CHAPTER ANNEX 2-1

TANKS AND VOIDS
DAMAGE CONTROL REPAIR STATION (DCRS) 5

TANK/ VOID NUMBER	MANHOLE ACCESS LOCATION	SOUNDING TUBE NUMBER	SOUNDING TUBE LOCATION	AIR ESCAPE/ VENT LOCATION
5-204-2-F PORT	2-205-2 2-180-4-L	2-209-2	2-180-4-L	MAIN DECK FR 176
5-206-1-F STBD	5-278-1 5-230-0-E	1-269-2	1-212-0-L	MAIN DECK FR 255
5-308-1-W	3-324-1	3-308-1	5-292-0-E	1-278-1-Q

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CHAPTER 3

COMPARTMENT ISOLATION

301. References

a. NSTM Chapter 555, Shipboard Fire Fighting

302. Required Chapter Annexes

a. 3-1, Compartment Isolation Lists/Kill Cards. Prepare for each major compartment in the DCRS's respective areas of responsibility an isolation list, with copies maintained in DC Central. Each isolation list shall identify all 110V and 440V electrical loads, ventilation, compressed air, fire main, fuel/lube/hydraulic oil systems, chill water and potable water in the compartment. Individual items should be listed in a logical manner for implementation while giving due consideration to the relative importance of the item. A sample is provided. The promulgation of Kill Cards shall adhere to the following priority:

1. Fossil fuel spaces
2. Auxiliary Machinery spaces
3. Primary electrical spaces (load centers, CIC, SWBD, or over 440V, etc.)
4. Spaces protected with installed fire fighting capabilities
5. Galley/Laundry spaces
6. Any space hazardous to the Repair Locker (eg. O2N2, ready use acetylene, etc.)

NOTE: *MAIN SPACES COVERED BY THE MACHINERY SPACE FIRE FIGHTING DOCTRINE (4-5) NEED ONLY BE LISTED IN CHAPTER 4 (FIRE FIGHTING), HOWEVER, THE SPACE MUST BE LISTED IN CHAPTER 3 AND REFERENCE THE LISTING IN CHAPTER 4.*

NOTE: *ELECTRICAL CABLES ONLY PASSING THROUGH THE SPACE DO NOT HAVE TO BE LISTED, EXCEPT FOR BUS TIE CABLES. IN THE EVENT OF A CABLE WAY FIRE CABLES MUST BE TRACED AND ISOLATED.*

NOTE: *COMPARTMENT ISOLATION LISTS SHALL BE FREQUENTLY VERIFIED BY DCRS/DCTT PERSONNEL DURING DAMAGE CONTROL DRILLS.*

303. Compartment Isolation Considerations

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

b. Total isolation of the affected space is ideal but not necessarily required. Each casualty must be evaluated individually. Ref. (a) Para 10.3.8.1

c. When a space is abandoned due to fire, flooding, or other damage, the space should be mechanically and electrically isolated to the greatest extent possible under the circumstances.

d. Fire fighting may start before electrical power is secured.

e. The decision to secure lighting should be made by the scene leader.

CHAPTER ANNEX 3-1

ISOLATION LIST / KILL CARDS
FOR

COMPARTMENT NAME:
COMPARTMENT NUMBER:

ELECTRICAL ISOLATION

EQUIPMENT/SYSTEM	CIRCUIT ID NUM	BREAKER LOCATION(S)
1. LOAD CENTER 11	1S-3P-11	1-2-3-E/1-3-2-E
2. 115V OUTLETS	(3-45-2)-1P-C1P	3-45-2-L

MECHANICAL ISOLATION

VENTILATION	NUMBER	CONTROLLER LOCATION
1. RECIRC	1-2-1	1-2-0-L

PIPING	VALVE SYS NUM	DC NUM	VALVE LOCATION
1. FUEL OIL SUPPLY	FO-1	1-1-1	1-1-0-L
2. LP AIR	LPA-1	1-1-2	1-2-0-L

KILL CARD

Card Number: Compt Number: Name:

Frames: Nearest DCRS: Access Equipt:

Supply Ventilation Control Fan Starter At Dampers At	Hazards Inside Compt
Exhaust Ventilation Control Fan Starter At Damper At	Hazards Outside Compt
Natural Ventilation Damper At	Fire Fighting Equipt Inside Compt Fixed Portable
Electrical Isolation (Notate VITAL)	Fire Fighting Equipt Outside Compt Fixed Portable
Mechanical Isolation (Notate (VITAL)	Desmoking Action Fixed Portable
Communications Inside Outside	Dewatering Action Fixed Portable
Boundaries (Watertight)	Boundaries (Fumetight)

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CHAPTER 4

FIRE FIGHTING

401. References

(a) NWP 3-20.31, Surface Ship Survivability
(b) NSTM Chapter 555, Shipboard Fire Fighting
(c) NSTM Chapter 079, Volume II, Practical Damage Control
(d) Hazardous Material Information System (HMIS)
(e) OPNAVINST 5100.19(Series), Navy Occupational Safety and Health Program Manual for Forces Afloat (NAVOSH)
(f) Ship's Damage Control Book
(g) NAVAIR 00-80R-14 NATOPS U.S. Navy Aircraft Fire Fighting and Rescue Manual

402. Required Chapter Annexes

a. 4-1, Fire Fighting Methods. The fire fighting agents for each class of fire are listed in preferential order in Chapter Annex 4-1.

b. 4-2, Repair Party Leader's (RPL) Fire Fighting Checklist. A sample format is enclosed. This checklist must be tailored by each ship to be used by the DCA, RPL, On Scene Leader and bridge/quarterdeck personnel.

c. 4-3, Compartment Hazards. According to references (d) and (e), each Damage Control Repair Station (DCRS) shall have for all spaces a listing of all hazards to include, but not limited to, hazardous material, flammable liquids, ammunition/pyrotechnics, industrial chemicals, industrial gases and any other items the repair party may be concerned with. They may be segregated by DCRS areas of responsibilities.

d. 4-4, Magazine Sprinkler Control Valves. Using reference (f), Damage Control Repair Stations will list by location all magazine sprinkler root/control valves in their area. Sample format provided.

e. 4-5, Considerations for a Major Fuel/Lube Oil Leak and Class "B" Fire in the Main Space

f. 4-6, Sample Machinery Space Fire Fighting Doctrine Checklist for CV/CVN. Paragraph 405 instructions apply.

g. 4-7, Halon Flooding System. Using reference (f), Damage Control Repair Stations will list by location all halon actuation stations. They may be segregated by DCRS area of responsibility. Sample format provided.

h. 4-8, Fixed CO2 Flooding Stations. Using reference (f), Damage Control Repair Stations will list by location all fixed CO2 actuation stations. They may be segregated by DCRS area of responsibility.

i. 4-9, Smoke Removal Channels. Using references (a), (b) and (c) develop smoke removal channels, make up air ports and exhaust points for major passageways and spaces.

403. General Shipboard Fire Fighting

a. Every crewmember should be concerned with fire prevention and aware of fire fighting guidance in reference (a) through (c). The major steps involved in shipboard fire fighting are locating the fire, reporting, containing, extinguishing, and restoring from the casualty.

(1) **Locating.** Considerations for locating the fire include knowledge of the ventilation systems and employment of the Firefinder. 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. The NFTI is a great tool for locating the fire source. However, once inside the space, crossing the thermal layer and high temperature can cause a "white out" condition requiring close adherence to procedures outlined in reference (b).

(2) **Reporting.** Personnel must be trained to report the fire/smoke in the following manner: access the ship's emergency number, identify yourself, report class of fire or color of smoke, location (space noun name), and space DC identification (compartment) number if known. If the space is tenable, return to the fire and initiate firefighting actions. If it is untenable, isolate the space, break out fire fighting equipment and stand by in the area to brief the Casualty Response Team. Make sure all personnel in the surrounding area are aware of the fire/smoke.

(3) **Containing.** Lessons learned from shipboard fires have shown how spaces are more vulnerable to vertical fire spread; the topside fire boundary cannot be overemphasized. Fire boundary personnel must be very active in removing all combustibles from adjacent spaces. If the space has false decks, make sure all materials below the false deck are removed or wet down. One inch of water on deck may prevent fire spread even when the temperature of the space below is above 1000 degrees Fahrenheit. Primary fire boundaries shall have hoses flaked out and made ready as appropriate.

(4) **Extinguishing.** Based on the tenability of the space, the Damage Control Organization should consider direct/indirect firefighting using the preferred agents listed in Chapter 4, ANNEX 4-1.

(5) **Restoring.** How fast the casualty is restored is driven by the situation and the extent of the damage. EOSS should be used, where applicable.

404. **Aircraft Fire Fighting.** Reference (a) describes the shipboard organization and responsibilities for aircraft fire fighting. Reference (g), the Aircraft Fire Fighting and Rescue Manual, describes aircraft fire fighting and rescue operating instructions and procedures. The ship's aircraft fire fighting personnel shall be organized and trained according to references (a) and (g) and Chapter 8.

405. **Machinery Space Fire Fighting Doctrine.** The Repair Party Manual Chapter 4. Annex 4-6 establishes the minimum requirements for combating Main Machinery Space Fires.

a. Incorporate Chapter 4, annex pages 4-6-1 through 4-6-31 as part of the MSFD. Some ship classes (depending on the number of machinery spaces in the particular class) will have to make additional copies of certain pages. These pages should be numbered accordingly. Refer to reference (b), paragraph 555-10.3.8 when completing the Isolation List chapter annex page 4-6-25. Dewatering from Outside Space, list valves in the order in which they are to be aligned.

b. Some line items may not be applicable to all ship classes. In these cases, delete, line out or mark "NA" any line item that does not apply to the particular ship class in question.

c. Insert copies of the Main Space Fire Doctrine with completed chapter annex pages into each shipboard copy of the Repair Party Manual. The ship's Damage Control Assistant shall maintain the master copy in the ship's master copy of the Repair Party Manual.

d. Prepare laminated copies of those chapter annex pages which require action by propulsion plant watchstanders and insert into the watchstanders guide (eg., EOCC, etc.)

e. Prepare laminated copies of those chapter annex pages which require action by repair/fire party personnel and keep in damage control repair stations. The chapter annex pages identifies the repair/fire party team members to whom each section applies. Each team member requires copies for only those sections applicable to their duties.

CHAPTER ANNEX 4-1

FIRE FIGHTING METHODS

Combustible Involved	Fire	Extinguishing Agents
Woodwork, bedding, clothing, combustible stores	A	1. Fixed water sprinkling 2. Fire main 3. AFFF 4. PKP 5. CO2 Extinguisher
Paints, spirits, flammable liquid stores	B	1. Halon 1301 2. Fixed CO2 System 3. Foam/AFFF 4. Installed sprinklers 5. Fire main 6. PKP 7. CO2 Extinguisher
Fuel Oil, JP-5, Gasoline	B	1. Fixed F/F System (CO2/Halon) 2. AFFF 3. PKP 4. Water sprinkling system 5. Halon 1211 6. Fire main 7. Jettison
Deep Fat Fryer	B	1. Range Guard Fire Extinguishing System 2. AFFF Portable Extinguisher 3. Simultaneous PKP and Low Velocity Fog
Electrical/Electronic	C	1. De-energize circuit 2. Halon 1301 3. CO2 4. Water, IAW Ch 555-4.8.1, 8.2.2 5. AFFF, PKP
Magnesium alloys	D	1. Jettison into the sea 2. Fire main (Not solid stream) 3. Dry sand - talc - smother
Grenades, napalm	D	1. Dry sodium chloride 2. Stow in kerosene or similar hydrocarbon

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SAMPLE REPAIR PARTY LEADER CHECKLIST FOR SHIPBOARD FIRES

___ FIRE/SMOKE REPORTED COMPARTMENT
___ SECURE TRANSFERRING FUEL
___ RAPID RESPONSE TEAM ___ (COMMS) ___ CKT
___ CHECK FIRE MAIN PRESSURE (ADDITIONAL FIRE PUMPS REQD?)
___ DAMAGE CONTROL REPAIR STATION MANNED/READY (COMMS) CIRCUIT
___ ZEBRA SET TIME
___ INVESTIGATORS OUT (FIREFINDER ISSUED)
___ ORDER FIRE BOUNDARIES (6 SIDES, TOPSIDE CRITICAL)
___ ORDER SMOKE BOUNDARIES (SMOKE CURTAINS, BLANKETS)
___ ORDER ELECTRICAL ISOLATION
___ ORDER MECHANICAL ISOLATION (FLAMMABLE LIQUID PIPING, VENTILATION, etc.)
___ SPACE EVACUATED/CASUALTIES
___ DAMAGE CONTROL CENTRAL (DCC)/COMMAND DUTY OFFICER (CDO) NOTIFIED
___ COMMAND'S MISSION AFFECTED
___ SPACE HAZARDS (CHECK CHAPTER ANNEX 4-3 RPM) HAZMAT?
___ CLASS OF FIRE A ___ B ___ C ___ D ___
(FUEL SOURCE) (SECURE ELECT. PWR)
___ INSTALLED F/F SYSTEM ACTIVATED
___ FIRE FIGHTERS ENSEMBLES (FFE) PRIMARY TEAM
___ STATUS OF VENTILATION
___ STATUS OF HAZARDOUS SPACES NEAR CASUALTY (ANNEX 4-3)
(CHECK DAMAGE CONTROL PLATES COLOR CODE IAW NWP 3-20-31)
(MAGAZINES/FUEL TANKS/CO2/HALON FLOODING/BATTERY LOCKERS/STOREROOMS)
___ OFF SHIP ASSETS REQD/BACKUP FIRE PARTY LOCATION ___
___ INVESTIGATORS REPORT IN AT LEAST EVERY 15 MINUTES. TIME: ___
___ FIRE ___ SMOKE ___ BOUNDARIES SET
___ STATUS OF MECHANICAL ___ ELECTRICAL ___ ISOLATION
___ ACTIVE DE-SMOKING REQUIRED?
___ OBA ACTIVATION TIME
___ ENTER SPACE - DIRECT OR INDIRECT METHOD?
___ FORCIBLE ENTRY REQD? - PECU/PHARS
___ STATUS OF DE-WATERING SPACE (FIRE FIGHTING WATER (FFW) AFFECTING STABILITY? SPACE HIGH OR LOW IN THE SHIP?)
___ FIRE CONTAINED
___ STATUS OF OBA MEN -- COORDINATE RELIEF'S _____ (LOCATION)
___ FIRE OUT

__ **MAJOR FIRE - VITAL SYSTEM RESTORATION - COORDINATE WITH EOOW USING MASTER LITE-OFF CHECK-OFF SHEET**
__ **REFLASH WATCH SET**
__ **OVERHAUL COMPLETE/DEWATERING**
__ **DE-SMOKE (ENSURE SMOKE PATH CLEARS SHIP)**
__ **AFFECTED SPACE GAS FREED BY GFE/GFEA**
__ **REMAN; PROVIDE POST FIRE DAMAGE REPORT**

CHAPTER ANNEX 4-3

COMPARTMENT HAZARDS

SPACE	HAZARDS	REMARKS
		REPAIR 3
AFTER STEERING 6-5-6-0-E	HYDRAULIC OILS	USE AFFF STA 4 WITH INLINE EDUCTOR & 1-1/2" HOSE
ARMORY 2-483-2-Q	AMMUNITION/GRENADES	MAG SPRINKLER--ACT VLV 2-481-12
#2 FLAM LKR 2-524-0-Q	PAINTS/OILS GREASES	PRI-CO2 FLOODING--SEC-#4 AFFF STA
TOWED ARRAY RM 2-506-0-Q	ISOBAR	PRI-HALON FLOODING--SEC#4 AFFF STA
TORPEDO MAGAZINE 1-390-1-M	OTTO II FUEL HE	PRI-MAG SPRINKLER--ACT VLV 1-417-1 SEC-FIRE MAIN--PRI-SCOTT AIR PAC SEC-OBA
LAUNDRY 2-382-0-Q	BLEACH	CORROSIVE - PERSONNEL HAZARD-DO NOT EXPOSE TO AL/CU=H2
JP-5 PUMP ROOM 3-398-0-E	JP-5/AC PLANT--FREON/HCL/ HBR/HFL/PHOSGENE	PRI-AFFF SPRINKLING SEC-F/S 2-418-2 INLINE EDUCTOR
		REPAIR 2
ANCHOR WINDLASS 1-0-0-E	HYDRAULIC OIL	PRI-#1 AFFF STA SEC-FIRE STA # 1-79-1/ELECT. ISO.
CHT PUMP ROOM 5-138-0-E	H2S, METHANE RAW SEWAGE	TOXIC/FLAMMABLE
RADAR ROOM 03-138-1-C	HIGH VOLTAGE	SECURE PWR/CO2
		REPAIR 5
GALLEY 1-260-0-Q	DEEP FAT FRYER	PRI-RANGE GUARD--SEC-4' APPL & PKP/PORTABLE AFFF--ELECT. ISO.
OIL LAB 2-274-2-Q	PETROLEUM CHEMICALS (LIST)	PRI-CO2/PKP SEC-#2 AFFF STA
#1 SK STOREROOM 3-274-0-A	(LIST HAZARDS)	PRI-#2 AFFF STA SEC-FIRE STA # 4-299-1
LOG ROOM 2-260-0-Q	CAUSTIC SODA	PERSONNEL HAZARD-H2 CREATED WITH AL/CU

CHAPTER ANNEX 4-4

MAGAZINE SPRINKLER CONTROL VALVES

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

NOTE: ***UNLESS OTHERWISE SPECIFIED, MAGAZINE SPRINKLER SYSTEMS ARE TO BE ACTIVATED ONLY BY ORDER OF THE COMMANDING OFFICER. THE SHIP'S POLICY MAY BE ADDED TO THIS LIST.***

CHAPTER ANNEX 4-5

CONSIDERATIONS FOR A MAJOR FUEL / LUBE OIL LEAK AND CLASS "B" FIRE IN THE MAIN SPACE

1. Person Discovering the Leak

a. **Report the Leak.** An accurate report of the source, nature and location of the oil leak/spray or fire will allow assistance to be quickly dispatched to correct the casualty and combat any fire. A major leak is any leak which is a steady stream or in which fluid is squirting out of the system. Notify either a nearby watchstander or EOS to call assistance to the scene and allow other watchstanders to take action and quickly isolate the leak (e.g., major JP-5 leak lower level starboard side of #1 Main Machinery Room from the JP-5 manifold).

b. **Deflect the Leak.** Prompt and effective actions can limit the casualty, and in many cases prevent the leak from cascading into a major fire. Persons discovering the leak must deflect the leak with any available material. The goal is to deflect the leak in such a manner that it is directed towards the bilge away from hot surfaces and is in a solid stream form to minimize the chance of fire. Suggested materials are shirts, jackets, rags, gasket material or sheets. If possible secure the source of the leak.

c. **Obtain an EEBD.** Obtain and shoulder an EEBD.

d. **Activate AFFF** bilge sprinkling. Activate the nearest AFFF hose reel and proceed toward the leak. A second watchstander should be available by this time to act as a hoseman. He should keep the hose on top of his shoulder when the nozzle is activated to help direct the nozzle in a downward direction. When near the leak, place the vari-nozzle in a narrow pattern and activate the hose to flush the oil to the bilge and cover it with AFFF. Do not use solid stream or the wide spray pattern.

e. Should a Class Bravo fire start, proper initial actions must be taken in the first two minutes of the fire ignition. Initial actions include:

(1) Report the fire and warn others in the immediate vicinity.

(2) Notify EOS/CCS.

(3) Attempt to contain and extinguish the fire using an AFFF hose and, if readily available, a PKP extinguisher until relieved at the scene or until the fire goes "out of control".

For most Class Bravo fires, the person closest to the fire after reporting it should attempt to combat the fire with portable fire fighting equipment. Other individuals should break out portable PKP and AFFF Hose Reels.

2. Initial Actions by On-Watch Personnel/Emergency Teams

a. The senior person in the space shall take charge and direct fire fighting and source isolation.

b. The Engineering Officer of the Watch (underway) or Load Dispatcher (inport) shall immediately pass the word using the 1MC.

c. Watchstanders in unaffected spaces shall isolate systems and take actions as directed by EOOW/PPWO/RDO/EDO.

d. Set Negative Ventilation in the affected space.

e. The At Sea Fire Party shall additionally provide a hose team dressed out in full fire fighting gear with a hose from outside the affected space. This team is designated as Primary Fire Party, and will relieve initial fire fighting personnel when directed.

f. The Propulsion Plant Casualty Assistance Team/Remanning Team will provide a relief watch team to man the affected space and ensure safety of propulsion plant equipment.

g. The EOOW or DCA shall muster all Reactor Department/Engineering Department personnel to provide an adequate manpower pool for additional fire fighting efforts.

h. Equipment should be secured as much as possible in the affected space. Main engines should be locked, turbine generators, and other major equipment secured, and steam taken out of the space. The fire may affect equipment in the opposite plant.

3. Actions by Emergency Teams:

a. Upon hearing the word for the fire, members of the At Sea Fire Party/Inport Emergency Team/Propulsion Plant Casualty Assistance Team shall proceed to the repair locker specified and begin breaking out fire fighting equipment in preparation for entering the affected space.

b. Fire Marshal/Duty Fire Marshal shall report to the scene and oversee fire fighting actions until properly relieved by the On-Scene Leader, after which the Fire Marshal/Duty Fire Marshal shall proceed to Repair 4/5 and help direct the remainder of the emergency team.

c. The following actions must be accomplished by the Emergency Teams:

(1) Establish communications with Damage Control Central.

(2) Man AFFF Stations and Bilge Sprinkling AFFF Stations. Stand by to transfer AFFF.

(3) Don equipment, including fire fighting ensemble, and when directed light off OBA's. Report light off times to DC Central.

(4) Enter the space and fight the fire. They should relieve watchstanders fighting the fire. (If space not evacuated).

(5) Set fire and smoke boundaries and investigate the surrounding area for secondary fires.

4. Out of Control Class Bravo Fire Actions. A Class Bravo Fire, especially one that has burned for a long period of time or is fed by an unsecurable oil source, can become out of control within seconds. When this happens, operating machinery in the plant should be secured and the space should be evacuated. In addition, when faced with an out of control fire the following guidelines are provided for consideration:

a. The main engines should be locked. If this can not be done then the ship should be slowed so that the shaft(s) will not rotate.

b. Evacuation is the last resort. If at all possible fire fighters want to stay in the space. As long as personnel are in the space the fire can be fought. Once personnel evacuate there is very little chance of re-entry until the fire burns itself out. Once the decision is made by the EOOW, PPWO or Space Supervisor to evacuate the space, all personnel should exit using the nearest safe access. To prevent running the system dry, operate AFFF Bilge Sprinkling for no longer than four minutes. Never operate the system when the concentrate level is not visible in the tank sight glass. Immediate manning of the AFFF Station is essential to expedite tank replenishment. Access doors, hatches, and scuttles should be secured when all personnel are out of the space. At this time, ventilation in the affected space shall be secured. The EOOW and Fire Marshal shall be notified when the following actions have been taken:

(1) Ventilation to the space has been secured.

(2) Halon and AFFF Bilge Sprinkling Systems have been activated where installed.

(3) The space is evacuated and all personnel mustered.

(4) The Space Supervisor has completed briefing the fire party and On-Scene Leader on the location of the fire and plant status.

(5) If the fire is declared "out of control" by the man in charge, the space should be mechanically and electrically isolated. Permission should be obtained from the DCA or Engineering Duty Officer with the Engineering Officer's concurrence before re-entry is attempted.

(6) Isolation of the affected space is necessary to prevent a fire from intensifying due to the addition of flammable liquids or oxygen, and to reduce the electrical hazards. Complete isolation of the space is not required in order to allow fire fighters to re-enter and fight the fire. Immediate isolation shall be IAW Ch. 555-10.3.8.1.

(7) Complete electrical isolation will be very difficult due to the sheer number of cables passing through any given space. To the extent possible, all electrical equipment should be secured from outside the affected space at the ship's service, IC and emergency switchboard, load center, or distribution panel. The switches, circuit breakers and fuses necessary to do this shall be clearly identified by a colored border. In addition, a placard stating the color code shall be posted on affected switchboards, load centers and distribution panels. Complete electrical isolation is not required for fire party entry/re-entry.

5. Space Evacuation. Should the fire go "out of control", requiring the space to be evacuated, take the following actions:

a. Adjust the vari-nozzle stream to the wide angle position to protect yourself and others from the fire's heat. If necessary, don SEED/EEBD to facilitate evacuation.

b. **DO NOT TURN YOUR BACK ON THE FIRE!!** Start backing out of the space toward the nearest exit. This will normally be an escape trunk.

c. Upon reaching the escape trunk, lay your gear down off to the side of the entrance and proceed through the door one at a time until the only man left in the space is the nozzleman. He should then close the bail of the nozzle and back through the door without turning his back to the fire.

d. When in the escape trunk have one person attempt to see through the viewing windows to look for other personnel coming toward the door. Other personnel in the trunk should proceed through the hatch to the second deck. The first person through the hatch remains at the hatch to close it if required. Should the person at the escape trunk door see someone else coming toward the door or feel pressure from someone trying to open it, he should shout, "**CLOSE THE HATCH**". Upon hearing the shout the person at the hatch will shut but not dog the hatch and stand on it. He will continue to do so until told to open the hatch. Once the hatch is shut, the guard at the escape trunk door will allow personnel from the main space into the trunk. **Only the escape trunk door or the hatch, should be opened at any given time.**

e. Proceed in the above fashion until all personnel have exited the escape trunk except for the door guard. He will then shout up to close the hatch and climb the escape trunk ladder. Upon reaching the top, he will bang on the hatch to have it opened. After he has exited, the hatch should be shut and dogged.

f. All personnel who have exited the main space should report to the nearest repair locker for muster and turn over of space conditions to the Repair Locker Officer and On-Scene Leader. Personnel shall remain at the repair locker until directed by the EOOW/PPWO.

g. Activate AFFF Bilge Sprinkling for "XX" minutes when evacuation is ordered.

6. General Quarters

a. If the ship is already at General Quarters when a main space fire occurs, the casualty will be treated as battle damage and handled as such.

b. If the ship is not at General Quarters, the casualty should be handled with personnel on watch, Reactor/Engineering Department personnel and the At Sea Fire Party/Inport Emergency Team. The DCA/EOOW will recommend the ship go to General Quarters, if in their judgement, it will enhance fire fighting efforts.

(1) If inport, the following are available as reinforcements to the Inport Emergency Team:

(a) Rescue and Assistance Detail. (If assigned)

(b) Augmenting personnel from the duty section.

(c) Off-Ship teams: Other ship's R&A Details, base/shipyard fire departments.

(2) In the above cases the DCA, or in his absence the Fire Marshal/Duty Fire Marshal is in overall charge of the fire fighting efforts and the integration of reinforcing/relief personnel.

(3) ACDO is responsible for mustering relief personnel IAW Chapter 1, ANNEX 1-9.

c. If General Quarters is called away, personnel fighting the fire should remain. The transition from fighting a fire from Condition III to Condition I is extremely difficult and complex. The Commanding Officer should establish the procedures for this transition and ensure that all of the ship's training teams train these procedures thoroughly and ensure that they are understood completely by the entire crew.

7. **Desmoking, Atmospheric Testing, Dewatering, and Remanning.** After the fire is out, the space shall be made safe and ready for remanning. A reflash watch shall be posted with AFFF to quickly extinguish any fire which may reignite. The following general guidelines are provided:

a. **Desmoking.** When a Class B Fire has been extinguished, combustible gases may be present. Operating electric controllers to start fans may ignite these gases. Desmoking with the installed ventilation system can proceed with minimal risk when Halon and AFFF bilge sprinkling have been operated, the source of fuel secured, the space allowed to cool, all fuel washed into the bilge's, and no damage sustained to the electrical distribution system. Clearing the space of smoke should commence as soon as the space has cooled sufficiently so there is no danger from re-ignition. Temperatures in the space should be below 140 degrees F. Before it is reported cooled. Circuit breakers and other protective devices, which tripped automatically, shall be left in the tripped position until system damage has been assessed. Examine the electrical distribution system and, if possible, reestablish power to the installed ventilating fans. If fully operational, run all fans on high speed for a minimum of 15 minutes to remove smoke and toxic gases. If the installed system is partially or fully inoperable, desmoking will take longer, but can be accomplished by using portable blowers, operable installed fans, or positive ventilation from adjacent spaces and opening accesses to the affected spaces.

b. **Atmospheric Testing.** Desmoking shall precede atmospheric testing because some combustible gas analyzers will not operate reliably in a Halon rich or oxygen deficient atmosphere. Additionally, oxygen analyzers will not operate reliably if the sensor is exposed to excessive moisture or comes in contact with particulate found in a post-fire atmosphere. When the space is clear of smoke, test for oxygen, combustible gases and toxic gases. NSTM Chapter 074, Vol. 3, Gas Free Engineering, states that the oxygen level shall be between 19.5 and 22 percent, combustible gases shall be less than 10 percent of the lower explosive limit, and all toxic gases below their Permissible Exposure Limits (PEL), before the space may be certified safe for personnel.

c. **Dewatering.** Dewater the space with the Commanding Officer's permission and in accordance with operating procedures.

d. **Remanning.** Once the space is certified as safe, remanning can begin. Operations of equipment and de-isolation of mechanical and electrical systems shall be considered only after a careful assessment of damage.

CHAPTER ANNEX 4-6

SAMPLE MAIN MACHINERY SPACE FIRE FIGHTING DOCTRINE FOR CV/CVN

SAMPLE TO BE TAILORED TO SHIP

1. **Actions in case of a major flammable liquid leak inport or underway**

a. WATCHSTANDER/SPACE SUPERVISOR

Initial actions (in sequence):

___ If auxiliary steaming inport or at anchor, establish plant/repair party control until relieved by the EOOW/EDO.

___ If auxiliary steaming inport or at anchor, inform all engineering spaces and Damage Control Central

___ If underway, report the leak to the EOOW.

___ Secure the source/deflect the leak away from ignition/heat sources and isolate the affected system according to applicable operational procedures.

___ Obtain and shoulder an EEBD.

___ Apply AFFF/flush fire hazard to bilge.

Concurrent actions:

___ Secure operating machinery according to applicable operational procedures.

___ Secure all other heat and ignition sources.

___ Deploy portable PKP extinguishers to the scene of the leak.

___ Vapor secure all bilge surfaces by activating AFFF Bilge Sprinkling System, if installed, for "XX" (__) minutes, or by applying AFFF with a foam hose. (If not determined for ship then 1 minute minimum).

___ Leave space ventilation in operation; set negative ventilation if possible.

___ When ordered, pump the fire hazard over the side.

b. EOOW/CCSW ACTIONS (MAJOR FLAMMABLE LIQUID LEAK).

___ Report leak to OOD.

___ Direct actions according to applicable operational procedures.

___ Order AFFF station manned, as required.

___ Order emergency/standby generator(s) be started before loss of electrical power.

___ Order additional fire pump(s) be placed in operation as required to maintain fire main pressure.

___ Obtain permission to pump fire hazard over the side.

NOTE: *DE-WATERING SHALL BE COMPLETED ACCORDING TO OPNAVINST 5090.1 (Series), ENVIRONMENTAL AND NATURAL RESOURCES PROGRAM MANUAL, AND LOCAL SOPA INSTRUCTIONS.*

c. OOD ACTIONS (MAJOR FLAMMABLE LIQUID LEAK)

___ Establish communications with DC Central.

___ When appropriate, be prepared for loss or reduction in ships maneuverability.

___ Inport, ensure all off-watch personnel and non-IET personnel are mustered.

___ Notify other ships or authorities as appropriate.

___ Be observant for smoke or other signs of fire.

___ Sound General Quarters when directed.

___ Be prepared to maneuver ship to cause smoke to be carried away from ship.