(2) Must not project into the water stream.

(3) Check by feeling to insure there is a gasket and that it is in place.

7. Care of fittings.

a. Protect threads.

b. Prevent corrosion.

c. Do not drop.

C. All-purpose Nozzle.

1. Two sizes - 2½" and 1½".

2. Has female hose fittings.

3. Valve has three positions:

a. Forward position - shut off.

b. Up and down position - fog

(1) High velocity - with H.V. tip.

(2) Low velocity - with applicator replacing tip.

(a) 4-foot applicator - 60° bend, 1½" nozzle.

(b) 10-foot applicator - 90° bend, 1½" nozzle.

(c) 12-foot applicator - 90° bend, 2½" nozzle.

c. Aft position - straight stream.

4. Many Navy all-purpose nozzles and high and low velocity nozzles are exposed to the weather. They should not be cleaned with brightwork polish or emery cloth since this will clog the outlets. Instead, brass parts of the NAP and fog nozzles should be kept clean with fine steel wool and wiped lightly with rust preventive compound. The nozzles should be covered with saran-wrap paper or equivalent to keep them clean and ready for use.

D. Foam Equipment.

1. Mechanical foam nozzle.

a. 21" section of asbestos composition or flexible metal.

b. 2" diameter outlet.

c. Suction chamber.

d. Air port (aspirating cage).

e. Female hose fitting, 1½" at suction chamber end.

2. Pickup tube (NPU tube).

a. Short piece of 5/8" hose.

b. Short length of flexible hose.

c. Threaded fitting on hose fits into suction chamber of mechanical foam nozzle.

3. Mechanical foam.

a. Liquid, in 5 gallon cans, 50 lbs. per can.

b. Drawn into suction chamber of mechanical foam nozzle through pickup tube.

c. 5 gallons of liquid makes approximately 660 gallons of foam in $1\frac{1}{2}$ minutes by mixing with water and air.

E. Quick-cleaning Strainer.

1. Provided to prevent clogging of nozzles by marine growth, salt and rust.

2. Built into fire hydrants.

3. Has two outlets.

a. Hose outlet is open at all times.

b. Cleaning outlet is controlled by handle.

(1) In closed position, all water from hydrant goes to hose.

(2) In open position, water goes through cleaning outlet to deck.

c. To operate:

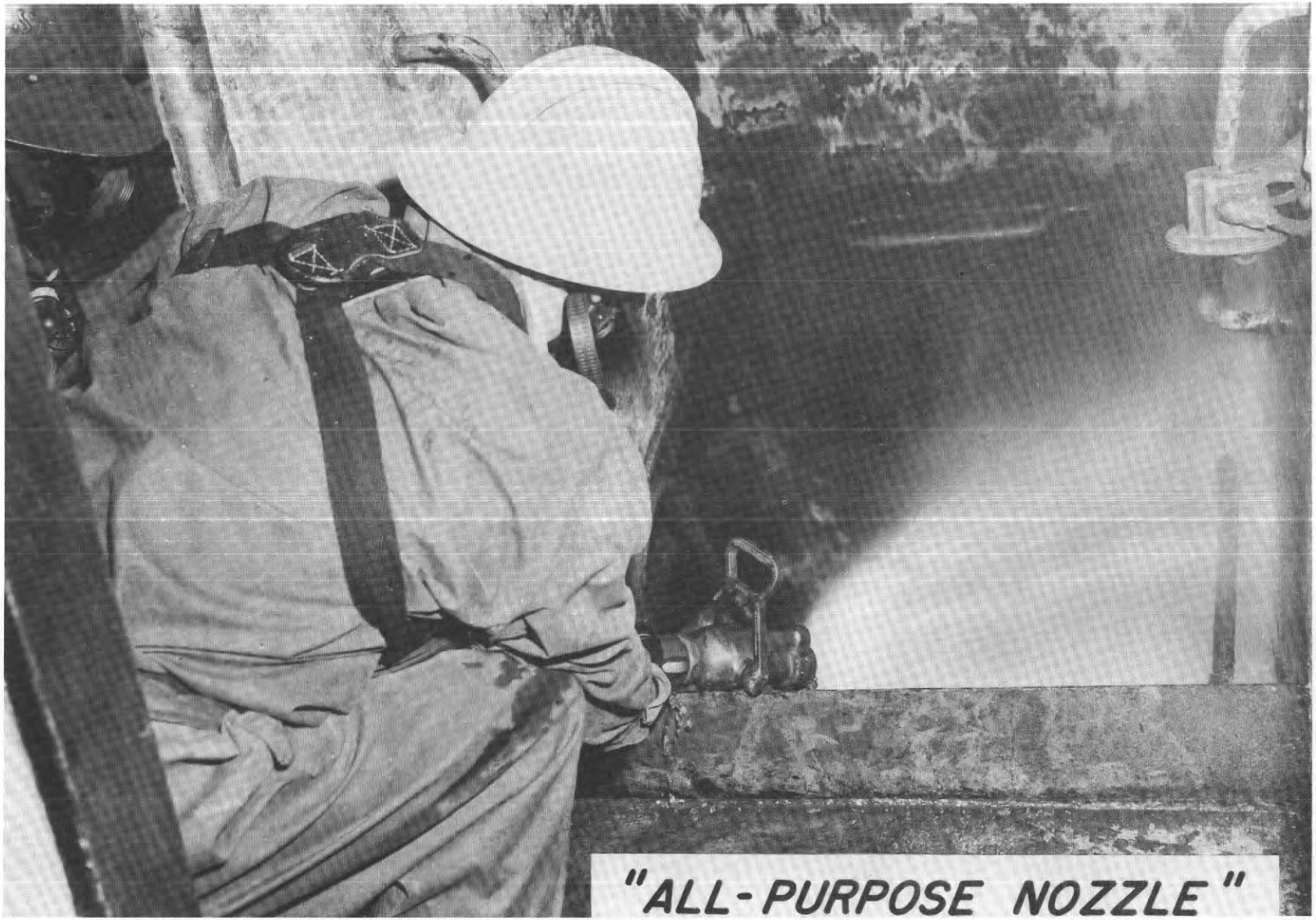
(1) Open hydrant all the way.

(2) Then, open strainer to flush out.

(3) Strainer should be flushed out each time hydrant is used.

F. Capabilities and Use of Nozzles.

1. All-purpose nozzle.



"ALL-PURPOSE NOZZLE"

a. High velocity fog, $2\frac{1}{2}$" and $1\frac{1}{2}$".

(1) Provides circle of fog 8' in diameter, 20' from nozzle, at 100 lbs. pressure.

(2) Excellent for cooling rubbish and oil fires.

(3) Pushes flame and smoke away from nozzle.

(4) Provides protection for nozzlemen.

b. Low velocity fog.

(1) $2\frac{1}{2}$" with applicator provides circle of fog 22 feet in diameter at 100 lbs. pressure.

(2) $1\frac{1}{2}$" with applicator provides circle of fog 16 feet in diameter at 100 lbs. pressure.

(3) Spray is right at the fog head.

(4) It provides a finer spray than the high velocity fog.

(5) It is excellent for cooling bulkheads, decks, and areas in which fire has been extinguished.

(6) It provides an excellent protective screen for fire parties or for a team applying foam.

c. Straight stream, $2\frac{1}{2}$" and $1\frac{1}{2}$".

(1) Projects stream approximately 70 feet at 100 lbs. pressure.

(2) Excellent for penetrating and breaking up rubbish fires.

(3) Never use a straight stream of water on oil fires as it will spread the fire.

2. Mechanical foam nozzle.

a. Essential to make foam from liquid foam.

b. Mixes foam and water.

c. Then mixes in large quantities of air in the air port.

d. Discharges 660 gallons of mechanical foam for each 5-gallon can of liquid foam.

e. Excellent for smothering oil fires.

(1) Flows over burning surfaces and cuts off oxygen.

(2) Stream of foam should be directed against bulkhead.

(3) If foam is pointed directly at the fire, it will not provide an unbroken blanket; thus permitting re-ignition.

(4) It flows freely around stanchions and other obstructions.

V. SUMMARY.

A. Fire Hose.

1. Faking - insure that nozzle end is on the outside ready to be run out.

2. Rolling.

a. Male threads protected.

b. Hose is easily run out, male end toward fire.

B. Fittings.

1. Y-gate.

2. Double female coupling.

3. Double male coupling.

4. Reducer coupling.

5. Spanner.

6. Gasket, always check by feeling.

C. All-purpose Nozzle.

1. Fog.

a. High velocity.

b. Low velocity.

2. Straight stream.

D. Mechanical Foam Nozzle.

1. NPU tube.

2. Five gallons of liquid makes 660 gallons of foam in $1\frac{1}{2}$ minutes.

E. Quick-cleaning Strainer.

VI. TEST AND APPLICATION.

A. Quiz. Use these and additional questions as an oral quiz.

1. Q. Describe how to coil a hose for stowage in repair lockers.

A. Lay hose out on deck full length and then double it up with the male end brought about 4 feet short of the female end. Start rolling at the fold, toward the ends. When completely rolled, the male end will be inside the outer roll of hose, thus protecting the threads. Secure coil with small line.

2. Q. Describe the valve controls of an all-purpose nozzle.

A. Handle forward is the shut-off position; handle straight up and down is the fog position; handle aft is the straight-stream position.

3. Q. What three things are mixed in a mechanical foam nozzle?

A. Liquid foam, water, and air.

4. Q. State the differences between high velocity and low velocity fog.

A. High velocity fog is projected in a cone for some distance from the nozzle. Low velocity fog is a finer spray provided by an applicator inserted into the all-purpose nozzle. It covers a larger area but is centered right at the fog head.

5. Q. What is the most general use for a double female coupling?

A. Rigging a hose jumper around a broken firemain section.

6. Q. How do you make sure there is a gasket in place in a fitting or nozzle?

A. Check by feeling the gasket with your hand.

7. Q. How long does it take to use up a 5-gallon can of foam?

A. Approximately $1\frac{1}{2}$ minutes.

8. Q. Why is a straight stream of water not used on all classes of fires?

A. It is used only on rubbish and trash fires. A straight stream of water will not extinguish an oil fire; it will cause it to spread. Water will conduct electricity, making a straight stream dangerous on electrical fires.

9. Q. Which end of a hose is led toward the fire? Why?

A. The male end. All nozzles have female fittings which are screwed onto the male end of the hose. The other female end of the hose is screwed onto the hydrant.

10. Q. When do you flush out fire mains with the quick-cleaning strainer?

A. Each time you use the hydrant.

B. Application. Take the group to a convenient hydrant on the open deck and demonstrate and have them perform the following operations.

1. Placing Y-gate on hydrant.

2. Uncoiling $1\frac{1}{2}$" hose.

3. Connecting hose to Y-gate.

4. Putting all-purpose nozzle on hose.

5. Opening hydrant valve.

6. Flushing out quick-cleaning strainer.

7. Opening valve on Y-gate.

8. The three control positions of the all-purpose nozzle.

9. Inserting a 4-foot applicator.

10. Low velocity water fog from the applicator.

11. Connecting the mechanical foam nozzle and NPU tube.

12. Discharging water through mechanical foam nozzle (foam may be used if convenient).

13. Draining hose.

14. Coiling hose.

15. Faking hose.

CHAPTER 2

BASIC DAMAGE CONTROL - For All Hands (Lesson Plan)

Section 2.9

FIRE DETECTING SYSTEM (HIGH TEMPERATURE)

I	Objectives	IV	Presentation
II	Material	V	Summary
III	Introduction	VI	Test and Application

I. OBJECTIVES.

A. To explain the purpose of the fire detecting system.

B. To present the functions of manual boxes, test boxes, thermostats, and fire detecting circuits.

C. To explain maintenance techniques for the fire detecting system.

D. To demonstrate detection of individual circuits at the control panel on the bridge.

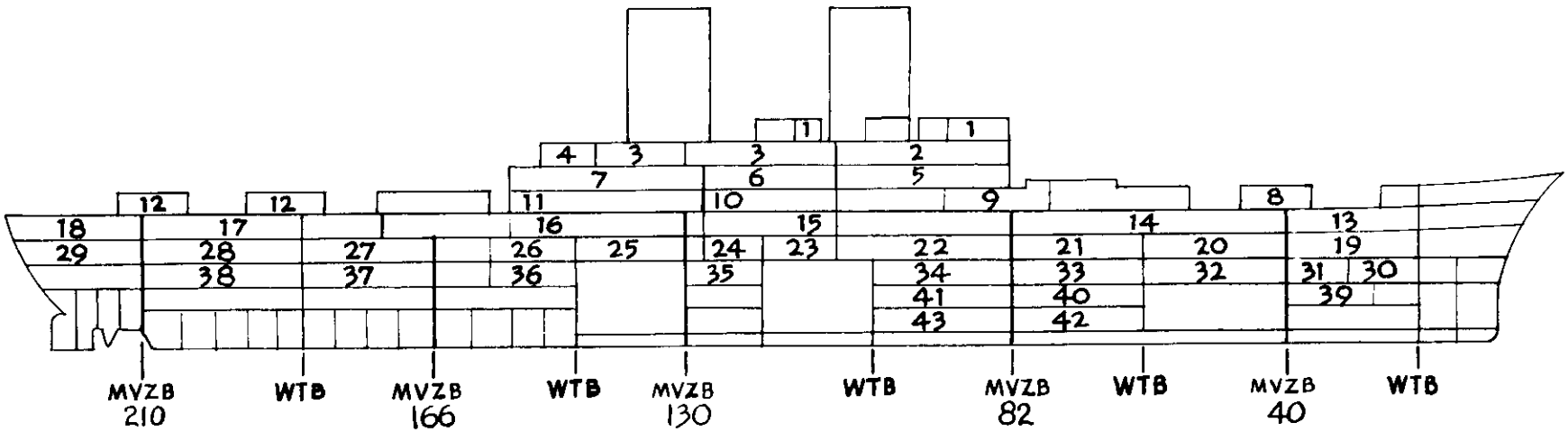
E. To explain USCG regulations concerning this installation.

II. MATERIAL.

A. Training Aids.

1. Plans, poster or sketch of ships' fire detecting system, zones and circuits.

2. Ship's thermostats, key box and manual break-glass box.



FIRE DETECTING CIRCUITS IN A P-2

B. References.

1. Ship's instruction book on installed fire detecting system.

2. Ship's damage control display plans.

3. CG-256, Rules & Regulations for Passenger Vessels, 76.27.

4. Operating instructions on battery charging.

C. Handout. The presentation portion (VI) of this lesson plan may be mimeographed as a handout.

III. INTRODUCTION.

A. Introduce self and subject (zonit fire detecting system (high temperature)).

B. Arouse interest by stressing the importance of:

1. Knowing the location of the nearest manual break-glass station.

2. Knowing the proper operation of the detecting cabinet in order to locate the general area of a fire.

3. Maintaining thermostat units free of paint.

4. Conducting routine inspections and tests of fire detecting and alarm units.

5. Knowing of the dual power supply for the fire detecting system.

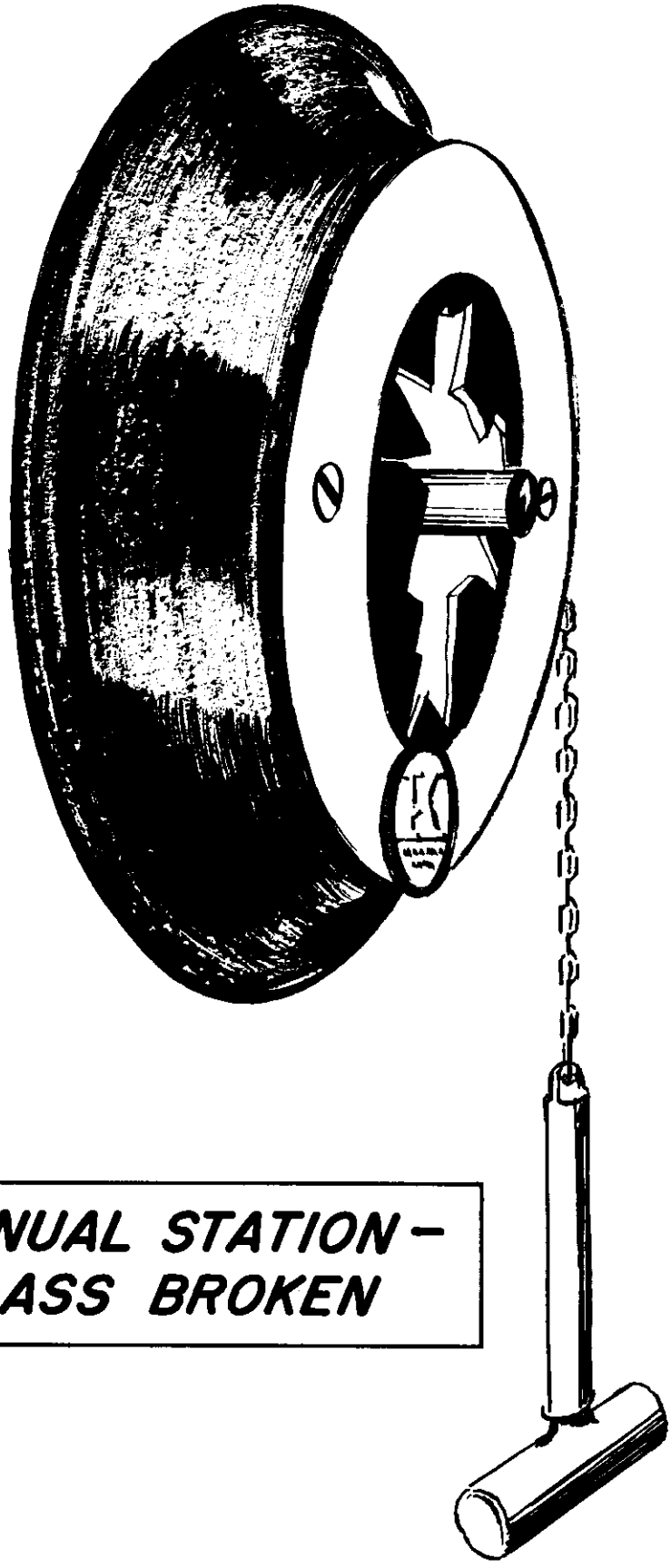
C. Explain that the degree of interest and detailed knowledge of the system will depend upon the rating, but that all-hands must know the general operation of the system, how to turn in an alarm, precautions against false alarms, and proper routine maintenance procedures.

IV. PRESENTATION.

A. Purpose of the Fire Detecting System.

1. It is a combination automatic and manual fire detecting system to communicate the occurrence, presence and general location of fire to the bridge.

2. It provides for detection of fires in protected spaces.



MANUAL STATION - GLASS BROKEN

3. It provides for protection of passengers and crew.

4. It also provides protection of cargo (if so installed).

B. Description of the System.

1. The fire detecting system is an automatic, electrically-controlled fire alarm system. It is a closed-circuit system of manual alarm stations and thermostatic circuits throughout all protected areas of the ship. An alarm is sounded on the bridge when either a fixed-temperature thermostat or a manual break-glass station is activated or when a circuit is tested at its key test station.

a. To report a fire by the break-glass system, stand on either side of the box to protect your eyes. Break only the glass! This releases the plunger. If you press in on this plunger you will shut off the alarm and cause unnecessary delay at the control panel.

2. Blackboard diagram explanation. (Copy diagram from your ship's instruction book on the fire detecting system.)

a. The system consists of a series of thermostats, manual break-glass stations, and a number of key-test stations.

b. All components are connected in series but are divided into groups or zones by the return wires to the main panel on the bridge.

c. Any open circuit will ring the alarm gong or bell in the panel box on the bridge and will also set off an alarm in the engine room.

d. The detection zone or area in which the alarm originates is located by operation of the fire zone locating switches on the panel and then referring to the system's chart.

e. Key test stations located near each manual break-glass stations are used to check circuits by opening the circuit test switch with a special key. When inserted and turned, the alarm is set off.

f. Thermostats are of the bimetallic type; normally closed; they set off the alarm when opened by excessive heat. Ordinarily 135° F. thermostats are used but higher rating thermostats are used in galleys.

g. The detection system obtains electrical power from the ship's normal supply or through batteries in case of ship's power failure. Batteries are kept fully charged by connection to the ship's power at all times.

C. Location of Equipment.

1. The master or control panel is located on the bridge, in the wheelhouse, chart room, or some place under constant observation.

2. Branch circuits from the main panel lead to thermostats which are located in such spaces as required by Coast Guard regulations.

3. Branch circuits which control the thermostats are divided into zones or spaces as prescribed by Coast Guard regulations.

4. Location of circuits depends on these factors:

a. Size of ship.

b. Design of ship.

c. Areas to be protected.

d. Number of compartments to each zone.

e. Number of circuits required.

D. USCG Regulations. (NOTE: It will generally be sufficient to mention that USCG requires a fire detecting system and fire watch in passenger ships. These details may be omitted but are included as background information.) Passenger ships of 50 passengers or more:

1. Must have a fire-detecting system.

2. Must have a manual-operating fire alarm system and a fire watch, with the watchman reporting to the bridge hourly.

3. The fire detecting system must have a suitable number of stations.

4. Thermostats must not be installed over 15 feet apart.

5. The area protected by any single thermostat must not exceed 200 square feet.

6. Thermostat wire must not exceed 1000 feet in any one circuit.

7. Zoning.

a. Single circuits do not include more than 50 individual rooms or storage lockers.

b. Spaces separated by WT or main vertical bulkheads are not included in the same zone.

c. The detecting system is installed so that if any one circuit becomes inoperative, the remaining circuits will not be affected.

(1) Any circuit or number of circuits may sound an alarm at the same time.

8. Markings of manual alarm boxes.

a. Manual alarm boxes are marked "IN CASE OF FIRE, BREAK GLASS".

b. Alarm bells installed in the engine room on the bridge are stenciled in one-inch lettering, "FIRE ALARM".

E. Operation.

1. Main panel indications. The panel has two lights, a red and a white light. The white light is normally on to indicate the system is operating.

a. When the fire alarm sounds, the red light will light up.

(1) This indicates one of the following:

(a) A thermostat activated by fire.

(b) A thermostat activated by heat above the thermostat's rating.

(c) A manual station glass broken.

(d) A broken circuit wire.

(2) To stop the alarm and isolate the detection zone giving the alarm:

(a) Depress all fire locating switches.

(b) Starting at one end, raise each switch one at a time, leaving down any switch that causes alarm to ring.

(c) After all switches have been tested, refer to the chart for the location of the fire as indicated by the depressed switch, (or switches).

LOCATING AREA OF FIRE

(d) Leave the cabinet door down until the fire is out or the defect is corrected. After the fire is out, raise all switches to allow the door to be closed. The switches are normally in the up position and the cabinet door is designed so that it will not close if any of the switches are down.

b. Sounding of trouble buzzer. (Note: This part may be omitted for most personnel).

(1) This indicates that a derangement exists.

(a) Turn the buzzer button to OFF position and the white light will show.

(b) The derangement may be any one of the following:

1. A ground in the thermostat wiring.

2. A failure due to low voltage.

3. A failure of battery power.

4. Broken wiring.

5. A defective engine room bell.

6. A blown fuse.

(2) To determine the trouble.

(a) Test for a ground.

1. Depress all switches on the panel, both fire and ground-detecting.

2. Turn the buzzer back on.

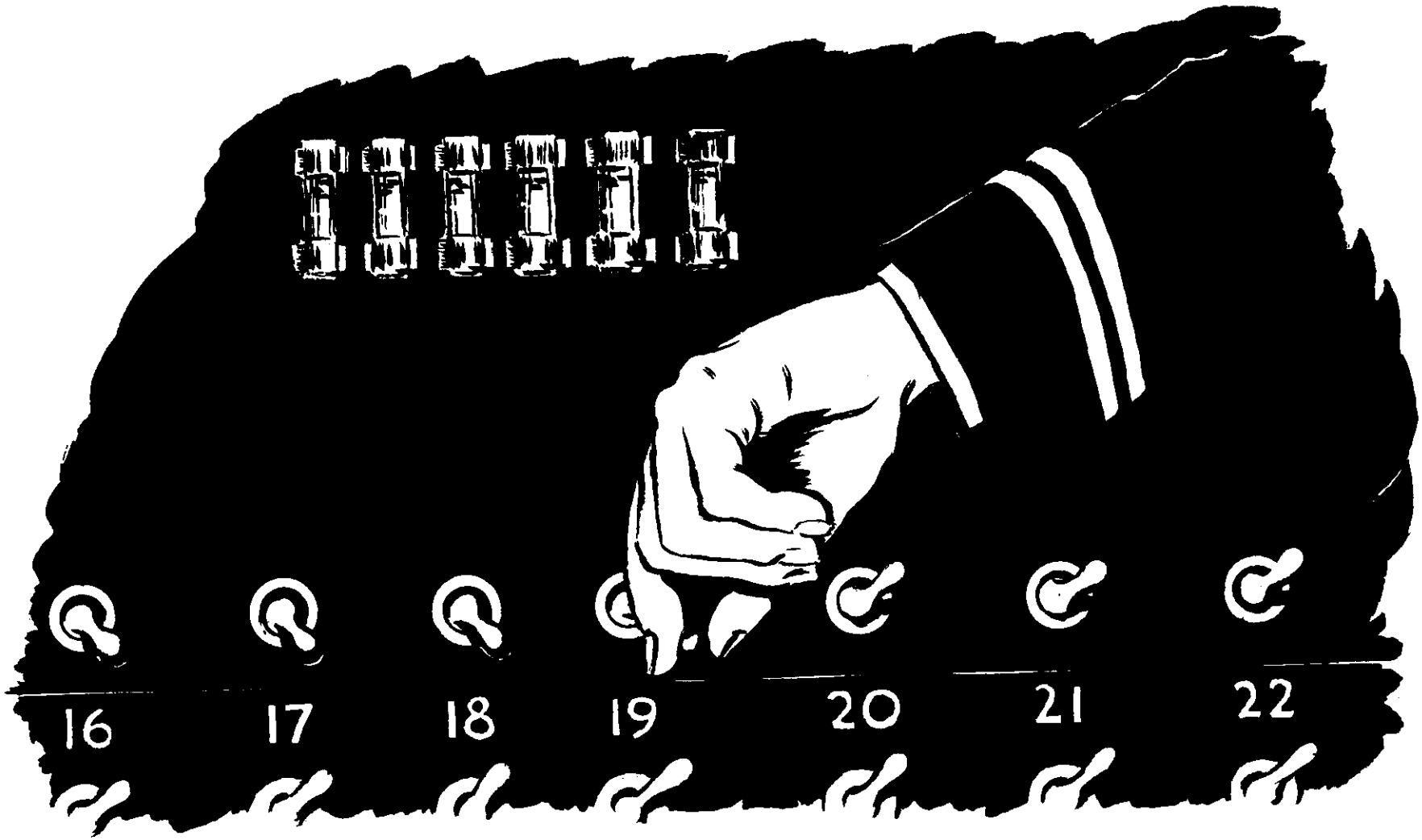
3. Press the main supply button.

4. Release main supply button. If buzzer still sounds, there is no ground.

5. If buzzer does not sound, the ground is then located by raising the ground-locating switches one by one.

(b) Test for failure of ship's power or battery.

1. Determine by voltmeter test.



TESTING FOR DEFECTIVE CIRCUIT

(c) Test for broken wire or defective engine room bell.

1. Depress any ground switch and see if bell or gong works.

(d) If all above fail--

1. Trouble is in the main panel.

2. Consult the wiring diagram.

3. To put the system back into normal operation after locating trouble.

a. With all switches in normal operating position, press the main supply button and the circuits will reset themselves. The system will then be in normal operating condition.

F. Maintenance of Systems.

1. Proper care of battery.

2. Keep system clear of grounds.

3. Tests. Every three months the USCG requires testing of the system for proper operation. Every test station key switch is opened in turn and the panel fire locating switches are operated to insure proper alarm and detection. All fuses are checked and each circuit is restored to proper operating condition.

V. SUMMARY.

A. Review ship's type of fire detecting system.

B. Functions of the various installed parts.

1. Manual break-glass stations. Stress the proper way to report a fire.

2. Key-test stations near each manual station to permit a manual test of each circuit.

3. Thermostats in the closed circuit system set off the alarm when they open a circuit.

C. Locations of the installed parts.

1. Manual break-glass stations are located in passageways.

2. Key-test stations are located in passageways, generally near manual stations.

3. Thermostats are located in public spaces.

4. Show group each of the above at nearest location, demonstrating operation and precautions.

D. Demonstrate the detecting circuit.

1. Main control panel.

2. Power supply to detecting circuit---normal if ship' power and emergency is off batteries.

VI. TEST AND APPLICATION.

A. Quiz. Use these and additional questions as an oral quiz.

1. Q. What are the main parts in a typical fire detecting circuit?

A. Manual break-glass alarm stations, key-test stations, thermostats, and master control panel and alarms.

2. Q. Where is the master control panel usually located?

A. On the bridge.

3. Q. How often do USCG regulations require testing of zonit circuits?

A. Once every three months.

4. Q. Is the white light on the main panel normally OFF or ON?

A. On.

5. Q. Where does the fire alarm ring?

A. On the bridge, in the engine room, and usually also in the crew quarters.

6. Q. What is the source of power for operation of the system?

A. The normal ship's supply and emergency batteries.

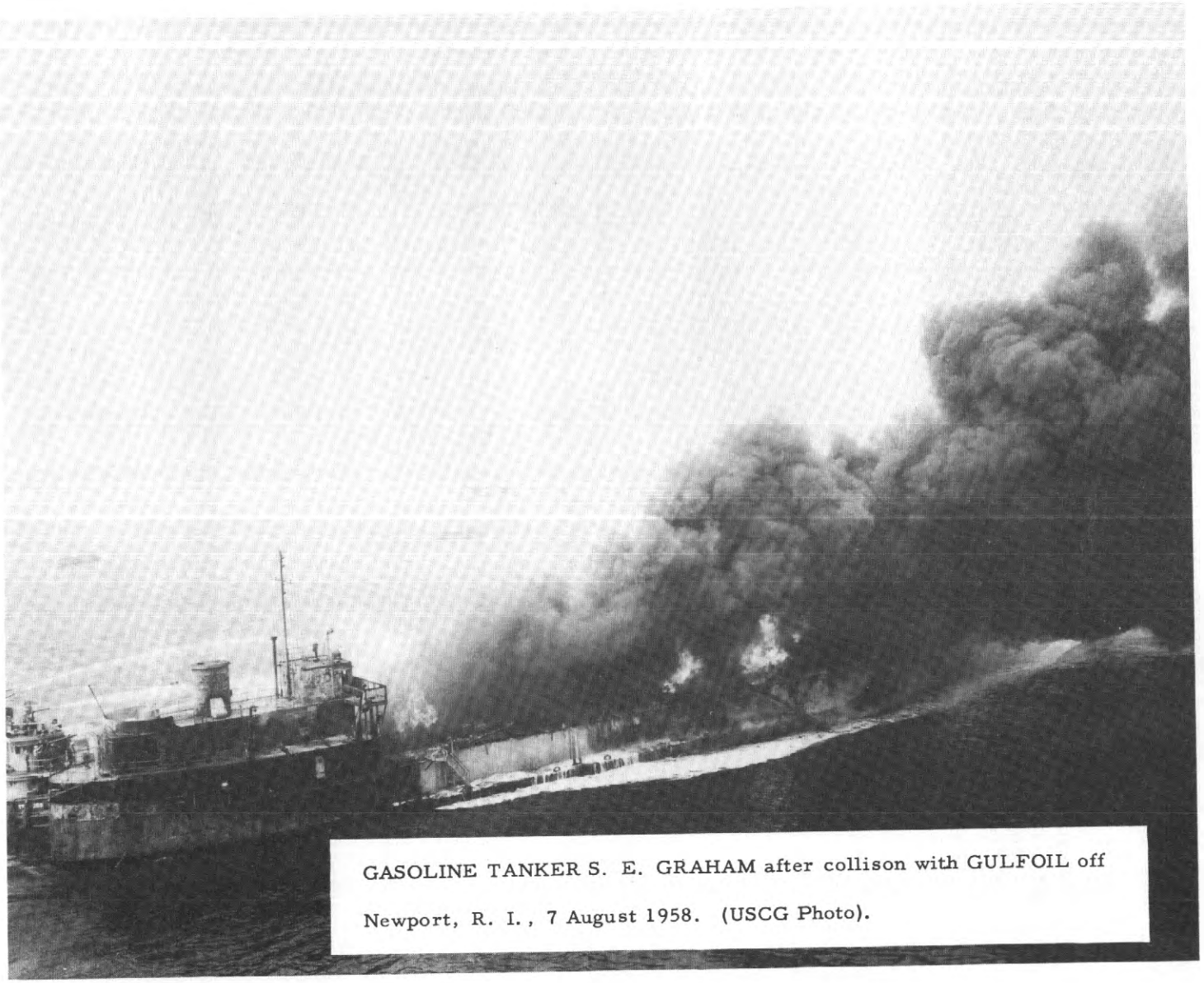
7. Q. Does a rise in temperature cause the bimetallic parts in the thermostat to open or close?

A. Open. Any open circuit sets off the alarm. The circuits are normally closed.

8. Q. How would you turn in an alarm by means of the manual break-glass system.

A. Standing to one side of the box, break the glass with the attached hammer. This releases the plunger and sounds the alarm at the control panel.

B. Application. Take the group to a manual break-glass station and demonstrate how the breaking (removal) of the glass releases the plunger and sounds the alarm. Show the use of key test stations to check circuits. Point out overhead thermostats and explain how they set off the alarm in the open, activated, position. Then show the group the master control panel on the bridge, how the alarm sounds and how the fire detection zone from which the alarm originated is identified.



GASOLINE TANKER S. E. GRAHAM after collison with GULFOIL off Newport, R. I., 7 August 1958. (USCG Photo).

CHAPTER 2

BASIC DAMAGE CONTROL - For All Hands (Lesson Plan)

Section 2.10

CONFINEMENT OF FIRE

I. OBJECTIVES.

A. To stress the importance of confining fire by citing examples of ships lost.

B. To acquaint all-hands with procedures in reporting fires.

C. To explain procedures for confinement of fire.

D. To present the techniques and precautions to be observed in confining fires.

II. MATERIAL.

A. Reference: BUSHIPS Manual, Chapter 93, (See 93-304, 93-505) "Firefighting---Ship". CH-3

B. Training MV 2931 & 80 D.C. Shipboard fire fighting (Basic) & Aircraft carrier (15 min)

III. INTRODUCTION.

A. Introduce self and subject (Confinement of Fire).

B. Arouse interest by citing examples of ships lost due to:

1. Lack of firefighting organization.

ZONE AREA COMDR.
INVESTIGATING

2. Lack of adequate training of crews.

3. Equipment in need of maintenance.

4. Lack of leadership.

5. Failure to confine fire.

C. Examples of total loss of ships by fire:

	Ship	Country	Tons	Year
a.	Morro Castle	U. S.	15,000	1934
b.	Connolly	U. S.	7,676	1948
c.	Noronic	Canada	6,905	1949
d.	Empire Windrush	British	14,561	1954
e.	Salem Maritime	U. S.	10,461	1956
f.	Mission San Francisco	U. S.	10,000	1957
g.	Skaubryn	Norwegian	9,786	1958

h. Other ships drawn from the instructor's or the group's experience. Some will be found in chapter 7.

IV. PRESENTATION.

A. Procedure. Stress the importance of the following steps in confining a fire:

1. Securing watertight and firescreen doors.

2. Securing ventilation in areas affected.

3. Alerting ship by reporting immediately and properly.

4. Investigating thoroughly.

5. Removing flammables from surrounding areas.

6. Confining the fire within bounds.

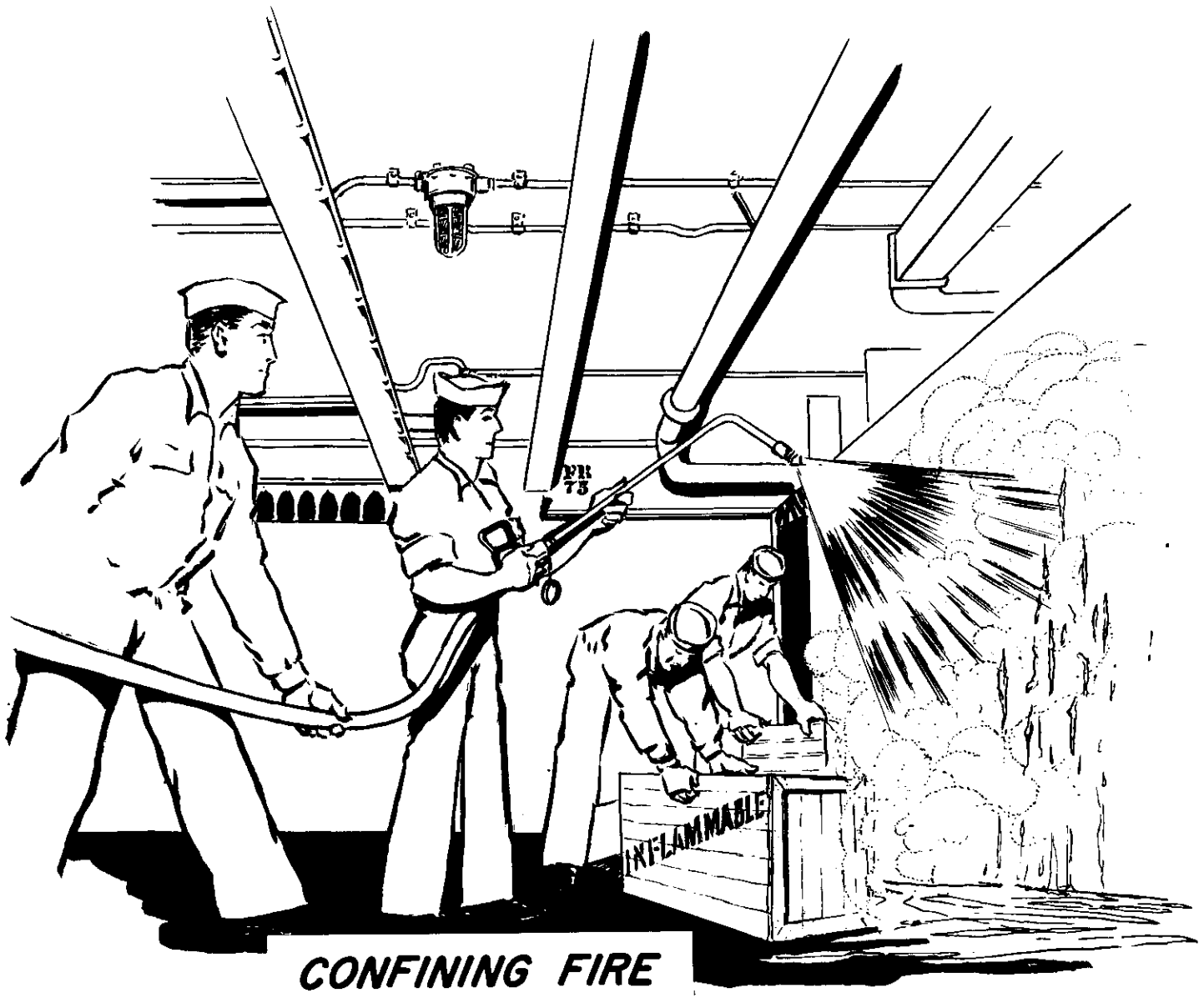
7. Cooling of surrounding areas.

8. If necessary, setting up of secondary boundaries.

B. Discovery of Fire.

1. Alert the ship by reporting the fire immediately to the bridge.

a. Break glass at nearest manual fire alarm station (if so equipped).



CONFINING FIRE

b. If reporting by telephone or messenger, report the location giving deck, frame and side numbers.

2. Investigate thoroughly to determine the type and extent of the fire and to check for personnel casualties. If the fire is a small one, extinguish it immediately without taking extensive measures to keep the fire from spreading.

3. Make necessary closures to confine the fire to the immediate area.

4. Lead out fire hose and cool down heated surfaces.

C. Prevent Spread of Fire.

1. De-energize the following:

a. Ventilation system - close manual fire dampers and check fusible link fire dampers.

b. Electric power serving compartment on fire.

c. Magnetic holders for fire screen doors.

2. Close all fire screen and watertight doors.

3. Remove all flammables from primary fire boundary, i.e., from surrounding bulkheads, decks and overheads.

4. Rig extra fire hose and cool down surrounding bulkheads, the overhead of the compartment below, and the deck of the compartment above (particularly cool the deck of the compartment above, since heat rises).

V. SUMMARY.

A. Procedure upon Discovery of Fire.

1. Alert ship by reporting:

a. Break glass at nearest fire alarm station.

b. Report by telephone or messenger.

B. Action to Confine Fire:

1. Close watertight and firescreen doors.

2. Secure ventilation.

3. Remove flammables from surrounding areas.

4. Rig hose and cool down surrounding bulkheads, deck of compartment above, and overhead of compartment below.

VI. TEST AND APPLICATION.

A. Use these and additional questions as an oral quiz:

1. Q. What steps would you take in confining a fire?
A. Make closures, de-energize electrical circuits, cool off surrounding bulkheads and decks, and remove flammables from adjacent bulkheads.

2. Q. What would you do to prevent spread of fire through ventilation ducts?
A. Secure ventilation and close manual fire dampers. Check fusible link dampers for automatic closing.

3. Q. Why must a fire be confined?
A. To prevent its spread to other compartments and to slow its development within the burning compartment.

4. Q. What should you do first upon discovery of a fire?
A. Report it to the bridge so that the crew can be alerted.

5. Q. Why must flammables be removed from surrounding bulkheads?
A. To prevent ignition from overheated bulkheads surrounding the fire and from emission of hot gases through ducts.

6. Q. Why is it particularly important to cool the deck above a fire?
A. Heat rises and therefore the deck above is the hottest and most critical area.

7. Q. How does de-energizing circuits contribute to confinement of a fire?
A. The burning away of electrical insulation exposes additional ignition hazards.

B. Application. Check application by having individuals explain or demonstrate any of the following:

a. When and how to make a report upon discovering various types and sizes of fires.

b. How to investigate the areas surrounding a large fire.

c. How to prevent the spread of fire by removal of flammables from surrounding area.

d. How to cool the surrounding areas.

CHAPTER 2

BASIC DAMAGE CONTROL - For All Hands (Lesson Plan)

Section 2.11

ORGANIZATION OF SHIPBOARD REPAIR PARTIES

I. OBJECTIVES.

A. To detail responsibilities of the repair parties.

B. To outline the organization of a repair party.

C. To stress the importance of a thorough knowledge of the ship by all repair party members.

D. To stress the necessity for specific organization for each type of casualty.

II. MATERIAL.

A. Training Aids.

1. COMSTS Standard Station Bill for ship's class.

2. Repair locker inventory check-off list.

3. Repair locker muster list.

4. Film MN-4920-D-2, Damage Control-Investigation of Damage, 16 minutes(1961) ch#3

B. References.

1. Standard MSTS Damage Control Bill, section 1.1.

2. BUSHIPS Manual Chapter 88, Section II, Par. 849-852, Organization of Repair Parties.

3. BUSHIPS Manual, Chapter 93, Firefighting-Ship.

III. INTRODUCTION.

A. Introduce self and subject. (Organization of Shipboard Repair Parties).

B. Arouse interest by questioning crew members as follows:

1. What are your assigned duties in the repair party?

2. Where are the duty assignments posted?

3. What damage control equipment is initially taken to the casualty scene?

4. Who takes over in the event that the officer-in-charge of the repair party is incapacitated?

C. Stress importance of:

1. A repair party well organized and trained to cope with any emergency.

2. Repair officer leadership to coordinate action of local zone area personnel with repair party action.

3. Thorough knowledge of assigned duties as posted on the check list in repair locker and of how to perform them.

4. Knowledge of the functions and use of damage control equipment and of its proper maintenance.

5. Ability of each member to perform any of the required duties.

IV. PRESENTATION.-- Organization of Shipboard Repair Parties.

A. Responsibilities of Shipboard Repair Parties.

1. Repair party personnel must know their ship to enable them to effectively:

a. Combat major fires.

b. Unwater flooded compartments.

c. Prevent progressive flooding.

d. Shore bulkheads, etc.

e. Prepare for ABC defense.

2. Repair party members are assigned in accordance with the ship's standard station bill. More detailed assignments are made by the officer-in-charge of the repair party. These are posted in the repair locker and also are listed on crew members' bunk cards.

B. Organization of a Repair Party.

1. Chain of command.

a. Officer-in-charge of repair party is under the damage control officer (first officer).

b. He is assigned in the ships' standard station bill and is responsible for detailed individual assignments and posting of same in the repair locker. Where not specifically assigned in the station bill, the officer-in-charge will designate a second-in-command to take over in the event of his absence or disablement.

2. Organization details.

a. The officer-in-charge of the repair party is responsible for thoroughly training all his men and qualifying them to operate all assigned equipment, in the event that all personnel assigned to his party do not respond for any reason in time of an emergency.

b. Repair party members must be organized into details for all special emergencies, such as, fire, collision, flooding, shoring, etc.

c. Repair party detail responding to an order from the damage control officer such as, "Repair 1, investigate area of (deck, frame and side number) and report findings", will generally proceed as follows:

(1) Repair party officer is in overall charge.

(2) Hose men carry spare hoses to the scene, rig and man hoses and carry out orders.

(3) OBA men carry two OBA's to the scene; OBA's are donned and activated. OBA men stand ready to enter the fire or smoke area and to conduct initial investigation.

(4) Lifeline tenders carry lifelines, spare canisters, flame safety lamp, battle lantern and asbestos gloves for the OBA men.

(5) Telephone talker plugs his telephone head-set into the nearest jack box, tests its connection and runs its lead to the scene ready to transmit reports and to receive orders.

(6) Electrician carries equipped electrical tool belt to the scene and on arrival secures the power and lighting circuits and ventilation systems in the area. He stands by to repair circuits, to connect electric pumps, etc.

(7) Portable CO2 men carry 15 lb. CO2 extinguishers from the repair locker and stand by for further orders.

(8) Other associated equipment, such as portable pumps, portable burning outfit and heavy tools will not be carried to the scene during initial investigation but will be brought later on order as needed.

(9) In case OBA's are needed to enter and work in a burning compartment, the OBA men will relieve the nozzlemen on fire hose.

(10) If an asbestos suit is used, precautions regarding wetting the man in the suit must be carefully observed. (Wetting an asbestos suit in a hot area will generate steam in the suit which may injure the wearer.)

d. Line tenders and OBA men must be familiar with and checked out on lifeline signals as follows:

(1) From OBA men to tender (recommended).

1 pull - "I am all right".
2 pulls - "Lower" or "Give me slack".
3 pulls - "I am coming up".
4 pulls - "Haul me up".

(2) From tender to OBA man (recommended).

1 pull - "Are you alright"?
2 pulls - "Go down (on) till I stop you".
3 pulls - "Stand by to come up (out)".
4 pulls - "Come up (out)".

e. Ventilation detail (zone area personnel).

(1) Close all hatches, doors, ports and vents as listed on zone area check-off lists.

(2) At least two men must be qualified to start and

stop blowers when so directed.

(3) Warn of the possibility of fumes if an electrical blower is used.

f. Telephone talkers man sound-powered phone circuit.

(1) At damage control central.

(2) With repair party at scene.

(3) In zone areas.

(4) Messenger detail must be ready to run messages if phones fail.

g. Miscellaneous details (in accordance with repair party organization plan).

(1) The electrical detail will open or close circuits when and if required.

(2) Start blowers when so directed.

(3) Hook up portable electric submersible pumps.

3. Training.

a. In addition to, or in conjunction with, regularly held drills the repair party officer must conduct training:

(1) To qualify all his men to handle all equipment in the repair locker.

(2) To set up primary and secondary boundaries while investigating damage, including investigation of surrounding areas above and below location of damage.

(3) To make a proper investigation and properly report location, extent and type of damage sustained, personnel casualties, etc.

(4) To fully utilize locally installed equipment - fire stations, portable extinguishers, independent CO_2 systems, etc.

(5) To evacuate personnel casualties from damaged areas so that others render first-aid treatment and provide for further evacuation to sick bay.

(6) To use and understand correct damage control terminology in making reports.

b. The repair party officer should recommend to the first officer those members of his party who require shoreside training during in-port periods.

C. Initial Procedures of Repair Party.

1. Investigation.

a. The repair party officer goes to the scene with OBA men, line tenders and a telephone talker. He details other men under supervision of the second-in-command to investigate surrounding areas above and below.

b. The repair party officer must be thoroughly indoctrinated in all damage control procedures but especially in:

(1) Preventing the spread of fire (BUSHIPS Manual, Chapter 93-505).

(2) Application of water and water-fog (BUSHIPS Manual, Chapter 93-506).

(3) Application of foam (BUSHIPS Manual, Chapter 93-508).

(4) Application of CO_2 (BUSHIPS Manual, Chapter 93-510).

c. When the OBA man completes his initial investigation, the repair party officer will report to damage control central via the damage control sound-powered phone circuit.

(1) The type of fire (rubbish, oil or electrical).

(2) Its exact location (compartment number).

(3) The extent of damage and initial action being taken to control and combat it.

d. Hosemen will lead out fire hose (if not already led out by zone area personnel), and will connect up extra hose lengths. To fight fire below decks from topside, use $2\frac{1}{2}$" hose with "wye" gate and two $1\frac{1}{2}$" hoses.

e. OBA men and tenders.

(1) Have equipment ready for use.

(2) Tenders supply safety line and spare canisters.

(3) Take flame safety lamp below decks and hang it in a conspicuous place---or lower it on a line from topside if convenient--(lower it slowly).

f. Repair party personnel patrol surrounding area, checking thoroughly for signs of damage and reporting conditions.

g. Fight fire according to type and conditions, reporting progress frequently.

h. When fire is out, ventilate, remove charred materials and station flare-up watch to guard against reflash.

i. Repair party personnel must be familiar with their ship's unwatering systems and equipment.

(1) The ships' main bilge system and pumps comprise the primary unwatering system. This includes an installed electric submersible pump which will operate in event of engine room flooding.

(2) Portable pumping equipment, including eductors and portable electric submersible pumps.

(3) Bucket brigades may be used as a last resort.

V. SUMMARY.

A. Responsibilities. Responsibilities of shipboard repair parties and the individual repair party members are spelled out in the MSTS damage control bill, in the ship's station bill and in assignments posted in the repair locker.

1. All members must know the ship to enable them to carry out their emergency duties effectively.

2. Men are assigned to a repair party in the standard station bill and to more specific duties by the officer-in-charge of the repair party. A list of specific duty assignments is posted in the repair locker.

B. Organization of the Repair Party.

1. A chain of command is designated to succeed the officer-in-charge.

2. The officer-in-charge appoints a second-in-command if not designated in the station bill (normally this is the bosun, if an officer is not assigned).

C. Organization Details.

1. All repair party members are to be trained to operate

all equipment in the repair locker. This is in the event certain members do not respond to the alarm for any reason.

2. Men are organized into details to handle any casualty.

3. The initial detail responds with basic equipment brought to the scene by each man.

4. Heavy, bulky equipment is not brought to the scene initially but items are brought on order when needed.

5. Safety precautions:

a. In case of fumes or lack of oxygen, OBA men take over hoses from nozzlemen.

b. Exercise care not to wet the man in the asbestos suit when it is used.

6. Signals to be used between OBA men and tenders must be known and practiced.

7. Ventilation details are handled by zone area personnel under direction of the repair party officer.

8. Telephone talkers:

a. Man phones at fixed stations.

b. Repair party talker plugs in at nearest jack box, and runs lead to the scene.

c. Messengers are used if phones fail.

9. Miscellaneous details are in accordance with the repair party organization plan to handle electrical, ventilation and pumping requirements.

D. Training. Training is conducted in addition to or in conjunction with regular drills:

1. To qualify all repair party members to operate all repair party equipment.

2. To set primary and secondary boundaries in all casualties and prevent spread of damage.

3. To assure proper investigation and reporting of location, extent and type of casualty.

4. To assure utilization of locally-installed fixed equipment.

5. To provide for the evacuation of personnel casualties from the damaged area and turning them over to zone area personnel for first-aid and for further evacuation.

6. To familiarize all-hands with the use of correct nomenclature and damage control terminology.

7. To recommend to the first officer personnel to be sent to shore training facilities.

E. Procedure. Initial procedure on sounding of emergency alarm.

1. Team proceeds from repair locker to scene.

a. Investigates actual casualty scene.

b. Investigates surrounding area - all sides, above and below.

c. Provides information reports to repair officer.

d. Repair officer reports to damage control central:

(1) Conditions, exact location, extent and type of damage

(2) Immediate measures being taken to control and eliminate damage.

(3) Frequent additional progress reports.

(4) When action has been completed (fire out, shoring completed, compartment pumped dry, etc.).

(5) Posting of flare-up or security watch.

(6) When requesting permission to secure gear.

2. Specific topics repair officer should know thoroughly.

a. Prevention of spread of fire.

b. Application of water and water-fog.

c. Application of foam.

d. Application of CO_2.

3. Action and procedure by individual team members:

a. OBA men and tenders.

b. Hose teams.

c. Personnel designated to investigate surrounding area.

d. Electrician.

e. Shoring team.

f. Ventilation detail.

g. Unwatering and drainage.

VI. TEST AND APPLICATION.

A. Test. Use these and additional questions as an oral quiz.

1. Q. How many repair parties are there in any one ship?
A. Cargo ships and C1MAV1 passenger ships have one repair party, other passenger ships and C-4 freighters have two repair parties.

2. Q. What is the purpose of the flame safety lamp?
A. It indicates safe or deficient oxygen content of the air in a compartment and will also indicate combustible or explosive mixtures of gas.

3. Q. How many hose men are in a repair party?
A. The number of hose men depends upon the size of ship and number of personnel available.

4. Q. Why is a "wye" gate used?
A. A "wye" gate is used to reduce the size of hose and increase the number of hoses (usually from one $2\frac{1}{2}$" hose to two $1\frac{1}{2}$" hoses).

5. Q. Name some safety devices and equipment.
A. OBA, asbestos suit and gloves, flame safety lamp, lifeline.

6. Q. Why is it necessary for OBA men and tenders to fully know and understand pull signals on the lifeline?
A. These signals are essential for communication with each other during investigation, rescue operations, fire fighting, etc. The OBA man's life may depend on them.

7. Q. What precaution should be taken by the communication detail against failure of telephones?
A. Have a messenger available to carry messages if necessary.

8. Q. Where can a new man find his repair party duties?

A. They are posted in the repair locker and are listed on his emergency assignments berth card. The station bill also lists assignments to repair parties.

9. Q. What training on equipment should be given individual repair party members?

A. Repair party members should be trained to operate all repair party equipment so they can replace men who may be absent or become casualties.

10. Q. What is the responsibility of the repair party officer with regard to training of his men?

A. He is responsible for training all his men to operate all emergency equipment under any conditions.

B. Application. Discuss equipment needed and plan of action by repair party in various casualties. Then, operating from the damage control locker assume a casualty at a certain location. Have the men pick up required portable equipment, and take all required initial action.

CHAPTER 2

BASIC DAMAGE CONTROL - For All Hands (Lesson Plan)

Section 2.12

ZONE AREA ORGANIZATION

I	Objectives	IV	Presentation
II	Material	V	Summary
III	Introduction	VI	Test and Application

I. OBJECTIVES.

A. To convince zone area personnel that damage control is an all-hands responsibility.

B. To stress the importance of zone area organization in maintaining watertight integrity of the ship and in reporting and handling emergencies.

C. To familiarize zone area personnel with their specific duties and responsibilities.

II. MATERIAL.

A. Training Aids.

1. MSTS training aid chart, "Know Your Ship", 12ND-P1711.

2. Standard Station Bill for type ship.

3. Damage control display plans.

B. References.

1. COMSTS INSTRUCTION 3120.2B, (or latest revision) sections

D C OFFICER
PLOTS REPORTS

18 and 19.

2. MSTS Damage Control Bill, section 1.1.

3. USCG Regulations CG-256, parts 72 and 73.

4. USCG Regulations, CG-257, subpart 90.01.

5. NAVMED P-5056, Syllabus of Lesson Plans for Teaching First Aid, etc.----.

C. Check Lists.

1. Muster list of zone area personnel showing position code number, rating and duties of each assigned man.

2. Lists of fire stations, portable fire extinguishers, water-tight doors, fume-tight doors, fire screen doors, manual fire dampers, vents, remote controls, fire alarm (manual, fire alarm (thermostatic), nearest telephone, and other fittings to be tended.

III. INTRODUCTION.

A. Introduce self and subject - (Zone Area Organization).

B. Objectives of Shipboard Damage Control.

1. To prevent damage before it occurs.

2. To minimize, localize and control damage that does occur - particularly by early reporting of and coping with fire.

3. To accomplish emergency repairs as quickly as possible to permit continued operation of the ship.

4. To protect personnel in emergencies.

C. Role of Zone Area Personnel. Zone area personnel take an active part in preventing and controlling damage, in protecting personnel, and in assisting repair parties make emergency repairs. For example: a sideport or a WT door not properly secured may result in flooding of the ship; what is done immediately to extinguish a fire when first discovered is very important; and passengers rely on you to alert and direct them in emergencies.

IV. PRESENTATION - Zone Area Organization.

A. Outline of Zone Area Organization.

1. Explain zone area relationship to damage control central

under the first officer on the bridge.

2. The ship is divided into zones according to the ship's station bill. Boundaries are MVZBs, main vertical zone bulkheads.

3. The zone area officer is responsible to and under the damage control officer, or the repair party officer if the casualty is in the zone area officer's zone.

4. The assistant zone area officer is responsible to his zone area officer. He assumes command if the zone area officer is not present.

5. Area patrol personnel are generally primarily steward department personnel assigned to specific patrol areas and duties.

6. The zone area organization is based on the two conditions of readiness established for MSTS civil-service-manned ships:

a. Emergency ("Buttoned-Up"). "Emergency" condition is set when all-hands are called to emergency stations (when the general alarm is sounded) or at any time danger to the ship is imminent.

b. Cruising. "Cruising" condition is set before getting underway, before and while entering or departing port. Setting this condition is particularly important when the ship is in confined or inland waters, in heavy traffic, heavy weather, low visibility, or in a combat zone.

B. Duties of a Zone Area Officer. Zone area officers will:

1. Organize and train zone area personnel in their emergency duties.

2. Assure reporting of zone area personnel to their emergency stations when the general alarm is sounded.

3. Report to the bridge (damage control central) when their zones are manned and ready.

4. Report to the bridge the location and scope of initial and secondary damage reported to them.

5. Direct zone area personnel to handle small fires and other minor casualties as they have been trained to do.

6. Assist repair parties as directed by the damage control officer or repair party officer.

7. Furnish men to serve as stretcher bearers if required.

8. Direct the arousing and evacuation of passengers.

9. Maintain communication with the bridge, making progress reports periodically.

10. Report any equipment deficiencies in their zone areas to the damage control officer.

C. Duties of Assistant Zone Area Officers. Assistant zone area officers will:

1. Assist in organizing and training zone area personnel.

2. Make rounds to assure that all posts in the muster list are covered and all men know their assigned duties. He reports absentees to the zone area officer.

3. Readjust patrol assignments to cover duties of absentees so that all areas in the zone are patrolled.

4. Assure that all men know the locations of the nearest fire detecting alarm station, portable fire extinguishers, fire stations, and their "button-up" assignments.

5. Relay all reports to the zone area officer.

6. Assure that the watertight integrity of the zone is not breached.

7. Take initial charge at the scene of the casualty and direct appropriate counter-measures until the repair party officer arrives. Initial action may include:

a. Use of portable fire extinguishers.

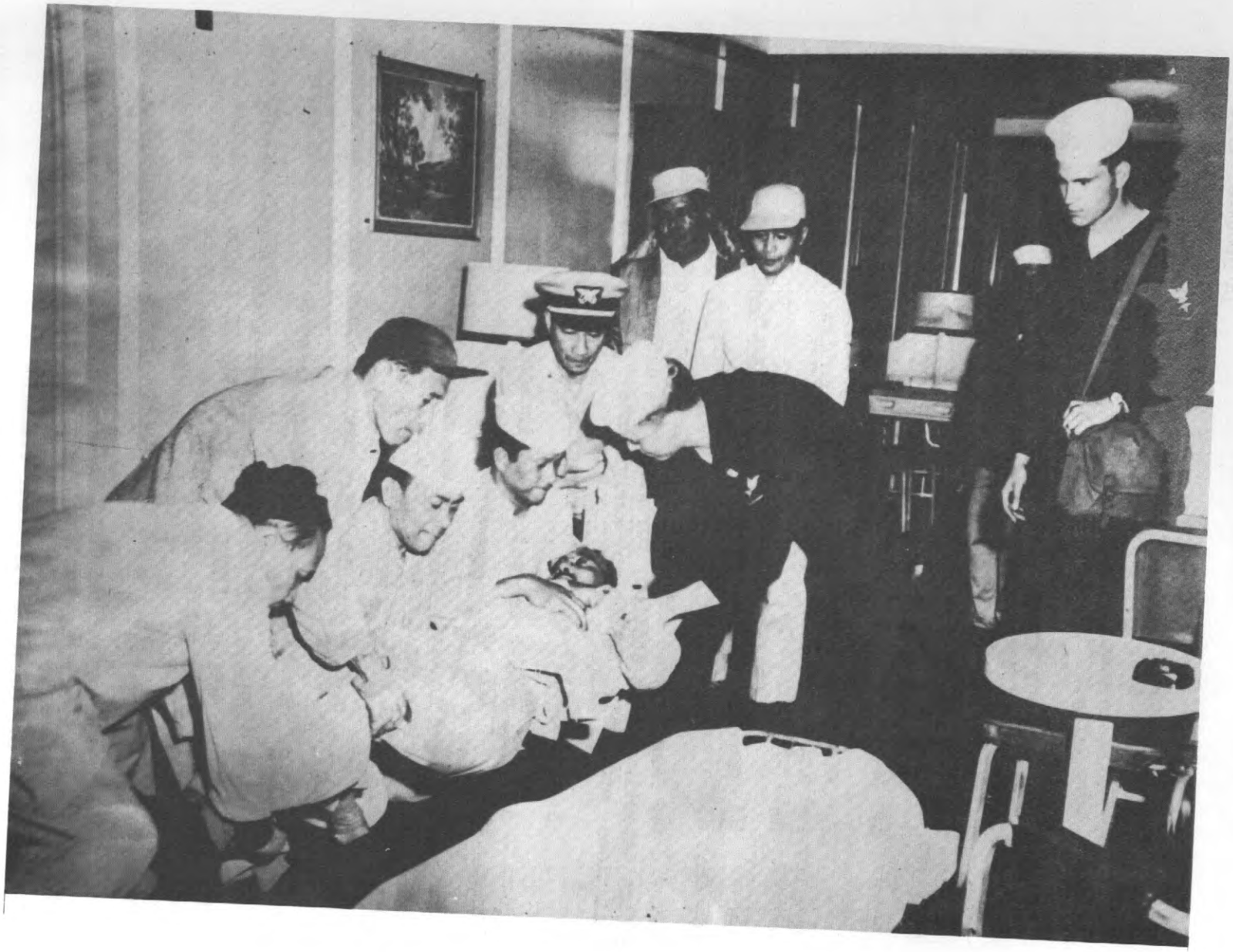
b. Breaking out and charging hoses for the repair party.

c. Removal of personnel casualties and administering artificial respiration. (NOTE: Refer to NAVMED P-5056, Syllabus of Lesson Plans for First Aid Instructors, for information on the back-pressure-armlift method of artificial respiration (page 18) and information on transportation of the injured (page 73).

8. Supervise furnishing assistance requested by the repair party officer including personnel to:

a. Serve as stretcher bearers.

b. Carry shoring timbers.



c. Set up of secondary boundaries in the event of fire and cool down the deck, surrounding bulkheads, and the overhead.

D. Duties of Zone Area Personnel. Zone area personnel will:

1. Make all required closures of air ports, watertight doors, fire screen doors, accesses, vents, manual fire dampers, blowers, fans, etc.

2. Familiarize themselves with the locations, in their own and neighboring areas, of fire alarm boxes, portable fire extinguishers and fire stations.

3. Learn and practice the four points in investigation of damage. These are: Be thorough, be cautious, report, and repeat. In reporting, know how to correctly give the location, class of fire if known (use descriptive terms, as "oil" fire rather than "class B" fire), and report details regarding the extent of the fire.

4. Know how to break out and charge a fire hose with either fog nozzle or with applicator attached.

5. Be prepared to guide the repair party to the scene of the casualty without breaking watertight integrity.

6. Know how to give artificial respiration and how to transport the personnel casualties properly.

7. Bring shoring timbers to the scene of the casualty, as directed.

8. Assist repair party personnel in rigging pumps and hose for unwatering.

9. Continue to check for secondary damage and to assure that all closures remain closed.

10. Maintain a constant patrol, checking bulkheads and decks adjoining the casualty area.

E. Making Closures.

1. Secure ports properly by tightening all dogs down evenly. This should include deadlights if installed.

2. Manually-operated watertight doors, manholes and scuttles must be dogged down evenly, using all dogs.

3. All doors leading to weather decks must be properly secured.

4. All ventilation blowers and fans must be secured and manual fire dampers and vents must be closed. Emphasize the importance of securing the ventilation system in preventing the spread of contamination in ABC defense.

F. Discovering a Casualty.

1. Investigate thoroughly.

2. Be cautious. Never investigate damage alone. As you leave to report, make all closures behind you.

3. Report:

a. Break glass in nearest manual fire alarm station (for fire only).

b. Report by telephone to the bridge.

c. Pass the word by messenger to the zone area officer.

4. Repeat - as necessary, if your message did not get through.

5. While patrolling your assigned station, watch for:

a. Fire.

b. Smoke or strange fumes.

c. Hot bulkheads, decks or overheads.

d. Water flooding or leaks.

e. Ruptures in piping or cables.

f. Panting or ruptured bulkheads.

g. Utility services not functioning.

h. Unusual sounds.

i. Personnel casualties.

6. Information to report:

a. Kind of casualty. (Avoid use of class A, B, or C in identifying classes of fires. Use descriptive terms such as

rubbish, oil and electrical fires.) Report injured personnel, smoke, flooding and leaks, giving source, if possible.

b. Give location by deck, frame and side number, as "2-79-1".

c. Extent of casualty, as "Confined to paint locker". The more complete the initial report, the quicker proper corrective action can be taken.

7. Difference between primary and secondary damage.

a. Primary damage is damage resulting from the initial cause. A collision can cause primary hull damage.

b. Secondary damage is damage which results from the primary cause. This may be flooding or fire resulting from the primary collision. The flooding and fire may, in turn, make built-in equipment and systems inoperative. Therefore, in casualties, it is important to maintain a continuous patrol of the ship to detect and report secondary damage promptly.

G. Assist as Directed.

1. Be sure that you understand all orders given you. If you don't, ask to have them repeated.

2. If you understand an order but don't know where to find the required tools or material (as where shoring timbers are stored), SAY SO.

3. If, while carrying out an order, you run into difficulties, report back promptly.

4. Don't hesitate to request additional help if you need it.

V. SUMMARY.

A. Review the ship's zone area organization and stress the importance of each man knowing his emergency stations and duties.

B. Explain the two conditions of readiness, emergency and cruising. State when and how each is set, and stress the importance of maintaining watertight integrity. Note also that the ventilation system, if not properly secured, may spread fire or, in ABC attack, may spread contamination.

C. Point out that zone area personnel may be called upon to perform other than their assigned emergency duties such as, first-aid, stretcher bearers, assisting repair parties, etc.

D. Review action of zone area personnel---to report to assigned patrol area, secure all fittings, investigate, report, take initial action and assist as directed.

E. Review the ship's built-in features:

1. Watertight boundaries.

2. Fire screen boundaries.

3. Firemain system.

4. Built-in CO_2 system.

5. Fire-detecting system.

6. Smoke-detecting system.

7. All remote controls.

8. General alarm, PA, and telephone systems.

9. All fire dampers.

F. Make sure that all-hands know the above ship's built-in damage control features. Take the group on a tour to identify and demonstrate the proper method of making closures, investigating, reporting initial action,and to demonstrate the proper handling of personnel casualties.

VI. TEST AND APPLICATION.

A. Use these and additional questions as an oral quiz.

1. Q. What check-off lists should the zone area officer have in his possession at drills and during casualties?

A. A muster list of all personnel assigned to his zone area, listing each man's emergency duties; a list of all fire stations, all portable fire extinguishers, watertight doors, fume-tight doors, fire screen doors, manual fire dampers, vents, remote controls and any other fittings to be tended by his zone area personnel.

2. Q. In case of damage in his area, what is the responsibility of the zone area officer to the officer-in-charge of the repair party?

A. He must assist the officer-in-charge of the repair party, as may be requested, furnish personnel to serve as stretcher bearers and to carry tools and material. He must assist in further investigation and in setting up secondary boundaries.

3. Q. What is the responsibility of the zone area officer in regard to training of assigned personnel in his zone?