with severe symptoms WILL NOT be able to treat themselves and MUST RECEIVE prompt buddy aid and prompt follow-on medical treatment if they are to survive.

c. Casualties with MODERATE poisoning will experience an increase in the severity of most or all of the MILD symptoms. Especially prominent will be fatigue, weakness, and muscle fasciculation. The progress of symptoms from MILD to MODERATE indicates either inadequate treatment or continuing exposure to the agent.

7205 SYMPTOMS OF BLISTERING AGENT.

a. Blister agents will likely be used to produce casualties and force opposing troops to wear full protective equipment. Blister agents are used to degrade fighting efficiency rather than kill, although exposure to such agents can be fatal. Blistering agent include sulphur mustard (H and HD), nitrogen mustards (HN), lewisite (L), and haologenated oximes (such as phosgene oxime (CX)). The following symptoms are for the sulphur mustard (HD) agents. For symptoms of all blistering agents see reference (d).

b. In a single exposure, the eyes are more susceptible than either the respiratory tract or the skin to mustard. Symptoms are swelling of eye and/or corneal damage.

c. Ingestion of mustard produces puss and swelling of the lining of the gastrointestinal tract, with eventual hemorrhaging. Absorption of the mustard from the intestinal lumen results in damage to the blood-forming organs such as bone marrow, lymph nodes, and spleen. Such damage will induce blood disorders such as leukopenia, thrombocytopenia and anemia.

d. Inhalation of mustard vapor causes damage primarily to the lining of the lungs. The lesion develops slowly after exposure. A single exposure to a small amount of mustard vapor ordinarily does not produce significant injury. More exposure received will result in more lung damage ultimately leading to respiratory failure.

7206 SYMPTOMS FOR BLOOD AGENT.

a. Inhalation is the usual route of entry for blood agents. Examples of blood agents are hydrogen cyanide (AC) and cyanogen chloride (CK). All blood agents are nonpersistent (agents disperse rapidly).

b. Hydrogen cyanide

- (1) Sudden stimulation of breath
- (2) Odor of bitter almonds

c. Cyanogen chloride

- (1) Irritation of eyes, nose, or throat

7207 SYMPTOMS OF CHOKING AGENT.

a. Choking agents are classified as lung-damaging agents. They include phosgene (OG), diphosgene (DP), chlorine (CL₂), and chloropicrin (PS). The most well known of these agents is OG. Persons exposed to OG need not be withdrawn during combat, unless signs of pulmonary distress appear. Following are examples of symptoms. For a complete list see ref (d).

- (1) Coughing
- (2) Choking
- (3) Feeling of tightness in the chest
- (4) Nausea
- (5) Vomiting
- (6) Headache
- (7) Lacrimation

TAB A - SELF AID FOR NERVE POISONING

_____ IMMEDIATELY DON protective mask and hood at the first signs of a chemical attack.

_____ Stop breathing, put on your mask, clear and seal the mask, and resume breathing. Secure the mask hood. The mask and protective clothing are worn until the "all clear" signal is given.

NOTE: All liquid nerve agents must be removed from the skin and/or clothing as described in section 7202 before donning the over garment.

_____ Identify your symptoms of nerve agent poisoning from section 7204.

_____ Administer one atropine injection and one 2-PAM-Cl injection into the outside mid-lower part of the thighs.

_____ Wait 10-15 minutes. During this time the mild nerve agent poisoning symptoms should diminish, or the signs of atropinization will appear (rapid pulse, dry mouth, dry skin).

_____ Repeat self-administration IF no change in symptoms. Use the 2nd atropine injector and the 2nd 2-PAM-Cl injector.

_____ Wait 10-15 minutes. If no change in symptoms, repeat procedure with 3rd and last atropine and 2-PAM-Cl.

_____ If situation permits, proceed to decon/triage area.

BUDDY AID FOR NERVE AGENT

_____ Correctly identify the severe symptoms of nerve agent exposure in another individual, and determine if the individual is able to administer self-aid.

_____ If vapor hazard still exists make sure the casualty's mask is properly adjusted and sealed to the extent practical.

_____ Locate the casualty's atropine and 2-PAM-Cl automatic injectors. DO NOT USE YOUR INJECTORS!

- _____ Inject the casualty with all 6 injections (or the remainder).

- _____ Move the casualty to a triage area or decon/treatment station as soon as practical. Buddy aid may be performed en route and at the decon station if the situation warrants.

- _____ Artificial respiration is required when the diaphragm and intercostals muscles are stimulated to exhaustion resulting in a physical inability to breathe. DO NOT perform in a chemical hazard environment.

TAB B - SELF AID FOR BLISTERING AGENT

- _____ Set MOPP 4 when liquid or vaporized agents are known to be present.
- _____ Liquid vesicants in eyes or on skin require immediate decontamination.
- _____ Perform section 7202 (Emergency Personnel Decontamination).
- _____ Go to triage/decon area as soon as practical.

TAB C - SELF AID FOR BLOOD AGENT

___ IMMEDIATELY don protective mask while holding breath.

NOTE: Speed is absolutely essential; the effects of this agent are so rapid that within a few seconds you will not be able to don your mask.

___ Go to triage/decon area as soon as practical.

BUDDY AID FOR BLOOD AGENT

___ IMMEDIATELY don your protective mask while holding your breath.

___ If nearest person is unable to don their protective mask, help them.

___ Take buddy to triage/decon area.

TAB D - SELF AID FOR CHOKING AGENT

- ___ IMMEDIATELY don protective mask.
- ___ Move out of contaminated environment, if possible.

BUDDY AID FOR CHOKING AGENT

- ___ IMMEDIATELY don your protective mask while holding breath.
- ___ If nearest person is unable to don their protective mask help the person.
- ___ Take buddy to triage/decon area. Have victim remain seated in an upright position while awaiting treatment. Do not lie victim down.

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SECTION 3 - BIOLOGICAL WARFARE

7300 BIOLOGICAL WARFARE.

a. Biological agents can be divided into two general classes: pathogens and toxins. A pathogen is a microorganism that causes disease in humans, animals or plants. A biological toxin is an organic substance that is poisonous to humans or animals. Toxins are not living organisms. When a biological agent is used against a ship, the purpose is to render the crew unable to effectively carry out the ship's mission.

7301 DETECTION OF BIOLOGICAL ATTACK.

a. Interim Biological Agent Detection System (IBADS) is an installed sensor that provides point detection of several airborne biological warfare agents on a near real-time basis. The IBADS continuously samples outside air and detects changes in the amount of airborne particles in several size ranges. When a suspicious increase occurs in the number of particles of respirable size, IBADS prepares a sample for testing to identify the biological agent. The number of IBADS available is currently limited.

b. Biological survey is another method of detection. If a biological attack is suspected because of a large number of breakouts or other indications, biomedical and environmental samples can be collected and sent to laboratories. The Medical Department is responsible for biomedical samples. Repair Party Monitoring Teams perform environmental samplings. For detailed instruction on biological sampling and surveying see ref (c).

c. The Dry Filter Unit (DFU) is an environmental air sampling system designed to be used with Biological Agent Assays and Confirmatory Laboratories to provide a "Detect to Threat" capability for Naval Forces ashore and afloat. The DFU system may be utilized for external or internal air sampling. It may be portable or fixed and may be installed on ships' or buildings' vent systems.

7302 CONFIRMATION OF BIOLOGICAL ATTACK.

a. Positively determining that a biological attack has occurred is difficult. It is normal for a small percentage of the crew to be ill from naturally occurring pathogens. Occasionally, there are outbreaks of illness that affect more personnel. This, too, could be attributable to natural causes, but the following developments could indicate that a biological warfare agent is responsible.

b. The number of casualties reaches epidemic portions within hours to three days, most within a 24-hour period.

c. The infection rate or death rate is higher than normally expected for the disease.

d. A disease outbreak occurs that is not normally encountered in the area of the world where the ship is operating.

e. Personnel working in a protected environment do not contract the disease.

f. Outbreak of multiple diseases occurs.

NOTE To confirm that a biological attack was responsible, samples collected by a biological detection system, environmental samples collected by repair parties or biomedical samples collected by medical personnel are crucial.

7303 PROTECTION FROM BIOLOGICAL WARFARE.

a. Proper personal and shipboard hygiene is important defense against both biological weapons and naturally occurring biological organisms. The protective mask is the most important element in biological protection. Most pathogens can enter the body only by inhalation, ingestion or breaks in the skin. With early warning, the chemical protective ensemble (CPE), protective mask, Advanced Chemical Protective Garment (ACPG) boots and gloves provide effective protection against biological warfare agents. Thus, if the CPE is required based on chemical threat, protection against biological agents is provided as well. If the threat is limited to biological agents, use of the ACPG is not warranted. IAW ref (e), standard uniform clothing of good quality offers reasonable protection against biological agent aerosols. Complete body coverage is required if the threat includes toxins. A protective mask is required in any case.

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SECTION 4 - RADIOLOGICAL WARFARE

7400 RADIOLOGICAL WARFARE.

a. A nuclear explosion involves the fission (splitting) of complex radioactive isotopes. These fission fragments are radioactive. This means that these isotopes are unstable forms of certain elements that emit ionizing radiation as they decay to a more stable state. The radiation from fission fragments consists primarily of gamma rays and beta particles. Shipboard instruments are calibrated to measure gamma radiation at the energy levels associated with fallout. The energy levels associated with prompt or initial gamma radiation are higher and not normally measured by the ship's CBR organization. Current shipboard instruments can detect, but not measure, beta radiation.

7401 DETECTION.

a. Human senses are incapable of detecting nuclear radiation, so Radiation Detection, Indication, And Computation (RADIAC) instruments are needed. RADIACs measure different forms of radiation:

(1) AN/PDR-27 is the standard low-range beta-gamma RADIAC set for use in low level surveys and for personnel monitoring. It has a handheld Gamma/Beta probe and an audio output which make the unit ideal for personnel surveys.

(2) AN/PDR-43 is a battery powered, high range, beta-gamma RADIAC set used for low and high level surveys, and possibly personnel monitoring.

(3) AN/PDR-65 is a very high-range gamma survey instrument. Onboard ship it is normally mounted permanently and used with an external probe, but it could be used as portable meter. The primary location for the AN/PDR-65 is the ship's bridge with a second set normally mounted in DCC. For early warning of the arrival and cessation of fallout, the detector unit for the bridge should be mounted on the aft side of the main mast. It should be positioned as high as possible without being located in a radar beam.

(4) AN/PDQ-1 Multi-Function RADIAC (MFR) with OA-9449/PDQ Gamma/Beta Probe measures beta-gamma radiation. This RADIAC is being phased into the fleet as a replacement for AN/PDR 27 and 43. The PDQ-1 may be used without the probe for Gamma surveys. With the probe attached the PDQ-1 may be used for Gamma/Beta survey or personnel surveys.

(5) Dosimeters are devices that measure total dose or exposure. A personal dosimeter measures the accumulated dose of the wearer. There are two types of dosimeter that are commonly used in the military.

(a) IM 143 PD or Self Indicating Pocket Dosimeter is an ionization chamber pocket dosimeter. Measures gamma radiation and X-ray radiation. Since ships are outfitted with only enough for approximately 10% of the crew, these dosimeters should be issued to the senior member of any group of people (e.g. a watchsection,) this person can then be tasked with real time monitoring of the groups dose.

(b) DT-60 is a radioluminescent dosimeter worn like a necklace. Also measures X-ray and gamma radiation. Sufficient quantities should be carried to issue on to every crewmember. The dosimeter must be read using a CP-95/PD RADIAC Computer Indicator, because the dose measured by a DT-60 is cumulative, these dosimeters must be read and logged upon initial issue. Changes in photoluminescence require 18-24 hours to take effect, thus these dosimeters cannot be used for real time management of personnel rotation. An individual's final dose should be read at least 24 hours after leaving a radiological environment.

7402 PROTECTION FROM RADIOLOGICAL WARFARE.

a. Initial nuclear radiation and thermal radiation arrive instantaneously. Other effects arrive sequentially at intervals depending on range to surface. The deposition of fallout may not begin until hours after the detonation and the radiation hazard created by it may last until the ship receives depot level decontamination.

b. Protective clothing and respiratory protection are required in a radiological environment. The MCU-2/P with C-2 canister can be used for respiratory protection, while protective clothing shall consist of durable clothing made from fine weave cloth or a plastic or rubber material. Shipboard work uniforms and battle dress items satisfy this requirement. In wet spray conditions, rain gear shall be worn as the outer layer.

(1) If possible, no one should be allowed topside while the ship is enveloped in the initial blast. In an emergency, personnel topside must have full body coverage and respiratory protection. This will minimize personnel exposure, not guarantee their survival.

(2) All personnel inside the skin of the ship will wear full body coverage and respiratory protection regardless of status of ventilation (i.e. even when Circle William is set). When beta radiation is confirmed absent, full body coverage can be relaxed but the mask shall be worn.

c. To increase the chances of survival for radiological attack utilize the philosophy of time, distance and shielding. Minimize time spent in area of radiation. Individuals should distance themselves from the radiation area (i.e. move ship away from the blast area). As for shielding, stay inside the skin of the ship or in area where large dense material provides protection. Senior members of the Damage Control organization must be proficient in the calculation of Radiation Absorbed Doses to accurately determine stay times and rotation times. See reference (b) for procedures.

TAB A - CBR BILL

Insert applicable Annex per reference (a).

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