



Repair Party for Large Cutters (210 feet & above) Tactics, Techniques, and Procedures (TTP)



Force Readiness Command
(FORCECOM)

CGTTP 3-91.3A
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U.S. Department of
Homeland Security

United States
Coast Guard



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COAST GUARD TACTICS, TECHNIQUES, AND PROCEDURES 3-91.3A

Subj: REPAIR PARTY FOR LARGE CUTTERS (210 FEET & ABOVE) TTP

- Ref:
- (a) Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 2: Damage Control Practical Damage Control, S9086-CN-STM-020 (series)
 - (b) Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 3: Damage Control Engineering Casualty Control, S9086-CN-STM-030 (series)
 - (c) Naval Ships' Technical Manual (NSTM), Chapter 555, Volume 1: Surface Ship Firefighting, S9086-S3-STM-010 (series)
 - (d) Machinery Space Firefighting Doctrine for Class Bravo Fires, COMDTINST M9555.1 (series)
 - (e) Naval Engineering Manual, COMDTINST M9000.6 (series)
 - (f) Surface Ship Survivability, CGTTP/NTTP 3-20.31 (series)
 - (g) Naval Ships' Technical Manual (NSTM), Chapter 074, Volume 3: Gas Free Engineering, S9086-CH-STM-030 (series)
 - (h) Shipboard-Helicopter Operational Procedures Manual, COMDTINST M3710.2 (series)

1. PURPOSE. To provide tactics, techniques, and procedures (TTP) for cutter personnel conducting damage control aboard Coast Guard cutters (CGC). These procedures are scalable and may be used on classes of cutters WMEC and larger in the Coast Guard.
2. ACTION. The provisions of this CGTTP apply to all U.S. Coast Guard cutters WMEC classes and larger. Internet release is authorized.
3. DIRECTIVES/TTP AFFECTED. This publication supersedes Repair Party, CGTTP 3-91.3.
4. DISCUSSION. This TTP publication provides specific organization for ship repair parties, required equipment, and documentation. It is for cutters WMEC and larger and provides examples of items that need to be designed for specific ships.

5. MAJOR CHANGES. This TTP publication uses Adobe Acrobat stamps to indicate revisions. For each revision listed below, there is a stamp in the left margin next to the section with a revision. To display the location of all stamps in the PDF file, select Comments/Show Comments List. Click anywhere in a comment row to move between revisions, or use the scroll bar to scroll through the revisions.

This revision includes the following changes:

- a. Title: Title changed to reflect that this TTP publication is tailored to large CGCs (210 feet and above).
 - b. Chapter 2: Organization, Section B: Duplicate DC Materials for Command, B.1. Overview, revised text.
 - c. Chapter 2: Organization, Section D: Typical DC Organization, revised Figure 2-1.
 - d. Chapter 2: Organization, Section F: Inport Rescue and Assistance (R&A) Bill, F.2 OOD Responsibilities, revised text.
 - e. Chapter 2: Organization, Section G: Underway R&A Bill, G.2 OOD Responsibilities, revised text.
 - f. Chapter 2: Organization, Section H: Alarms, new section.
 - g. Chapter 3: Investigating Damage, Section B: Rapid Response Concept, new section.
 - h. Chapter 5: Firefighting, Section G: Smoke Control, new section.
 - i. Appendix D: Rescue and Assistance Bill, new appendix.
 - j. Appendix E: Checklist for Shipboard Fires, new appendix.
 - k. Appendix F: Additional Resources, new appendix.
6. PROCEDURE. FORCECOM TTP Division posts an electronic version of this TTP publication to the CGTTP Library on CGPortal. In CGPortal, navigate to the CGTTP Library by selecting References, Tactics, Techniques, and Procedures (TTP), and then TTP Library. FORCECOM TTP Division does not provide paper distribution of this publication.
 7. REQUEST FOR CHANGES. Submit recommendations for TTP improvements or corrections by email to: FORCECOM-PI@uscg.mil or through the TTP Request form on CGPortal. In CGPortal, navigate to the TTP Request form by selecting References, Tactics, Techniques, and Procedures (TTP), and then TTP Request.

Info COMCOGARD FORCECOM NORFOLK VA//FC-P// on message traffic containing lessons learned applicable to this TTP publication.

8. RECORDS MANAGEMENT CONSIDERATIONS. Integrated Process Team (IPT) members thoroughly reviewed this publication during the TTP coordinated approval process and determined there are no further records scheduling requirements per Federal Records Act, 44 U.S.C. 3101 et seq., NARA requirements, and Information and Life Cycle Management Manual, COMDTINST M5212.12 (series). This publication does not have any significant or substantial change to existing records management requirements.
9. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS. While developing this publication, Integrated Process Team (IPT) members examined environmental considerations under the National Environmental Policy Act (NEPA) and determined they are not applicable.
10. FORMS/REPORTS. None.

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By Direction of Commander,
Force Readiness Command

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Chapter 1: Introduction

Introduction

This chapter overviews the contents of this tactics, techniques, and procedures (TTP) publication. It also defines the use of notes, cautions, and warnings in TTP publications.

In This Chapter

This chapter contains the following sections:

Section	Title	Page
A	Introduction	1-2
B	Notes, Cautions, and Warnings	1-3

Section A: Introduction

A.1. Overview

Repair party personnel provide the first line of defense in damage control (DC) procedures for all Coast Guard cutters. The commanding officer (CO) of every Coast Guard cutter is responsible for adherence to, and the effective application of, the principles and standards established in this and all damage control publications.

The guidance in this publication is designed to be flexible and adaptable enough to meet anticipated documentation needs. U.S. Coast Guard Force Readiness Command (FORCECOM) will regularly update this publication to ensure it remains current and relevant and provides a framework for standardized repair party procedures.

Section B: Notes, Cautions, and Warnings

B.1. Overview The following definitions apply to notes, cautions, and warnings found in TTP publications.

NOTE: **An emphasized statement, procedure, or technique.**

CAUTION: **A procedure, technique, or action that, if not followed, carries the risk of equipment damage.**

WARNING: *A procedure, technique, or action that, if not followed, carries the risk of injury or loss of life.*

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Chapter 2: Organization

Introduction

This chapter discusses organization and placement of DC personnel and equipment throughout the ship. This organization plan has been developed per the following references:

- Reference (a), Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 2: Damage Control Practical Damage Control, S9086-CN-STM-020 (series).
- Reference (b), Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 3: Damage Control Engineering Casualty Control, S9086-CN-STM-030 (series).
- Reference (c), Naval Ships' Technical Manual (NSTM), Chapter 555, Volume 1: Surface Ship Firefighting, S9086-S3-STM-010 (series).

In This Chapter

This chapter contains the following sections:

Section	Title	Page
A	Required DC Central Equipment, Materials, and Publications	2-2
B	Duplicate DC Materials for Command	2-3
C	DC Organization for Cutters with Two Repair Lockers	2-4
D	Typical DC Organization	2-5
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Section A: Required DC Central Equipment, Materials, and Publications

A.1. Overview

- Liquid loading diagram, updated to reflect the latest tank and void soundings provided by the fuel, oil, and water king (FOWK) and the sounding and security watch.
 - Complete set of DC diagrams.
 - Flooding effects diagram.
 - Clinometers for determining actual list and trim.
 - Damage control book/stability and loading booklet.
 - Tank sequencing chart and/or tables.
 - Closure log when Damage Control Central (DC Central) is manned.
 - List of preplanned routes to ready and deep shelter, combat systems equipment casualty control supply support centers, battle dressing stations, battle messing, and other battle logistics supply centers/storerooms.
 - Charts, nomograms, and other required materials to calculate various radiological factors.
 - Reference (d), Machinery Space Firefighting Doctrine for Class Bravo Fires, COMDINST M9555.1 (series).
 - Chemical, Biological, and Radiological Defense Bill.
 - Repair Party Instruction with this Repair Party TTP, CGTTP 3-91.3.
 - Reference (e), Naval Engineering Manual, COMDINST M9000.6 (series).
-

Section B: Duplicate DC Materials for Command



B.1. Overview

Provide the following DC materials for command:

- To make sure the CO is aware of and can visualize the damage control situation, provide a duplicate set of DC diagrams showing the hull, all decks, and compartments to command control or the pilot house/bridge.
 - The DC diagrams need not be permanently mounted or hard laminated like those in DC Central. Due to space considerations, cut down or modify plates/diagrams as appropriate so long as they remain functional (for cutters required to have them as per reference [e], Naval Engineering Manual, COMDTINST M9000.6 [series]).
 - The damage control assistant (DCA)/engineering petty officer (EPO) makes provisions to provide the bridge or quarterdeck with a copy of the completed repair party manual and DC diagrams for plotting and evaluating damage.
-

Section C: DC Organization for Cutters with Two Repair Lockers

C.1. Personnel Assignments

Personnel assignments:

- Engineering Control Center – damage control officer (DCO)/engineer officer (EO).
- DC Central - DCA/EPO.
- Repair 2 – Repair 2 locker leader.
- Repair 3 – Repair 3 locker leader.

NOTE:

When the repair locker leader is absent, the next senior member of the repair party steps up to assume the role of repair locker leader.

C.2. DC Central Assignments

- DCA (1).
- Phone talker (2).
- Plotter.

C.3. Inport Emergency Team (IET)

During working hours inport, the IET responds to any shipboard casualty. The rest of ship's company musters on the pier and assists as directed by the repair locker leader.

Revision

Section D: Typical DC Organization

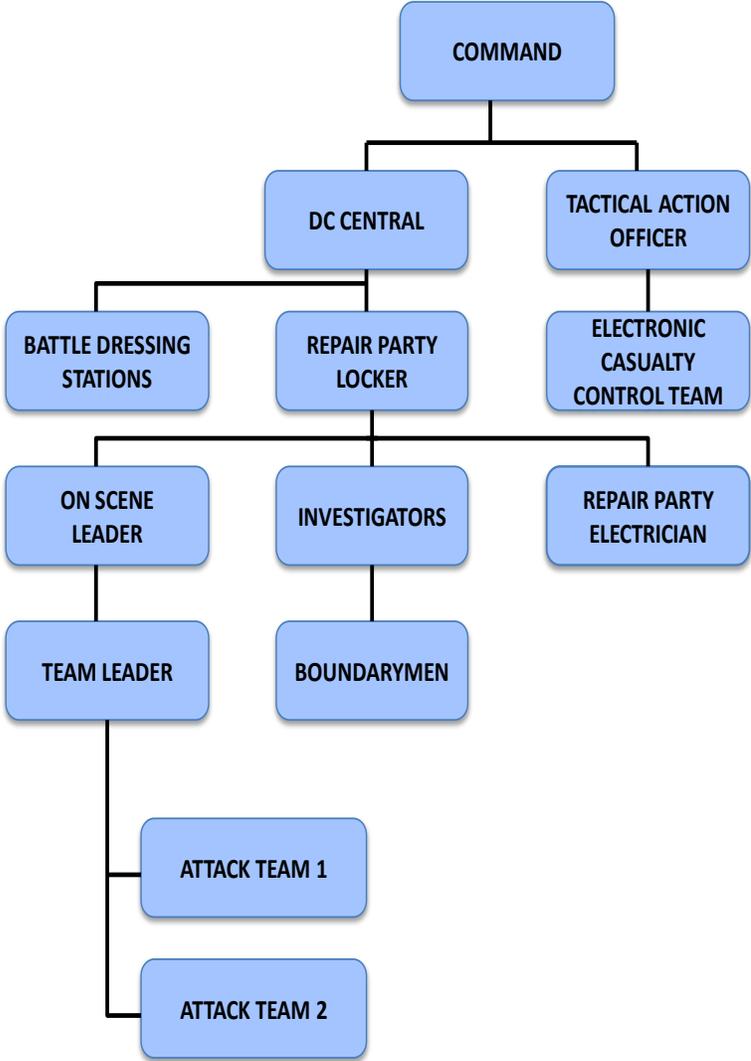


Figure 2-1 Typical DC organization

Section E: DC Response Flow Chart

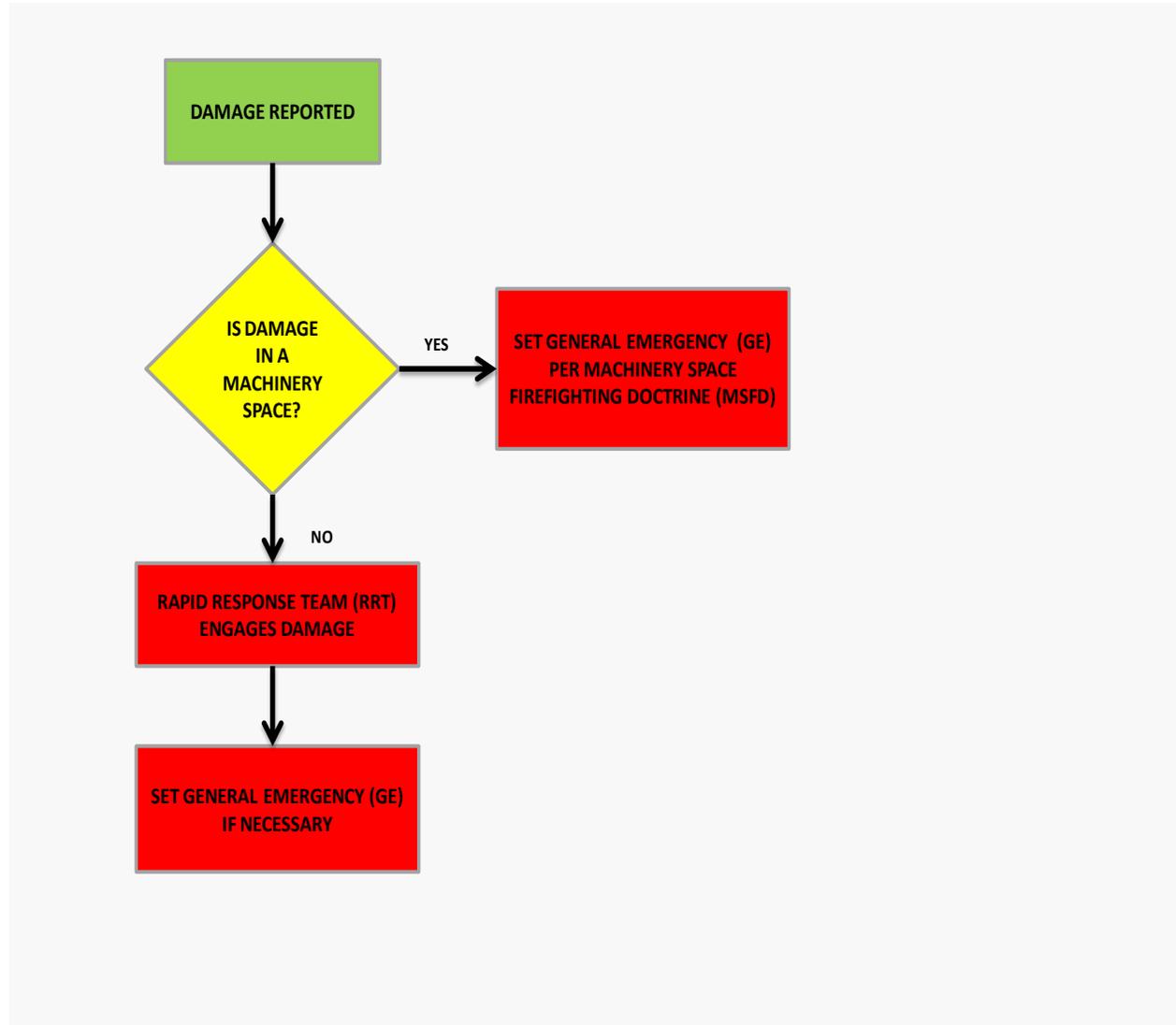


Figure 2-2 DC response flow chart

Section F: Inport Rescue and Assistance (R&A) Bill

F.1. Overview The inport R&A team is compromised from personnel in the duty section.

CAUTION:

The decision to reduce the responding cutter's readiness by sending assistance is the responsibility of the CO or the officer of the deck (OOD).

Revision

**F.2. OOD
Responsibilities**

- Notifies the CO, executive officer (XO), and the EO.
- Informs the engineering officer of the watch (EOW) of the situation.
- Announces over the 1MC circuit: "Now fire/flooding has been reported onboard _____. Away the Rescue and Assistance Detail. All hands in today's duty section not currently on watch, muster on the flight deck." (Or fantail as appropriate.)
- Decides how many members of the duty section respond as the R&A team.
- Conducts a risk assessment brief with all R&A team members.
- Records the names of the R & A Team members in the log.
- Ensures that the unit requesting assistance has notified the senior officer present afloat (SOPA), base OOD, and any other applicable authorities as the situation dictate.
- Organizes vehicle transportation to transport the R&A team and equipment to the scene if applicable.

**F.3. Gangway
Petty Officer of
the Watch
(GPOW)
Responsibilities**

- Assists the OOD as needed.
- Enters the ship's log of all personnel departing the ship as R&A team members.

**F.4. On-Scene
Leader (OSL)
Responsibilities**

- Holds muster and reports manned and ready to the OOD.
- Determines what equipment and personnel are required given the current situation.
- Supervises the staging of equipment required for the situation.

**F.5. R&A Team
Members**

- Muster at the designated repair locker and await direction from the OSL.
- Assemble the necessary equipment and perform services as required by the inport emergency bill.
- Approach, board, and investigate vessels in distress using the utmost caution.
- Maintain communications with the ship by any means available.

NOTE:

It is important that each individual supplies the equipment for which he or she is responsible and not bring any equipment that is the responsibility of others, unless so directed.

**F.6. Other
Personnel**

- Muster on the quarterdeck unless otherwise directed.
 - Remain clear of crewmembers staging equipment, staging areas, and R&A team.
-

Section G: Underway R&A Bill

G.1. Overview The underway R&A team is compromised from personnel in the ship's crew section.

CAUTION:

The decision to reduce the responding cutter's readiness by sending assistance is the responsibility of the CO or the OOD.



G.2. OOD Responsibilities

- Notifies the CO and DCA.
- Informs the EOW of the situation.
- Announces over the 1MC circuit: "Now fire/flooding has been reported onboard (vessel's name) approximately (miles) away. Rescue and Assistance Detail to include (list crewmembers from DCA). Rescue and Assistance Detail muster (location)."
- Announces over the 1MC circuit: "Now fire/flooding has been reported onboard (vessel's name) approximately (miles) away. Boat lowering detail lay to the (location) boat deck, provide from Repair (2/3) as needed."
- Records the R&A team member's names in the Smooth Log.

G.3. DCA Responsibilities

- Decides which crewmembers respond as the R&A team (use input from the OSL and CO).
- Conducts a risk assessment brief with all R&A team members.
- Keeps a log of all communication from the OSL.
- Selects personnel to break out required gear.
- Remains on the bridge to relay information to OOD and CO.

G.4. EOW Responsibilities

- Operates the plant as requested by the OOD and required by the evolution.

G.5. OSL Responsibilities

- Ensures all required equipment is brought to scene.
 - Communicates between the vessel's point of contact (POC) and the DCA.
 - Re-evaluates risk assessment once onboard vessel.
-

**G.6. R&A Team
Members**

- Muster at the designated repair locker and await direction from the OSL.
- Assemble the necessary equipment and perform services as required by the inport emergency bill.
- Approach, board, and investigate vessels in distress using the utmost caution.
- Maintain communications with the ship by any available means.

NOTE:

It is important that each individual supplies the equipment for which he or she is responsible and not bring any equipment that is the responsibility of others, unless so directed.

Section H: Alarms

- H.1. Overview** The interior communications 1MC is integrated with a system of alarm signals. The signals override the microphone control stations and are intended to notify the ship's crew of imminent danger. In order of priority, these alarms are: collision, chemical, general, and flight crash.
-
- H.2. Collision Alarm** This alarm signal is sounded by the OOD/conning station when there is a possibility that the ship will be struck by another waterborne unit. After bracing for shock and relaxing brace, all hands set material condition ZEBRA and be prepared to control fires and flooding.
-
- H.3. Chemical, Biological, Radiological, and Nuclear Attack** This alarm signal is sounded by the OOD/conning station or DCC and could be sounded automatically by the improved (chemical agent) point detection system (IPDS) or the IPDS life cycle replacement (IPDS-LR). The CBRN alarm is sounded for CBRN attacks. All hands exercise protective measures and procedures to reduce exposure and personnel injuries.
-
- H.4. General Alarm** This alarm signal is sounded or the word is passed by the OOD to notify the crew that the ship is going to battle stations/general emergency.
-
- H.5. Flight Crash Alarm** This alarm is sounded by the OOD or primary flight control (PRIFLY) to notify ship's company of a pending flight deck emergency.
-
- H.6. Toxic Gas Alarm** This alarm is sounded by ringing the cutter's bell in lieu of the general alarm to alert the crew of toxic gas hazard.
-
- H.7. Testing** Alarms are normally tested daily over the 1MC, preceded by the announcement: "The following is a test of the general, chemical, and collision alarms." Announce that the test is complete with the following: "Test complete; regard all further alarms."

NOTE:

It is important that each individual supplies the equipment for which he or she is responsible and not bring any equipment that is the responsibility of others, unless so directed.

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Chapter 3: Investigating Damage

Introduction

This chapter discusses sending an investigation team from the repair party to areas of the ship that have been damaged to determine the extent of the damage per reference (a), Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 2: Damage Control Practical Damage Control, S9086-CN-STM-020 (series).

In This Chapter

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B	Rapid Response Concept	3-5
C	DC Communications	3-6
D	Repair Locker Areas of Responsibility	3-8

Section A: Investigation Procedures

A.1. Overview

The investigators' primary responsibility is to rapidly locate damage to the cutter and report back to the repair locker. Secondly, the investigators take limited initial action to minimize damage, but not become bogged down in combating damage. Rapid and continuous assessment of the damaged and surrounding area provides important information for the DC Organization.

To prevent further damage in the course of investigation, personnel:

- Maintain positive control of watertight fittings during access, egress, and inspection.
- Secure compartments after inspection.
- Look for hidden damage.

A.2. Inspect Each Compartment

Inspect each compartment for:

- Fire and/or smoke.
- Flooding.
- Structural damage.
- Electrical cableway damage.
- Mechanical/equipment/vent duct damage.
- Personnel casualties.

Personnel in manned spaces investigate on-station and report results to the appropriate supervisory watch station, which in turn reports to DC Central. Investigators concentrate on unmanned spaces. Do not confine ship damage inspections to the primary damage area. Inspect outward from the damaged area and along the projectile path, if applicable. Inspect from the topside boundary fittings, if possible.

WARNING:

Per reference (a), Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 2: Damage Control Practical Damage Control, S9086-CN-STM-020 (series), do not open any watertight door, hatch, airfitting, oil fitting, cap, plug, scuttle, or manhole until it is definitely known that the compartment on the other side is either completely dry or flooded to such a small extent that opening the closure will not permit flooding to spread.

**A.3. Determine if
Compartment is
Flooded**

To determine if the compartment is flooded:

- Check for condensation on adjacent bulkheads.
- Tap diagonally on the bulkhead with a dogging wrench or similar object, listening for a distinct change in the echo tone.

**A.4. Underwater
Hull Damage**

When underwater hull damage is found or suspected:

- Sound and compare all tanks and voids with the pre-damage soundings.
- Sound the tanks and voids closest to the suspected damage first; keeping in mind that underwater structural damage is not necessarily confined to the adjacent area of the damage.

WARNING:

A dangerous but often necessary method of testing a compartment for flooding is to slowly slack off some of the dogs on the hinged side which hold a hatch or door closed. There is a slight amount of clearance around the hinge pins and, as the dogs are loosened, any water present will seep around the gasket and the knife edge on the side. Control is still maintained by the hinges and the opposite dogs. To check quick-acting doors and scuttles, slightly loosen the door handle or wheel while maintaining pressure on the dogs.

**A.5. Tell-Tale
Indications of
Damage**

- Smoke or toxic gases.
 - Loss of electrical power or lighting.
 - Loss of interior communications.
 - Sudden pressure gauge change.
 - Split seams, bulging bulkhead, or warped decks.
 - Unexplained change in list or trim.
 - Unusual noise or vibration.
 - Unexplained changes in tank soundings or contents.
 - Unusually warm vent ducting.
 - Hot machinery bearing.
 - Hot electrical cable or circuits.
-

A.6. Use of a Fire Finder

Use a fire finder to:

- Locate hot spots on bulkheads, decks, overheads, and within ventilation ducting.
- Locate overheating electrical cables, controllers, or components as an indicator of a short or component failure.

Report the discovery of a casualty or damage to the repair party leader/fire marshal immediately by the quickest means available. One member reports the damage while the other takes immediate action to control the casualty until the repair party arrives. If only one investigator is working, make the damage report first and then take damage control actions.

Once the investigation is complete, the investigators continue rounds until stood down from general quarters/general emergency (GQ/GE).



Section B: Rapid Response Concept

B.1. Overview Immediate response is essential; therefore, do not delay response to a casualty in order to don protective clothing or SCBAs. However, if immediately available, using SCBAs allows a continued aggressive attack on the fire in the presence of smoke while the attack team is en route to the scene via the appropriate repair locker. If the rapid responders are unable to control the casualty or the space becomes untenable, the rapid responders should isolate, set ZEBRA in the affected area, break out damage control equipment, and remain on scene until the assistance arrives. If the casualty is in a manned space, the watch team on station is responsible for the initial actions, and the rapid responders stand by to assist.

B.2. Rapid Response Team The USCG uses a rapid response team (RRT) when initially responding to a casualty. Rapid response teams are outlined in the cutter's watch, quarter, and station bill. The general practice is as follows:

- Inport--RRT member are the EOW and the engineering watchstander(s).
- Underway--RRT are DCTT members not on watch and the fire marshal.

B.3. Duties

- Immediately deploy the rapid response concept when a casualty is reported. When called away, members of the RRT report immediately to the scene. The remainder dress out at the designated repair locker.
- Mitigate and control casualty effectively without disrupting other ship operations.
- RRT may be a minimal response organization. If unable to immediately control the casualty, the ship will need to set GE.
- Is the first response to a damage control casualty in port during normal working hours.

Section C: DC Communications

C.1. Overview DC communications throughout the Coast Guard vary among specific cutters. Minimum communications consist of multi-channel handheld portable radios installed in each repair locker and/or sound-powered telephones per reference (f), Surface Ship Survivability, CGTTP/NTTP 3-20.31 (series). Store the radios in a charger with spare batteries. Designate these radios for damage control use only, not every day shipboard evolutions. DC Central monitors all required channels the repair party uses during casualties. Assign radio frequencies in advance to avoid confusion during casualties. Ensure message blanks are readily available for use in the event that other forms of communication fail.

C.2. Emission Control (EMCON) Plan All radios emit detectable radio frequency (RF) signals, so consider radio use in the ship's EMCON plan.

Recommended procedures for radio communications checks are:

- If GE is called away due to a shipboard emergency, communication checks are an automatic repair locker action.
- When GQ is set in preparation for battle, DC Central initiates communication checks when authorized by the bridge to break EMCON.
- Hazardous electromagnetic radiation to ordnance (HERO). In general, do not use radios in a weapons handling incident/accident. Specifically, do not use portable radios closer than 10 feet to HERO susceptible or unsafe ordnance, especially in the presence of any damaged, broken, or otherwise exposed explosive ordnance.

C.3. Radios/ Sound-Powered Telephones

- Use standard procedures and phraseology per reference (a), Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 2: Damage Control Practical Damage Control, S9086-CN-STM-020 (series).
- When GQ is sounded, distribute radios (if available) to the scene leader and investigators. Written messages from the repair locker leader, the scene leader, or investigators are not required as long as radio communications are maintained. Scene leaders and investigators are still required to have message blanks with them for contingency purposes.
- If available, incorporate radio use into ship procedures for the at-sea fire party and response to a fire inport.

- Use message blanks or a telephone talker's log book to document reports received in the repair locker. This is used for both plotting and maintaining a record of communications.
 - Use radios as frequently as possible, not only to train key personnel in use of radio procedures, but also to learn any system limitations.
-

C.4. Background Noise

Loud background noises near the radio microphone can cause voice transmissions to be inaudible. The noise created by the fire itself or the rush of firefighting water being discharged from a hose nozzle creates background noise, which impairs clear voice transmission when in close proximity to a nozzleman. Therefore, an attack team leader needs to be aware of the potential for background noise and be prepared to reposition him or her to "clear" the interference.

C.5. Hot Operations

Use the following "hot operations" procedures when ambient temperature at a base station is expected to be 90° Fahrenheit or higher:

- Remove charged batteries from the charger until the ambient temperature has cooled down.
 - When charging is required, use a charger or conditioner where the ambient temperature is below 90° Fahrenheit.
 - If the hot period is expected to last more than 3 days, store the batteries and/or radios in a cooler area. Return the equipment to its normal storage area when temperatures allow.
-

Section D: Repair Locker Areas of Responsibility

D.1. Overview	Customize the following information for your specific cutter.														
D.2. Repair 2	Repair 2 area of responsibility is from <frame XX to frame XX> above and below.														
D.3. Repair 2 Important Features (example)	<table><tr><td>Bow Thruster Machinery Room (3-10-0-Q)</td><td>Hydraulic oil.</td></tr><tr><td>Lift Station (3-20-0-Q)</td><td>H2S, methane, raw sewage.</td></tr><tr><td>Air Conditioning Equipment Room (3-22-0-Q)</td><td>Refrigerant.</td></tr><tr><td>Vac Collection Holding & Transfer Room (3-28-2-E)</td><td>H2S, methane, raw sewage.</td></tr><tr><td>Boatswain Shop & Strm (2-10-0-A)</td><td>Hydraulic oil.</td></tr><tr><td>57 mm Magazine (2-16-0-M)</td><td>Ammunition.</td></tr><tr><td>Rescue Station (2-48-1-Q)</td><td>Hydraulic oil.</td></tr></table>	Bow Thruster Machinery Room (3-10-0-Q)	Hydraulic oil.	Lift Station (3-20-0-Q)	H2S, methane, raw sewage.	Air Conditioning Equipment Room (3-22-0-Q)	Refrigerant.	Vac Collection Holding & Transfer Room (3-28-2-E)	H2S, methane, raw sewage.	Boatswain Shop & Strm (2-10-0-A)	Hydraulic oil.	57 mm Magazine (2-16-0-M)	Ammunition.	Rescue Station (2-48-1-Q)	Hydraulic oil.
Bow Thruster Machinery Room (3-10-0-Q)	Hydraulic oil.														
Lift Station (3-20-0-Q)	H2S, methane, raw sewage.														
Air Conditioning Equipment Room (3-22-0-Q)	Refrigerant.														
Vac Collection Holding & Transfer Room (3-28-2-E)	H2S, methane, raw sewage.														
Boatswain Shop & Strm (2-10-0-A)	Hydraulic oil.														
57 mm Magazine (2-16-0-M)	Ammunition.														
Rescue Station (2-48-1-Q)	Hydraulic oil.														
D.4. Repair 3	Repair 3 area of responsibility is from <frame XX to frame XX> above and below.														
D.5. Repair 3 Important Features	A list of important features is located in reference (f), Surface Ship Survivability, CGTTP/NTTP 3-20.31 (series).														

NOTE:

Annotate spaces that are normally locked and unmanned (e.g., store rooms, offices, staterooms, etc.) during GQ/GE to aid the repair locker leader and investigators. Divisions responsible for locked spaces must post a sign at the entry point stating who maintains keys to the space.

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Chapter 4: Compartment Isolation

Introduction This chapter discusses isolating a damaged compartment from all cutter systems.

In This Chapter This chapter contains the following section:

Section	Title	Page
A	Isolation Lists	4-2

Section A: Isolation Lists

A.1. Overview Prepare compartment isolation lists for each significant compartment in the repair locker's respective areas of responsibility, with copies maintained in DC Central/bridge. Each isolation list identifies:

- Electrical-440V/110V electrical loads. Reference (c), Naval Ships' Technical Manual (NSTM), Chapter 555, Volume 1: Surface Ship Firefighting, S9086-S3-STM-010 (series), provides rules for electrical isolation in the event of fire. Reference (c) also discusses electrical isolation during a machinery space fire. Procedures in this chapter are done per these references.
- Mechanical.
- All fuel/lube/hydraulic oil systems.
- Compressed air systems.
- Chill water systems.
- Fire main isolation valves.
- Ventilation.
- Ventilation controllers: Supply, exhaust, and recirculation.
- Natural ventilation closures, Circle William fittings.
- DC equipment. Firefighting equipment as required.
- Hazardous materials: Hazardous materials stored in each compartment.
- Watertight, airtight, and oil tight closures: DC closures in each compartment.

List individual items logically while considering its relative importance.

NOTE:

Repair locker/damage control training team (DCTT) personnel frequently verify/update compartment isolation lists during DC drills and following significant maintenance periods. Each qualified EOW and individual repair party electrician not qualified as an EOW physically review the lists.

A.2. Isolation list Example An example of an isolation list is shown on the following page.

TAB A - ISOLATION LIST (example)

<i>COMPARTMENT NAME:</i> _____		
<i>COMPARTMENT NUMBER:</i> _____		
<u>EQUIPMENT/ SYSTEM</u> LOAD CENTER 110V OUTLETS	<u>ELECTRICAL ISOLATION</u> <u>CIRCUIT ID #</u> 1S-3P-11 (3-45-2)-1P-C-P	<u>BREAKER LOCATION</u> 1-2-3-E
<u>PIPING</u> MAIN DRAIN F/O/SUPPLY LP AIR	<u>MECHANICAL ISOLATION</u> <u>VALVE SYSTEM #</u> 5-107-2 FO-1 LPA-1	<u>VALVE LOCATION</u> 5-170-0-E 1-2-0-1 1-2-0-L
<u>VENTILATION</u> SUPPLY EXHAUST NATURAL	<u>VENTILATION</u> <u>NUMBER</u> 1-2-1	<u>CONTROLLER LOCATION</u> 1-2-0-L
<u>EQUIPMENT NAME</u> FIXED HALON 5LB CO2 BTL RAM FAN	<u>DAMAGE CONTROL EQUIPMENT</u> <u>FRAME</u> FR 10 FR 3 FR 1	<u>REMOTE OPERATOR</u> 2-30-2-1 HALON STRM
<u>STORAGE AREA</u> HAZMAT LOCKER	<u>HAZARDOUS MATERIALS</u> <u>FRAME #</u> FR 5	<u>CONTENTS</u> OILS (VARIOUS)
<u>CLOSURE TYPE</u> QAWTD WTD ATC	<u>CLASSIFICATION NUMBER</u> ZEBRA 1-12-0 YOKE 1-9-1 X-RAY 1-8-1	<u>ACCESS TO</u> 1-12-2-L 1-4-1-Q 1-4-1-Q

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Chapter 5: Firefighting

Introduction

This chapter discusses general firefighting organization and practices, aircraft firefighting, and machinery space firefighting doctrine (MSFD) for class Bravo fires.

In This Chapter

This chapter contains the following sections:

Section	Title	Page
A	General Shipboard Firefighting	5-2
B	Aircraft Firefighting	5-4
C	Machinery Space Firefighting Doctrine (MSFD) for Class Bravo Fires	5-5
D	Firefighting Methods	5-6
E	Compartment Hazards/Areas (Examples)	5-8
F	Magazine Sprinkler Control Valves	5-9
G	Smoke Control	5-10

Section A: General Shipboard Firefighting

A.1. Overview

Every crewmember must be concerned with fire prevention and aware of firefighting details in the following references:

- (a) Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 2: Damage Control Practical Damage Control, S9086-CN-STM-020 (series).
- (b) Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 3: Damage Control Engineering Casualty Control, S9086-CN-STM-030 (series).
- (c) Naval Ships' Technical Manual (NSTM), Chapter 555, Volume 1: Surface Ship Firefighting, S9086-S3-STM-010 (series)
- (f) Surface Ship Survivability, CGTTP/NTTP 3-20.31 (series).
- (g) Naval Ships' Technical Manual (NSTM), Chapter 074, Volume 3: Gas Free Engineering, S9086-CH-STM-030 (series).

The major steps involved in shipboard firefighting are locating the fire, reporting, containing, extinguishing, and restoring from the casualty.

Considerations for locating the fire include knowledge of the ventilation systems and employment of the thermal imager. The thermal imager is a great tool for locating the fire source. Thermal imagers cannot see through walls, glass, or other solid objects, but they can detect heat that has transferred to the surface of an object. The user can observe as little as a 0.05° Celsius difference in surface temperature.

The discovery of smoke normally precedes the discovery of a fire; therefore, personnel should be familiar with the ventilation systems and air flow through their spaces to allow for quicker response.

A.2. Reporting

Personnel must be trained to report fire/smoke in the following manner: access the ship's emergency number, identify yourself, report class of fire or color of smoke, report location (space nomenclature preferred), and specify compartment number, if known. If the space is tenable, proceed to the fire and take initial firefighting actions. If it is untenable, isolate the space and then return to your assigned GE billet. Make sure all personnel in the surrounding area are aware of the fire/smoke.

A.3. Containing If a fire is not controlled by the rapid response team (RRT) or personnel on duty in the affected space, dress the hose team out in full firefighter's ensemble. Once the fire is controlled, the scene leader can adjust personnel protection equipment, as necessary. For example, as the spaces are cooled, endurance of relief personnel can be improved by wearing only engineering coveralls rather than the firefighter protective gear (FPG) coveralls.

Recent lessons learned from shipboard fires have shown how spaces are more vulnerable to vertical fire spread; the topside fire boundary cannot be over emphasized. Fire boundary personnel must be very active in removing all combustibles from adjacent spaces. If the space has false decks, remove or wet them down. One inch of water on deck can prevent fire spread even when the temperature in the space below is above 1000° Fahrenheit.

A.4. Extinguishing Put the fire out using preferred agents listed in [Section D: Firefighting Methods](#).

A.5. Restoring The extent of damage usually determines the speed of casualty restoration. Standard operating procedures (SOPs) should be used where applicable.

Section B: Aircraft Firefighting

B.1. Overview Chapter 14 of reference (h), Shipboard-Helicopter Operational Procedures Manual, COMDTINST M3710.2 (series), describes firefighting procedures following a helicopter crash on a cutter. These procedures can be adjusted to meet the needs and operating requirements of each cutter.

Section C: Machinery Space Firefighting Doctrine (MSFD) for Class Bravo Fires

C.1. Overview

- Consult reference (d), Machinery Space Firefighting Doctrine for Class Bravo Fires, COMDTINST M9555.1 (series), to ensure all isolation lists are completed in the prescribed order. Make sure power sources for all firefighting systems are clearly identified in the electrical isolation list.
- Prepare laminated copies of those pages of MSFD which require action by propulsion plant watchstanders and insert into the Engineering Casualty Control Manual.
- Prepare laminated copies of those pages of the MSFD that require action by the repair/fire party personnel and keep in the DC repair lockers.
- Each team member requires copies of only those sections applicable to his or her duties.
- Note the appropriate aqueous film forming foam (AFFF) activation times in the MSFD. Minimum activation time for AFFF is 1 minute.

NOTE:

Break out the entire MSFD so all contents are available for review.

Section D: Firefighting Methods

D.1. Berthing Area Combustibles	<u>Common Combustibles and Locations</u>	Fire	<u>Extinguishing Agents</u>
	Woodwork, bedding.	A	1. Fire main.
	Clothing, combustible stores.		2. AFFF.
D.2. Explosives	Explosives, propellants.	A/D	1. Magazine sprinkling. 2. Fire main. 3. AFFF.
D.3. Flammable Liquids/Fuels	Paints, spirits.	B	1. Fire protection system.
	Flammable liquid stores.		2. AFFF.
	Fuel oil, JP-5.		3. Fire main. 4. Potassium bicarbonate powder (PKP). 5. CO2.
D.4. Galley Flammables	Deep fat fryer.	B	1. Aqueous potassium carbonate (APC) range guard.
D.5. Electronic Equipment	Electrical/Electronic.	C	1. De-energize circuit. 2. CO2. 3. Fire main. 4. AFFF. 5. PKP.

WARNING:

Whenever possible, de-energize electrical circuits before starting firefighting efforts to minimize risk of personnel shock/electrocution.

CAUTION:

Use PKP only as a last resort due to its corrosive nature.

**D.6. Flammable
Metals**

Magnesium Alloy.

D

1. Jettison overboard.
2. Fire main (not solid stream).

Section E: Compartment Hazards/Areas (Examples)

E.1. Repair 2 (Example)	Space	Hazard	Remarks
	Bow Thruster Machinery Room (3-10-0-Q)	Hydraulic oil.	PRI - FPL 2-14-1 w/inline eductor/AFFF. SEC - FPL 2-13-1 w/inline eductor/AFFF.
	Lift Station (3-20-0-Q)	H2S, methane, raw sewage.	Toxic/flammable.
	Air Conditioning Equipment Room (3-22-0-Q)	Refrigerant.	Toxic/personnel hazard.
	Vac Collection Holding & Transfer Room (3-28-2-E)	H2S, methane, raw sewage.	Toxic/flammable.
	Boatswain Shop & Strm (2-10-0-A)	Hydraulic oil.	PRI - FPL 2-18-1 w/inline eductor/AFFF. SEC - FPL 2-20-1 w/inline eductor/AFFF.
	57 mm Magazine (2-16-0-M)	Ammunition.	PRI - Magazine sprinklers. SEC - FPL 2-22-1.
	Rescue Station (2-48-1-Q)	Hydraulic oil.	PRI - FPL 2-53-1 w/eductor/AFFF.

Section F: Magazine Sprinkler Control Valves

F.1. Magazine Sprinkler Control Valves (Example)	<u>Repair</u>	<u>Remote Valve</u>	<u>Local Actuation/Location</u>	<u>Compt. Served</u>
	2	2-21-1	2-53-1/ECR (2-52-1-E)	2-16-M (ex.) magazine.
	2	1-18-2	Floods with the 57mm mag.	1-16-2-M small arms magazine.
	3	02-59-2	2-53-2/ECR (2-52-1-E)	02-59-2-M (CIWS magazine).

NOTE:

Unless otherwise specified, activate magazine sprinkler systems only with the CO's permission.



Section G: Smoke Control

G.1. Overview

Smoke and heat from a severe fire can cause mission interruption, damage vital electronic equipment, create a large demand for breathing apparatus, delay firefighters in locating the fire, and present a life threatening environment. Smoke boundaries are set to contain smoke. When exhausting smoke to the weather by active desmoking, smoke boundaries are also used to establish a controlled path for exhausting smoke to the weather. The smoke boundary nearest the fire is designated as the inner smoke boundary and normally coincides with the primary fire boundary. Also set a second smoke boundary, called the outer smoke boundary and located farther away from the fire. The area between the inner and outer smoke boundaries is called the smoke control zone. Thus, when the attack team opens access to the fire space, smoke is trapped in the smoke control zone.

G.2. Rules for Smoke Boundaries

- Keep the access to the fire space within the smoke control zone.
- Keep fire plugs and hose reels used by the fire party within the smoke control zone to a minimum.
- If desmoking, establish and maintain an active desmoking flow path (supply and exhaust) from the smoke control zone to weather. Set the inner smoke boundary by closing doors and hatches to the fire space.
- Use smoke curtains and blankets to maintain smoke boundaries when firefighting personnel open doors and hatches.
- Use smoke curtains and blankets to set smoke boundaries when doors and hatches are damaged and are no longer tight.

G.3. Machinery Space Smoke Control

Supplement your machinery space fire doctrine with a list of fans and their controls to be secured for a designated fire and smoke control zone. List weather deck supply intake and exhaust discharge locations. List the location of controllers, their designation, and area served.

G.4. SCBAs

Use SCBAs with voice amplifiers, if available, for all personnel while working within a smoke control zone as well as the affected spaces until the atmosphere is determined to be safe.

Chapter 6: Toxic Gas Bill

Introduction

This chapter discusses actions to take in the event of an unexpected toxic gas release that causes a personnel injury, equipment damage, or exceeds the permissible exposure limit (PEL). This chapter also overviews sources and types of toxic gases.

In This Chapter

This chapter contains the following sections:

Section	Title	Page
A	Responsibilities	6-2
B	Sources and Types of Toxic Gases	6-5

Section A: Responsibilities

A.1. Overview

A number of toxic substances such as refrigerant, carbon dioxide, and solvents are carried aboard each cutter. Fires, oxidation, and the anaerobic decomposition of organic material can create additional toxic gas hazards. The severity of a toxic gas incident is determined by comparing the measured concentration of the toxic gas against established exposure limits.

This bill addresses those actions that must be taken in the event of an unexpected toxic gas release that causes personnel injury, equipment damage, or exceeds the PEL set in reference (g), Naval Ships' Technical Manual (NSTM), Chapter 074, Volume 3: Gas Free Engineering, S9086-CH-STM-030 (series). This bill deals with emergency situations. The following references provide procedures and precautions to take for non-emergency releases of toxic gasses, including working with paints and solvents and entry into confined spaces for maintenance:

- Reference (c), Naval Ships' Technical Manual (NSTM), Chapter 555, Volume 1: Surface Ship Firefighting, S9086-S3-STM-010 (series).
- Reference (f), Surface Ship Survivability, CGTTP/NTTP 3-20.31 (series).
- Reference (g), Naval Ships' Technical Manual (NSTM), Chapter 074, Volume 3: Gas Free Engineering, S9086-CH-STM-030 (series).

WARNING:

This bill is only for toxic gas release. Confined space entry and cold work have preplanned procedures.

A.2. All Hands

- Personnel evacuate the affected compartment immediately. Only necessary personnel reenter the compartment with the appropriate breathing devices as directed in this bill.
 - Pass the word to the OOD, giving the type of gas and source (if known), compartment name and number, and any casualties.
 - Isolate the compartment(s) only enroute to muster area or fresh air by closing all airtight and watertight fittings and securing the installed ventilation in and around the affected area unless it is designed for toxic gas removal.
 - Alert personnel in surrounding spaces.
-

A.3. OOD

- Order the response to the casualty by calling away the inport or underway RRT. Take or direct action per [Appendix B: Inport Checklists for Toxic Gas Bill](#) or [Appendix C: Underway Checklist for Toxic Gas Bill](#).

NOTE:

Rapidly ring the cutter's bell in lieu of the general alarm to alert the crew to a toxic gas hazard.

- Pipe via the 1MC (no less than twice) and include the compartment(s) involved, areas to avoid, and the type of gas (if known).
- Take an accurate muster.
- If inport:
 - Notify SOPA and surrounding commands.
 - Call 911 for medical support.
 - Secure the brow and pier.

A.4. DCA/EPO

- The DCA/gas free engineer under the direction of the EO is responsible maintaining and administering this bill.
 - Establish and coordinate training of all hands in the hazards of toxic gasses and the response to a toxic gas incident per this bill.
 - Man-up DC Central/pilothouse as the primary controlling station during an emergency toxic gas situation.
 - Establish and coordinate training of gas free engineering personnel (GFEP) in the use of all types of oxygen, explosive, and toxic gas instruments.
 - Coordinate ventilation efforts with the RRT and manned locker.
 - Provide recommendations to the OOD concerning wind direction.
 - Review the National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards:
 - <http://www.cdc.gov/niosh/npg/>
-

A.5. RRT

- Don SCBAs; set primary and secondary toxic gas boundaries for the affected areas.
- Rescue any people overcome by the gas in the affected space.
- Post a watch outside each entrance to the affected space.
- Establish communications with the quarterdeck (inport) or DC Central/bridge (underway).
- Carry out orders from the OOD or DC Central.

NOTE: **Emergency escape breathing devices (EEBDs) are not authorized to be worn by rescue personnel; however, an EEBD can be given to a conscious toxic gas victim.**

WARNING: *Wear additional personal protective equipment (PPE), such as solvent resistant gloves and spill suits, according to the guidelines contained in the NIOSH pocket guide. If the toxicant is unknown, the OSL directs such PPE be worn as he or she deems necessary based on all available information.*

**A.6. Repair
Locker
Personnel**

- Man the locker farthest from the affected space. Those individuals who are assigned to the unmanned locker report to the flight deck/weather deck.
 - Establish communications with the quarterdeck (inport) or DC Central (underway).
 - Direct the primary hose team to don SCBAs to assist or relieve the RRT if necessary.
 - Prepare a trunked fan for operation as directed by the DCA/EPO.
-

Section B: Sources and Types of Toxic Gases

**B.1. Location of
 Toxic Gas
 Hazards**

WHEC 378 Example/Make Specific to Your Cutter

Toxic Gas Hazards						
Space	Compt.	Hazards	Supply	Exhaust	Size of Space (ft ³)	Min for 2 air changes by Ram Fan
Paint Stowage Room	2-Q-0-K	Solvents	2-26-1	2-26-1	3000	3
			Wind Rm	Wind Rm		
Flammable Stores	3-22-0-K	Numerous	2-26-1	2-48-2-Q	3000	3
			Wind Rm	Bosn Wks		
Pump Room #1 (#1 Fire Pump Rm)	5-96-0-E	Benzene, Hydrogen Sulfide	2-32-1-Q	1-68-2-A	1500	2
			Fan Room	Deck Gr Lckr		
Sewage Treatment Room #1 (Fwd Sewage)	5-144-0-Q	Hydrogen Sulfide, Methane, Benzene	01-97-1-Q	01-97-2-Q	3450	3
			Fan Room	Fan Room		
Aux Machinery Room #1 (AC Flat)	3-179-1-Q	R-12	3-177-1	3-186-2	10000	10
			EM Shop	Aux Shop		
Pump Room #2 (DOPR)	5-192-0-E	Benzene, Hydrogen Sulfide	01-207-2	1-232-2	1500	2
			EM Shop	Main Ctrl		
Aux Machinery Room #3 (JP-5 Pump Room)	3-272-0-E	R-12, Benzene	2-304-1-Q	1-293-2, 1-289-2	4000	4
			Fan Room	Incinerator Rm		
Passage (Reefer Flat)	3-280-0-L	R-12, Hydrogen Sulfide	2-304-1-Q	1-289-2	4224	4
			Fan Room	Incinerator Rm		

Toxic Gas Hazards						
Space	Compt.	Hazards	Supply	Exhaust	Size of Space (ft ³)	Min for 2 air changes by Ram Fan
Sewage Treatment Room #2 (Aft Sewage)	3-280-4-Q	Hydrogen Sulfide, Methane	2-304-1-Q	1-289-2	4224	4
			Fan Room	Incinerator Rm		
Chill Box	3-280-1-A	R-12	N/A	N/A	1200	1
Reefer Box	3-293-1-A	R-12	2-304-1-Q	N/A	1200	1
Aft Steering	2-320-0-E	Arsine, Benzene	Fan Room	1-301-2	12180	12
DC Shop	2-304-2-Q	Acetylene	2-304-1-Q	Incinerator Rm	3200	3
			Fan Room			
DC Storeroom	3-336-0-A	Hydrogen Sulfide	2-304-1-Q	1-301-2	2160	2
			Fan Room	Incinerator Rm		

NOTE:

Follow this bill for any unintended release of Halon 1301/CO2/ FM 200 from any of the cutter's systems. Only enter the space while wearing an SCBA. Cutters with R-22 and R-134, include the required information in the matrix.

Consult [Appendix A: Glossary & Acronyms](#) for a description of these fire suppression agents and refrigerants.

B.2. List of Toxic Gases/Vapors

Common Toxic Gases				
Gas/Vapor	How Usually Produced	How Probably Detected	Effects of Exposure	Max Allowable Concentration
Acetone	Used as a solvent	Smell	Fire hazard, slight eye/nose irritant @ high concentration	PEL: 750 PPM
Acetylene	Welding bottle leak	Smell of garlic	Suffocation @ high concentration	IDLH: 8 PPM
				PEL: 1 PPM
Acrolein	Cooking, engine exhaust, cigarettes	Smell	Disagreeable choking odor, irritant to eyes and throat	PEL: 0.1 PPM
Ammonia	Amine decomposition	Ammonia odor	Irritant to eyes and throat	IDLH: 300 PPM
				PEL: 50 PPM
Arsine	Battery gassing	Garlic or rotten egg smell	Nausea or vomiting	IDLH: 3 PPM
				PEL: 0.05 PPM
Benzene	JP-5	Fuel smell/ Dräger tube	Carcinogen	IDLH: 500 PPM
				PEL: 1 PPM
Carbon dioxide	Human exhale, fire ext., combustion	Dräger tube	Headache, dizzy, blunt asphyxiant at high conc.	PEL: 5000 PPM
Carbon monoxide	Cigarettes, product of combustion	Smoke smell, Dräger tube	Headache, sleepy, subtle asphyxiant	IDLH: 1200 PPM
				PEL: 35 PPM

Common Toxic Gases				
Gas/Vapor	How Usually Produced	How Probably Detected	Effects of Exposure	Max Allowable Concentration
Chlorine	Salt in battery	Bleach odor	Burning eyes/ throat	IDLH: 10 PPM
				PEL: 0.5 PPM
Hydrocarbons	Cooking, paints, solvents, fuels	Smell	Dizzy, irritant to eyes and throat	IDLH: 30 PPM
Hydrochloric acid fumes	Oxidation of R-12 (refrigerant)	Acrid odor	Burning of eyes and throat	C: 5 PPM
Hydrogen sulfide	Sewage	Rotten egg smell	Eye irritant, asphyxiant	IDLH: 100 PPM
				PEL: 10 PPM
Nitric oxide	Magazines/armory	Ether/alcohol smell	Dizzy, sleepy, asphyxiant	IDLH: 25 PPM
				PEL: 25 PPM
Mercury	Leaking mercury	Mercury vapor detector	Long term effects (Cancer, insanity)	IDLH: 10 PPM
				PEL: 0.05 mg/m ³
Ozone	High voltage equip.	Smell	Headache, respiratory irritant	IDLH: 5 PPM
				PEL: 0.1 PPM

Common Toxic Gases				
Gas/Vapor	How Usually Produced	How Probably Detected	Effects of Exposure	Max Allowable Concentration
Phosgene	Oxidation of R-12 (refrigerant)	Odor of fresh-cut grass	Burning of eyes and throat	IDLH: 2 PPM
				PEL: 0.1 PPM
Stibine	Battery gassing	Garlic or rotten egg smell	Nausea or vomiting	IDLH: 5 PPM
				PEL: 0.1 PPM
Sulfuric acid	Battery gassing	Acrid	Burning of eyes and throat	IDLH: 15 mg/m ³
				PEL: 1 mg/m ³

- PEL: “Permissible exposure limit” refers to the time weighted average concentrations for a particular chemical or toxic gas that must not be exceeded during any 8-hour work shift of a 40-hour work week.
- C: “Ceiling” refers to the maximum concentration for a particular chemical or toxic gas which must not be exceeded during any part of the work day.
- IDLH: “Immediately dangerous to life and health” refers to the maximum concentration of a particular chemical or toxic gas which, if exceeded for even a short period, is life threatening.

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Chapter 7: Ship Stability and Flooding Control

Introduction This chapter discusses ship stability during flooding conditions.

In This Chapter This chapter contains the following sections:

Section	Title	Page
A	Required and Available Stability	7-2
B	Procedures After Damage	7-3
C	Jettison Bill	7-5
D	Modified Zebra Bill	7-7

Section A: Required and Available Stability

A.1. Overview

Observe the following limitations to ensure the ship has its required stability and reserve buoyancy:

- The limiting drafts specified in reference (a), Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 2: Damage Control Practical Damage Control, S9086-CN-STM-020 (series), are not submerged before damage.
- There are no excessive or unusual topside weights or deck loads, such as icing.
- The liquid and dry cargo loading instructions contained in reference (a) and Damage Control Diagram 1 (Liquid Loading Diagram) are followed.
- A proper degree of watertight integrity is maintained (watertight fittings are effectively maintained and personnel are adequately trained to set the required material condition).

A.2. Daily Stability Calculations

The EO/EPO determines the ship's stability per cutter's Damage Control Book or the Stability and Loading Data booklet and completes 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.

Section B: Procedures After Damage

- B.1. Overview** Reference (a), Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 2: Damage Control Practical Damage Control, S9086-CN-STM-020 (series), provides detailed instructions and procedures to be followed in the event of damage. The following is a generic sequence of events.
-
- B.2. Step 1:
Contain Damage**
- Isolate flooding.
 - Set flooding boundaries.
 - Isolate electrical power.
 - Isolate mechanical systems.
-
- B.3. Step 2:
Determine
Impact of
Flooding and
Prioritize
Dewatering
Efforts**
- Dewater spaces colored pink on the flooding effects diagram, which can be made sufficiently tight to allow pumps to be effective.
 - Dewater spaces which have the greatest free surface effect first.
 - Use locally prepared stability data cards, if applicable, to assess impact of flooding.
 - Use Flooding Casualty Control Software (FCCS) to assess the impacts of stability.
-
- B.4. Step 3:
Evaluate Critical
Stability**
- Stability is critical when immediate improvement is necessary to avoid loss of the ship. Consider stability critical if any or all of the following conditions exist:
- Small or negative metacentric height (GM).
 - The ship is sluggish, with a slow erratic roll period and a tendency to hang at the end of the roll.
 - The ship has a tendency to list at the same angle to either side.
 - The ship has a list, which cannot be accounted for by off-center weight.
 - Approaching or exceeding floodable length:
 - The extent of flooding approaches or exceeds the maximum amount of flooding tabulated in reference (a).
 - Excessive list:
 - The ship lists to a static heel of 15° or more.

- Heavy winds and seas:
 - Heavy winds and rough seas are prevailing or are anticipated.
-

**B.5. Step 4:
If Stability is
Critical**

- Suppress free surface effect by dewatering or partially filling flooded compartments (only if marked “yellow” on DC diagrams.)
 - Strike down solid weights, such as ammunition, from upper deck handling rooms to magazines.
 - Ballast tanks according to the ship’s liquid loading instruction.
 - If freeboard is adequate, completely fill those compartments that improve stability when flooded solid (“yellow” or “green” compartments on the flooding effects diagram).
 - Favor stability in the handling and maneuvering of the ship. Limit speed and rudder angle to reduce dynamic forces.
 - Jettison topside weights if the first two measures in the list above are insufficient or impossible (these are difficult and time consuming procedures). Concentrate on heavy items and plan ahead, considering the effect of removing various items.
-

**B.6. Step 5:
Eliminate or
Reduce List**

List caused by off-center flooding only:

- Counter-balance on the high side to reduce 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.

List caused by negative GM only:

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

List caused by a combination of off-center loading and negative GM:

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

Section C: Jettison Bill

C.1. Overview

The jettison bill establishes procedures for jettisoning material to improve stability impaired by damage or grounding.

The DCA under the direction of the EO is responsible for this bill.

Maintain a list of materials and equipment in order of priority with their location, weight, and height above the waterline that might require jettisoning.

Conditions which might warrant the need to jettison material from the ship are:

- When stability is degraded.
- To lighten ship when grounded.
- When damage has reduced stability.
- When list or trim impairs the efficiency of the cutter's gun platform (wartime).
- When it is imperative that the range of stability be increased to prevent capsizing.
- When the ship is stranded and must be lightened for salvage.
- After a chemical, biological, and radiological (CBR) attack, jettison all material that cannot be decontaminated. Advise the CO regarding all material jettisoned from the ship.
- After catastrophic damage, and with the CO's permission, clear all damaged material from the ship that is not useful.

Jettison is accomplished by all available personnel. Remove the highest, heavy mobile weight first followed by lower, heavy mobile weights in order of accessibility. Maintain weight handling equipment until no longer useful.

C.2. Small Boat Jettison

In the event small boats are required to be jettisoned, crew one small boat (at a minimum) per standard small boat operations. The crewed small boat rounds up and rafts together the non-crewed small boats, once launched. All small boats remain under the control of the crewed small boat and kept within close proximity to the cutter.

**C.3. Helicopter
Jettison**

Only launch the helicopter(s) if the helicopter is able to transition to an alternate safe landing zone and upon recommendation of the flight commander. If the helicopter is unable to be launched, jettison it from the flight deck over the side of the cutter.

CAUTION:

Carefully consider which side to jettison the helicopter. Remove the flight deck nets on that side to prevent the helicopter from becoming caught in the net and causing greater instability.

C.4. Life Rafts

Jettison the life rafts last. In the event the life rafts are jettisoned, deploy them per standard operating procedures. Once deployed, the small boat is responsible for gathering the inflated life rafts, and ensuring they are lashed to the small boats and kept under positive control.

C.5. Anchors

Jettison the port and starboard anchors. Break the chain at an appropriate fathom shot.

Section D: Modified Zebra Bill

D.1. Overview

There may arise certain situations during which the CO may wish to set a modified material condition ZEBRA. Setting of modified material condition ZEBRA will give a higher survivability stance than condition YOKE. At the same time, modified ZEBRA is less restrictive and will more readily allow the accomplishment of certain operational requirements. Modified ZEBRA may result as an upgrade from condition YOKE or as a downgrade from condition ZEBRA. Some of the situations that may make a modified material condition ZEBRA desirable are:

- Underway replenishment.
- Vertical replenishment.
- Air operations.
- Amphibious operations.
- Transit of known or suspected hazardous navigation areas.

Refer to the DC Closure Log for any modifications to the setting of Zebra.

NOTE: **Follow your cutter's specific bill.**

NOTE: **Do not enter structural Zebra into the closure log as it is not a material condition.**

NOTE: **The appropriate pipe is, "Now set modified zebra throughout the ship. Secure all structural fittings main deck and below."**

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Chapter 8: Chemical, Biological, Radiological, Nuclear High-Yield Explosive (CBRNE)

Introduction This chapter provides a link to the information responders need to counter nerve, blister, choking, and blood agents that might be used as weapons against friendly forces.

In This Chapter This chapter contains the following section:

Section	Title	Page
A	CG Portal Link to CG-DOD-2	8-2

Section A: CG Portal Link to CG-DOD-2

A.1. CBRNE Link

The following link displays the main CBRNE folder:

[https://cgportal2.uscg.mil/units/cgdod2/CBRNE/Shared%20Documents/Fo
rms/AllItems.aspx](https://cgportal2.uscg.mil/units/cgdod2/CBRNE/Shared%20Documents/Fo
rms/AllItems.aspx)

Chapter 9: Strip Ship/Clear Ship Bill

Introduction This chapter provides strip ship and clear ship procedures.

In This Chapter This chapter contains the following section:

Section	Title	Page
A	Strip Ship and Clear Ship Procedures	9-2

Section A: Strip Ship and Clear Ship Procedures

A.1. Overview This bill provides organization and procedures to effectively strip and clear ship in the event that CBR warfare or catastrophic damage is possible, or when preparing for wartime deployment. The DCA/EPO is responsible for this bill.

Strip items from the ship which are not necessary for the reasonable comfort of personnel at sea, sustaining the cutter, or needed in Condition I or Condition III. Strip items that are by nature fire hazards or that can be broken to cause splinters or missiles.

A.2. CO Responsibilities

- Order the EO and DCA/EPO to start strip ship and clear ship procedures.
- Be informed of all material jettisoned from the ship.

A.3. DCA/EPO Responsibilities

- Maintain a list of materials and equipment in order of priority with their location, weight, and height above the waterline that might require jettisoning.
- Make sure that each department complies with this bill.

A.4. Department Head Responsibilities

- Provide lists of material falling within the purview of this procedure to the DCA/EPO. After initial submission, ensure that the DCA/EPO is kept informed of any changes in the status of material on the lists.
- Per procedures in reference (a), Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 2: Damage Control Practical Damage Control, S9086-CN-STM-020 (series), remove all porous materials from the weather deck that absorb CBR agents. Remove all non-essential items that are fire hazards from the ship, such as:
 - Wooden articles: Excess portable tables and benches, gratings, chests, lockers, sawhorses, stepladders, bulletin boards, boxes and cartons, lumber not suitable for damage control shoring, and accommodation ladders.
 - Insulation except where vital (e.g., hot machinery).
 - Non-fireproof fabrics: These include bulk canvas, baled rags, hose covers, side curtains, below deck covers, decorating flags and dressing lines, curtains, rugs, carpets, coca and rubber matting, chair and transom covers, civilian clothes, trunks, suitcases and unnecessary personal effects, old and surplus charts, correspondence over 1 year old, canvas awnings, canvas ladder screens,

upholstered lounge chairs, paper and office supplies in excess of 3 month supply, excess bunting and flags, excess toilet paper, excess manila line and cordage, newspapers, magazines, and books. Treat all covers and life jackets retained aboard with a flame resistant compound.

- Flammable fluids and acids: These include alcohol, ordnance oils, cleaning and lighter fluids, paints, varnish, paint remover, furniture polish, boat lubricating oils, oils and grease in excess of 3 month supply, lacquer, paint thinner, turpentine, and linseed oil. Retain only the standard allowance (3 month supply) of alcohol and grease. Stow in a flammable storage locker and distribute in small quantities.
 - Other flammable supplies: This includes cooking oils, matches, and medical supplies. Store below the waterline and issue in small quantities.
 - Decorative equipment and articles that are useful in times of peace but do not contribute to fighting efficiency: Glass in bulletin boards, overhead paneling, surveyed items, etc.
 - Ensure that equipment vital to the safety of the ship and crew is in stock in the proper quantity on board. These items include all repair locker inventory and issued CBR PPE.
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Chapter 10: Personnel Casualty Procedures

Introduction This chapter discusses general procedures for first aid, immobilization, and transportation of victims in the event of injury.

In This Chapter This chapter contains the following sections:

Section	Title	Page
A	General Procedures in Case of Injury	10-2
B	Personnel Casualty Immobilization and Transportation	10-7

Section A: General Procedures in Case of Injury

A.1. Head-to-Toe Technique The most common technique used to evaluate victims, both conscious and unconscious, is the head-to-toe technique. The head-to-toe technique examination initially appears to be a long process, but as a first responder gains experience, the technique can be accomplished in just a few minutes.

This technique is divided into five areas:

- Head.
- Chest.
- Abdomen.
- Lower extremities.
- Upper extremities.

Each of these areas has specific tasks a first responder completes before moving to the next head-to-toe technique area.

A.2. Symptoms to Look For The head-to-toe technique is a systematic approach used when performing a victim evaluation. Traditionally, a head-to-toe technique examination is started with the head. However, most medical authorities now recommend examining the neck first in an effort to detect possible spinal injuries. During a head-to-toe technique examination, look for the following:

- Discolorations.
- Deformities.
- Penetrations.
- Wounds/bleeding.
- Any unusual chest movements.

A.3. Symptoms to Feel For During a head-to-toe technique examination, feel for the following:

- Deformities.
 - Tenderness.
 - Abnormal hardness.
 - Abnormal softness.
 - Spasms.
 - Skin temperature.
-

A.4. Symptoms to Listen For	During a head-to-toe technique examination, listen for any unusual breathing sounds.
A.5. Protective Equipment	First responders wear all necessary PPE, such as exam gloves, when conducting a head-to-toe technique examination.
A.6. Procedures	<p>When performing a patient evaluation of the head:</p> <ul style="list-style-type: none">• Kneel beside the victim’s head.• Check for breathing by visually observing the rise and fall of the chest and by listening and feeling for the victim’s breath.• Quickly take a visual overview of the victim’s body.• Gently slide your hands, palms up, under both sides of the victim’s neck to check the back of the neck and base of the skull for tenderness and deformity.• Visually inspect the front of the victim’s neck for indications of injury, such as a deviated trachea (breathing tube) from the midline of the neck, bruises, deformities, and/or penetrating injuries. If unconscious, assume the victim has a spinal injury.• Inspect the victim’s scalp starting at the top of the head and gently run your gloved fingers through the victim’s hair keeping the victim’s head immobile to avoid aggravating an existing spinal injury and to prevent further injuries. Gently use your hands and fingers as any pressure on the scalp has the possibility of driving bone fragments or dirt into wounds.• Inspect the victim’s face for deformities and depressions by visually examining facial bones for signs of fractures. If injuries are not visible, use your hands to gently feel the cheekbones, forehead, and lower jaw. Inspect the victim’s ears and nose, while keeping the head immobile, for cuts, tears, burns, and the presence of blood or clear fluids.

NOTE:

Blood and clear fluids in the ears or nose are strong indicators of a skull fracture.

A.7. Chest	<p>Gently feel the following areas of the chest for possible unseen fractures:</p> <ul style="list-style-type: none">• Clavicles (collarbones): Use your fingers to feel for deformities or tenderness.• Sternum (breastbone): Use your fingers to feel for deformities or tenderness.
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- Rib cage: Place your hands on both sides of the rib cage and apply gentle pressure. If there is a fracture of the rib cage, the compression causes pain.
- Scapulae (shoulder blades): Slide your hands under the shoulder blades and feel for deformities or tenderness.

A.8. Abdomen

When performing a patient evaluation of the abdomen:

- Visually inspect the victim's abdomen for obvious signs of injuries, such as abdominal distension, cuts, bruises, penetrations, open wounds with protruding organs (evisceration), or burns.
- Gently feel the victim's entire abdomen for tenderness, tight (rigid), or swollen (distended) areas while noting any attempts to protect his or her abdomen (e.g., victim drawing up the legs) or facial expressions indicating pain (e.g., grimacing).
- Gently slide your hands under the void created by the curve of the spine and apply gentle pressure to check the victim's lower back for point tenderness and deformities. This step can be postponed until the victim's entire back is exposed during preparation for being placed on an approved stretcher/litter, such as a Stokes or search and rescue (SAR) litter.
- Visually inspect the victim's pelvis for obvious injuries.
- Gently slide your hands down both sides of the small of the victim's back and apply compression downward and then inward to check the stability of the pelvic girdle (hips), feeling for deformities and noting any painful responses from the victim. Hip joint injury or fracture to the pelvis is possible if a grating sound is heard.
- Visually inspect for any obvious injuries to the genital region such as bleeding wounds, objects impaled in the area, or burns.

A.9. Lower Extremities

When performing a patient evaluation of the lower extremities:

- **DO NOT** move, lift, or rearrange the victim's lower extremities (legs and feet) before or during the examination to avoid further injury to the victim.
- Visually inspect for obvious injuries by inspecting each limb, one at a time, from hip to foot comparing each limb to the other as you go.
- If there are not any obvious injuries, rearrange or remove clothing and footwear in a manner that does not aggravate any possible injuries, such as cutting along the seams and removing only enough to properly examine the affected area to prevent or mitigate shock.

- Gently slide your hands down both sides of each leg and over each foot checking for tenderness or deformities and noting any painful responses from the victim.
- Check for impaired capillary refill due to possible injury (e.g., shock, major artery supplying the limb being pinched, severed, blocked, etc.) or from splints or bandages.
- Pinch and release each toe. The color (blood) should return to the area immediately. If more than two seconds pass before color returns, capillary refill is considered delayed. If splints or bandages are applied, check for capillary refill again to make sure circulation is not impaired.
- Check for nerve function and possible paralysis of the lower extremities. A victim's inability to perform any of the following tasks might be an indication of nerve damage. When nerve damage is suspected, assume the victim has a spinal injury.
 - Without allowing the victim to see you or your actions, touch a toe on each foot and ask the victim which toe it is.
 - If the victim cannot feel your touch or if the sensations in each foot are not the same, assume nerve damage in the limb or a spinal injury has occurred.
 - If sensations appear normal and no injuries are present, have the victim wiggle his or her toes.
 - Ask the victim to gently press the soles of his or her feet against your hand.

A.10. Upper Extremities

When performing a patient evaluation of the upper extremities:

- **DO NOT** move, lift, or rearrange the victim's upper extremities (arms and hands) before or during the examination to avoid further injury to the victim.
- Visually inspect for obvious injuries by inspecting each arm, one at a time, from shoulder to hand comparing each arm to the other as you go.
- If there are not any obvious injuries, rearrange or remove clothing and hand wear in a manner that does not aggravate any possible injuries, such as cutting along the seams and removing only enough to properly examine the affected area to prevent or mitigate shock.

- Gently slide your hands down both sides of each arm and over each hand checking for tenderness, swelling, bruising, or deformities and noting any painful responses from the victim as any of these might indicate a fracture.
 - Check for capillary refill.
 - Check for nerve function and possible paralysis of the upper extremities by asking the victim to squeeze your fingers as hard as possible to evaluate strength in each hand. The inability of the victim to perform this task might be an indication of nerve damage.
 - If there are not any indications of injury to the head, neck, spine, upper or lower extremities, chest, or abdomen, gently roll the victim, as a unit, toward your knees and inspect the surface of the back for bleeding or obvious injuries. This step can be postponed until the victim's entire back is exposed during preparation for being placed on an approved stretcher/litter, such as a Stokes or SAR litter.
-

Section B: Personnel Casualty Immobilization and Transportation

- B.1. Overview** The purpose of patient immobilization is to:
- Prevent damage or injury to the spinal column during medical care and transport.
 - Stabilize damage or injury to the spinal column to prevent aggravation during medical care and transport.
 - Minimize additional stress and secure a victim with a suspected spinal column injury to a medically approved transportation device, such as a Stokes or SAR litter.
 - When a spinal column injury, such as a fracture, is sustained the spinal cord might be crushed, cut, or otherwise damaged so severely that permanent paralysis or death might occur. A full recovery is possible if the spinal cord is not seriously damaged and the victim is properly cared for (including proper patient immobilization).
 - During spinal column injuries, any twisting or bending of the neck or back is likely to cause irreparable damage to the spinal cord.
-
- B.2. Immobilization Procedures** Properly immobilize any victim suspected of having a spinal column injury. Place victim on an approved stretcher/litter before transporting and ensure a crewmember is stationed at the victim's head to maintain C-spine. Use one of the two main methods to place the victim on the stretcher/litter: log roll method or straddle slide method.
-
- B.2.a. Log Roll Method** The log roll method has the crewmembers roll the victim onto his or her side and then roll the victim back onto the approved stretcher/litter. When immobilizing the spinal column using the log roll method:
- Four crewmembers take positions at the head/neck, just below the shoulders, at the waist, and at the knees, all on the same side of the victim.
 - As a single unit, the four crewmembers roll the victim towards themselves on command of the crewmember stationed at the head of the victim, aware this crewmember is maintaining C-spine precaution.
 - A crewmember positions the stretcher/litter beneath the victim with victim's back facing the stretcher/litter. Do not place anything on the stretcher/litter as it might cause unnecessary movement of the victim's spine and neck.

- As a single unit, the four crewmembers roll the victim back onto the stretcher/litter.
- Secure the victim on the stretcher/litter using the straps. Begin with the trunk of the body and work your way down to the feet, securing the head last. The crewmember stationed at the victim's head maintains C-spine precaution throughout the entire securing process.
- Lift the victim using the handles on the stretcher/litter **only** if there are a sufficient number of crewmembers available.
- Carry the victim with his or her head facing the direction traveled.

B.2.b. Straddle Slide Method

The straddle slide method has the crewmembers slide the stretcher/litter under the victim while being held immobile. It is used when a victim is in a narrow space or passageway and there is no room for the rescuers to kneel beside the victim.

When immobilizing the spinal column using the straddle slide method:

- Four crewmembers take positions: three straddling the victim at the head/neck, just below the shoulders, at the hips, and one kneeling at the victim's head with a stretcher/litter.
- The crewmember at the head/neck supports the victim's head and neck while he or she, along with the two crewmembers positioned just below the shoulders and at the hips, as a single unit, lift the victim.
- The crewmember positioned at the victim's head slides the stretcher/litter under the victim.
- As a single unit, the three crewmembers lower the victim onto the stretcher/litter.
- Secure the victim on the stretcher/litter.
- Lift the victim using the handles on the stretcher/litter **only** if there are a sufficient number of crewmembers available.
- Carry the victim with his or her head facing the direction traveled.

WARNING:

Four is the optimum number of crewmembers needed (two on each side) when lifting and transporting a victim. More crewmembers ensure an easier transportation process on the victim and the crew. Two crewmembers can exacerbate the injury or cause more injuries.

Appendix A: Glossary & Acronyms

AFFF	Aqueous film forming foam.
APC	Aqueous potassium carbonate.
ATC	Air test cap.
BTL	Bottle.
C	Ceiling.
CBR	Chemical, biological, and radiological warfare.
CBRNE	Chemical, biological, radiological, nuclear, high-yield explosive.
CIWS	Close-In Weapons System.
CO	Commanding officer.
CO2	Carbon dioxide.
Cold work	A term used for operations involving inspections, cleaning, or minor repair where no hot work will be conducted. Examples include space inspections, spray painting, chemical cleaning, and the use of any strippers, thinners, paints, or cleaners that produce vapors.
Compt	Compartment.
DC	Damage control.
DC Central	Damage Control Central.
DCA	Damage control assistant.
DCTT	Damage control training team.

DOPR	Diesel oil purifier room.
EEBD	Emergency escape breathing device.
EMCON	Emission control.
EO	Engineer officer.
EOW	Engineering officer of the watch.
EPO	Engineering petty officer.
FB	Fire boundary.
FFW	Firefighting water.
FM 200	A fire suppression agent used as an alternative to Halon 1301 in new ship design applications. Also known as heptafluoropropane (HFP). FM 200 is a colorless, odorless, and electrically non-conducting gas.
FO	Fuel oil.
FORCECOM	U.S. Coast Guard Force Readiness Command.
F/O/Supply	Fuel oil supply.
FOWK	Fuel, oil, and water king.
FPG	Firefighter protective gear.
FPL	Fire plug.
FR	Frame.
GE	General emergency.
GFE	Gas free engineer.

GFEA	Gas free engineer assistant.
GFEP	Gas free engineering personnel.
GM	Metacentric height.
GPOW	Gangway petty officer of the watch.
GQ	General quarters.
Gr Lckr	Gear locker.
H2S	Hydrogen sulfide.
Halon 1301	A fire suppression agent. Known chemically as bromotrifluoromethane. For shipboard installation, Halon 1301 is super-pressurized with nitrogen and stored in gas cylinders as a liquid. When released, it vaporizes to a colorless, odorless gas with a density approximately five times that of air.
HAZMAT	Hazardous material.
HERO	Hazardous electromagnetic radiation to ordnance.
ID	Identification.
IDLH	Immediately dangerous to life and health.
IET	Inport emergency team.
IPDS	Improved point detection system.
IPDS-LR	Improved point detection system life cycle replacement.
LB	Pound.
LPA	Low pressure air.
Mag.	Magazine.
mg/m³	Milligrams per cubic meter of air.

mm	Millimeter.
Main Ctrl	Main control.
MSFD	Machinery Space Firefighting Doctrine for Class Bravo Fires.
NIOSH	National Institute for Occupational Safety and Health.
OOD	Officer of the deck.
OSL	On-scene leader.
PECU	Portable exothermic cutting unit.
PEL	Permissible exposure limit.
PKP	Potassium bicarbonate powder.
POC	Point of contact.
PPE	Personal protective equipment.
PRI	Primary.
PRIFLY	Primary flight control.
QAWTD	Quick acting watertight door.
R-22	An air conditioning refrigerant of choice for more than four decades. Unfortunately, R-22 has been proven to contribute to ozone depletion. Accordingly, the production of R-22 is scheduled to be phased out over the coming years.
R-134	An air conditioning refrigerant with properties similar to R-22, but with less ozone depletion potential.
R&A	Rescue and assistance.
RF	Radio frequency.

Rm	Room.
RRT	Rapid response team.
SAR	Search and rescue.
SB	Smoke boundary.
SCBA	Self-contained breathing apparatus.
SEC	Secondary.
SOP	Standard operating procedure.
SOPA	Senior officer present afloat.
STRM	Storeroom.
TTP	Tactics, techniques, and procedures.
V	Volt.
Wks	Workshop.
WTD	Watertight door.
XO	Executive officer.

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Appendix B: Inport Checklists for Toxic Gas Bill

Inport Checklists for Toxic Gas Bill	
OOD Actions	
	<p>Ring the bell rapidly for 5 seconds.</p> <p>Pipe over the 1MC:</p> <p>For leak of known origin: “Toxic gas, toxic gas. There is _____ gas present in compartment(s) _____ . Rapid Response Team, investigate. All other hands stand clear of (name of compartment). All personnel on today’s duty section lay to [Repair locker furthest from toxic gas]. All personnel not on today’s duty section lay to the flight deck/muster point.”</p> <p>For leak of unknown origin: “Toxic gas, toxic gas. There is a toxic gas of unknown origin present in compartment(s) _____ . Rapid Response Team, investigate. All other hands stand clear of (name of compartment). All personnel in today’s duty section lay to [Repair locker furthest from toxic gas]. All personnel not in today’s duty section lay to the flight deck/muster point.”</p> <p>Ring the bell rapidly for 5 seconds.</p>
	Secure the brow to all non-essential traffic.
	Establish communications to Repair Locker via phone or radio.
	Order toxic gas boundaries.
	Repeat applicable pipe every 5 minutes.
	After trunked fan is set up, pipe over the 1MC: <i>“All hands stand clear of ventilation equipment and ventilation exhaust.”</i>
	Notify the Fire Department, adjacent commands.
	Direct the gas free engineer (GFE) or gas free engineer assistant (GFEA) to test compartments working toward the affected space.
	When notified that GFE/GFEA has conducted atmospheric tests and the space is certified safe for personnel, pipe over the 1MC: <i>“Compartment (number), (noun name) is now open for normal use.”</i>

Rapid Response Team (RRT) Actions	
	Don SCBAs.
	Confirm reported location of toxic gas location (compartment number and noun name) to repair locker leader/pilothouse.
	Set and maintain toxic gas boundaries.
	Verify that the affected area is clear of personnel.
	Rescue any personnel overcome by the gas in the affected space (EEBDs can be given to conscious victims).
	Secure installed ventilation to the affected space unless ventilation is designed to evacuate that space.
	Locate and isolate the source of toxic gas.
	Request reliefs/assistance from locker if needed.
	Set up the trunked fan to ventilate with locker assistance.
Attack Team Actions (If/when requested by the RRT)	
	Don SCBAs.
	Obtain pass-down from the RRT on status of boundaries, personnel casualties, and installed ventilation.
	Locate and isolate the source of toxic gas.
	Obtain NIOSH information for the substance causing the toxic gas.
	While wearing proper PPE, begin clean up of source per NIOSH (if necessary).
	Set up trunked fan or appropriate equipment to ventilate compartment per the Toxic Gas Hazards table in B.2 List of Toxic Gases/Vapors , page 6-7.
	Request OOD pipe over the 1MC for all hands to stand clear of ventilation equipment and ventilation exhaust before energizing RAM FAN.
	Request GFE conduct atmospheric tests.
	Stand down from Toxic Gas Bill once GFE/GFEA has certified space safe for personnel.

Appendix C: Underway Checklist for Toxic Gas Bill

Underway Checklists for Toxic Gas Bill	
OOD Actions	
	<p>Ring the bell rapidly for 5 seconds.</p> <p>Pipe over the 1MC:</p> <p>For leak of known origin: “Toxic gas, toxic gas. There is _____ gas present in compartment(s) _____ . Rapid Response Team, investigate. All hands stand clear of (name of compartment.)”</p> <p>For leak of unknown origin: “Toxic gas, toxic gas. There is a toxic gas of unknown origin present in compartment(s) _____ . Rapid Response Team, investigate. All other hands stand clear of (name of compartment.)”</p> <p>Ring the bell rapidly for 5 seconds.</p>
	Repeat applicable pipe every 5 minutes.
	Upon recommendation of the DCA/EPO, establish a safe course with appropriate relative winds across the decks to allow for ventilation of the affected space.
Rapid Response Team (RRT) Actions	
	Don SCBAs.
	Confirm reported location of toxic gas location (compartment number and noun name) to DC Central/pilothouse.
	Set and maintain toxic gas boundaries.
	Verify that the affected area is clear of personnel.
	Rescue any personnel overcome by the gas in the affected space (EEBDs can be given to conscious victims).
	Secure installed ventilation to the affected space unless ventilation is designed to remove toxic gas.
	Locate and isolate the source of toxic gas.
	Request reliefs/assistance from locker if needed.
	Set up the trunked fan to ventilate with Attack Team’s assistance.
	Request gas free engineer (GFE) conduct atmospheric tests.
	Request OOD pipe over the 1MC for all hands to stand clear of ventilation equipment and ventilation exhaust before energizing trunked fan.

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 Repair Party for Large Cutters (210 feet & above)

DCA/EPO	
	Establish communications via phone or radio.
	Confirm toxic gas boundaries are set with RRT.
	Look up NIOSH for toxin. Pass PPE needed to response personnel.
	After trunked fan is set up, pipe over the 1MC: <i>“All hands stand clear of ventilation equipment and ventilation exhaust.”</i>
	Have gas free engineering personnel (GFEP) calibrate gas free equipment and commence inward testing towards compartment.
Attack Team Actions (If/when requested by the RRT)	
	Don SCBAs.
	Obtain pass-down from the RRT and investigators on status of boundaries, personnel casualties, and installed ventilation.
	Locate and isolate the source of toxic gas.
	While wearing proper PPE, begin clean up of source per NIOSH (if necessary).
	Set up trunked fan to ventilate compartment with RRT’s assistance.
	Request OOD pipe over the 1MC for all hands to stand clear of ventilation equipment and ventilation exhaust before energizing the trunked fan.



Appendix D: Rescue and Assistance Bill

Underway Checklists	
OOD Questions for Vessel in Distress	
	Date:
	Vessel name:
	Vessel location:
	Number of personnel onboard (adult/child):
	Description of flotation devices:
	Direct the passengers to put flotation devices on.
	Type of damage:
	Location of damage:
	If flooding, is there an installed dewatering system?
	Is it keeping up with the damage?
	Are there personnel casualties?
	Are there any vessels around you?

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Repair Party for Large Cutters (210 feet & above)

	Vessel POC:
	Vessel POC contact info (cell, address):
	Vessel owner name:
	Vessel owner contact info (cell, address):



Appendix E: Checklist for Shipboard Fires

Checklists for Shipboard Fires	
(checklist is scalable)	
	Fire/smoke reported in compartment _____.
	RRT away.
	Check fire main pressure (P-100 required? Yes or No).
	Repair lockers manned / ready: R2 _____ R3 _____.
	Investigators out - Time _____
	Order fire boundaries set (6 sides, Topside critical).
	Order smoke boundaries set (smoke curtains/blankets).
	Order electrical isolation.
	Order mechanical isolation.
	Secure ventilation.
	Secure fuel transfer.
	Space evacuated/casualties.
	DC Central/OOD notified.
	Command's mission affected? Yes or No .
	Notify TACON.
	Call 911 if in port.

CGTTP 3-91.3A
 Repair Party for Large Cutters (210 feet & above)

	Class of fire: Alpha / Bravo / Charlie / Delta.
	Fuel source secured.
	Electrical power secured.
	Installed firefighting systems activated.
	Status of flammable/explosive spaces near affected compartment.
	Check DC diagrams for color code per reference (f), Surface Ship Survivability, CGTTP/NTTP 3-20.31 (series).
	Magazine/fuel tanks/storerooms/compartments with batteries.
	Off duty ship's personnel required/back-up fire party location.
	Self-contained breathing apparatus (SCBA) change-out area set up (water, FPG, spare SCBA bottles).
	Investigators report at least every 15 minutes.
	Fire/smoke boundaries set:
	Fire boundary (FB) time.
	Smoke boundary (SB) time.
	Status of mechanical/electrical isolation.
	SCBA activation times (except investigators).
	Space entered (direct/indirect) - Time _____.
	Forcible entry required/portable exothermic cutting unit (PECU).
	Status of dewatering space firefighting water (FFW) (affecting stability, high/low in ship).
	Coordinate reliefs (SCBA change-out).

	Fire out - Time _____.
	Reflash watch set - Name _____.
	Desmoke (with EO's permission for installed ventilation).
	Oxygen test.
	Explosive test.
	Toxic test.
	Stand down from GE. Re-establish the watch.
	Major fire/vital system restoration (coordinate with EOW).
	Post fire-damage report.

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Appendix F: Additional Resources

CART Checklists (updated June 2013)	
	<ul style="list-style-type: none">• http://cgweb.comdt.uscg.mil/CG-751/programs/CART.htm (Select the Damage Control (DC) link.)
Other useful references	
	<ul style="list-style-type: none">• Sound-Powered Telephone Talkers Manual, COMDTINST M9430.1• Chemical, Biological, Radiological and Nuclear (CBRN) Policy for the Coast Guard Expeditionary Forces, COMDTINST 3400.4 (series)• Cutter Standard Repair Locker Inventory, COMDTINST 9664.1 (series)• Standard Repair Party Manual for Naval Surface Force, COMNAVSURFORINST 3541.1 (series)• Naval Ships' Technical Manual (NSTM), Chapter 470 Shipboard BW/CW Defense and Countermeasures, S9086-QH-STM-010 (series)• Naval Ships' Technical Manual (NSTM), Chapter 079, Volume 1: Damage Control, Stability and Buoyancy, S9086-CN-STM-010 (series)

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