

1. ACN 1/A authorizes the following changes to Naval Ships Technical Manual, S9086-S3-STM-020, Submarine Firefighting, Chapter 555 Volume 2 Revision 9:

a. Page 555-13, paragraph 555-31.6.2: delete existing fourth sentence and replace with; "AFFF is available as portable fire extinguishers, as a fixed system for SSN 21 Class at all 1-1/2 inch seawater fire hose stations, and when installed, at 1-1/2 inch seawater fire hose stations and 3/4 inch seawater hoses equipped with portable AFFF injection units (PAIU)."

b. Page 555-23, paragraph 555-31.11.3.2: Second sentence, replace "will also have" with "has". Insert a new third sentence, "All SSN-774 Class seawater fireplugs and hoses and selected SSBN Class seawater fireplugs (after TZ-0879) have portable AFFF injection units (PAIU) supplying AFFF."

c. Page 555-29, paragraph 555-32.1.5: replace with "To retard the spread of smoke from a fire, smoke stops are installed in frame bays at deck edges in the forward compartment in the SSN 21 class and SSN 774 class. The smoke stop is a fume tight barrier of flexible sheet material installed between the deck edge and the hull. Smoke stops may also be installed at ventilation sound stops. The forward compartment of SSN 774 Class is outfitted with smoke curtains at selected doorways. The design incorporating smoke stops and smoke curtains creates a system of smoke zones to establish primary smoke boundaries in the forward end of the ship during fire casualties. Even with smoke boundaries, an intense fire will easily cause smoke and heat to completely fill a compartment in a short amount of time if the fire is not quickly extinguished."

d. Page 555-30, paragraph 555-32.3.2: Add a new section, "555-32.3.3 FIREMAIN SYSTEM, SSN-774 CLASS. The SSN-774 Class AFFF/seawater (AFFF/SW) system consists of two seawater firemains, one forward and one aft. AFFF/SW is available at all fire hose stations, hose reels, and the diesel overhead sprinkler system. The AFFF is supplied by the PAIU. Seawater flooding is provided in the aft end chlorate candle locker in the engine room, and the small arms ammunition (AMMO) and pyrotechnics (PYRO) lockers located in the forward compartment. Seawater only sprinkling is provided in the lockout trunk (LOT)."

e. Page 555-31, paragraph 555-32.4.3 Change "The B system, installed in the SSN 688, SSBN 726 and SSN 21 classes," to "The B system, installed in the SSN 688, SSBN 726, SSN 21 and SSN 774 classes,"

f. Page 555-31, paragraph 555-32.4.4: Replace first sentence, reading "The basic system consists of a cylinder assembly, discharge piping and nozzles, detector assemblies, a cable release system, a pressure release control box and N2 cartridge, and on the SSN 21 and SSBN 726 classes a remote manual control capability." With "The basic system consists of a cylinder assembly, discharge piping and nozzles, detector assemblies, a cable release system, a pressure release control box and N2 cartridge, and on the SSN 688 (after S/A 4101D), SSN 21, SSBN 726 and SSN 774 classes a remote manual control capability."

g. Page 555-34, paragraph 555-32.4.5.3, last sentence, change "The SSBN 726 class submarines" to "The SSBN 726 and SSN 774 class submarines".

h. Page 555-34, paragraph 555-32.4.6, last sentence, change "SSBN 726 and SSN 21 classes." to "SSBN 726, SSN 21 and SSN 774 classes."

i. Page 555-34, paragraph 555-32.4.6.2, second sentence, Change "SSBN 726 class has" to "SSBN 726 and SSN 774 classes have"

j. Page 555-35, paragraph 555-32.4.6.2.4,

(1) First sentence, change "On the SSBN 726 and SSN 21 class" to "On the SSBN 726, SSN 21 and SSN 774 class"

(2) Add new second sentence "For SSBN 726 class activate by depressing the remote actuator detent button and pushing in the actuator. For SSN 21 and 774 classes, activate remotely by pulling the release pin at the remote manual control box."

k. Page 555-36, Insert two new sections 555-32.7 and 555-32.8 as follows:

#### **"555-32.7 PORTABLE AFFF INJECTION UNIT (PAIU)**

555-32.7.1. GENERAL The portable AFFF injection unit (PAIU) is a three gallon cylinder designed to store and deliver 1% AFFF concentrate to the AFFF/SW system. The PAIU injects AFFF concentrate at quick disconnect tee fittings at each fire station and fire hose reel. To permit continuous operation with AFFF, two PAIUs can be connected to the fire station, and as the first is completely discharged, a second PAIU can be activated to provide AFFF. Additional PAIUs can be passed to the station and connected to replace the discharged cylinders as needed, see figure 555-32-2. The 1% concentrate currently approved for use in the PAIU is manufactured by Ansul Inc. as ANSULITE 1% AFFF Concentrate, and meets the fire performance requirements of Underwriters Laboratories Standard UL-162

(UL Standard for Safety Foam Equipment and Liquid Concentrates). The PAIU is not a stand alone portable fire extinguisher and must be used with a hose station, hose reel, or the diesel sprinkler system to provide properly mixed AFFF foam solution.

555-32.7.2 DESCRIPTION The PAIU consists of the cylinder assembly and hose assembly, see Figure 555-32-2. The three gallon cylinder has a fill cap with relief valve, carrying handle, contents indicator, discharge fitting, and gas pressure cartridge. The CO2 gas pressure cartridge mounted to the extinguisher shell charges the cylinder through a pressure regulating valve. The discharge hose assembly consists of a check valve, flow control valve, hose, plug valve, and quick disconnect fitting. The hose assembly is ten feet in length. The PAIU is filled with 2.5 gallons of 1 percent AFFF concentrate and will discharge in approximately 2 to 2.5 minutes when connected to a fire hose station. The PAIU will provide an extended discharge time of approximately 6 to 8 minutes when connected to a hose reel or the diesel generator sprinkler system due to an additional flow control device in the station piping line.

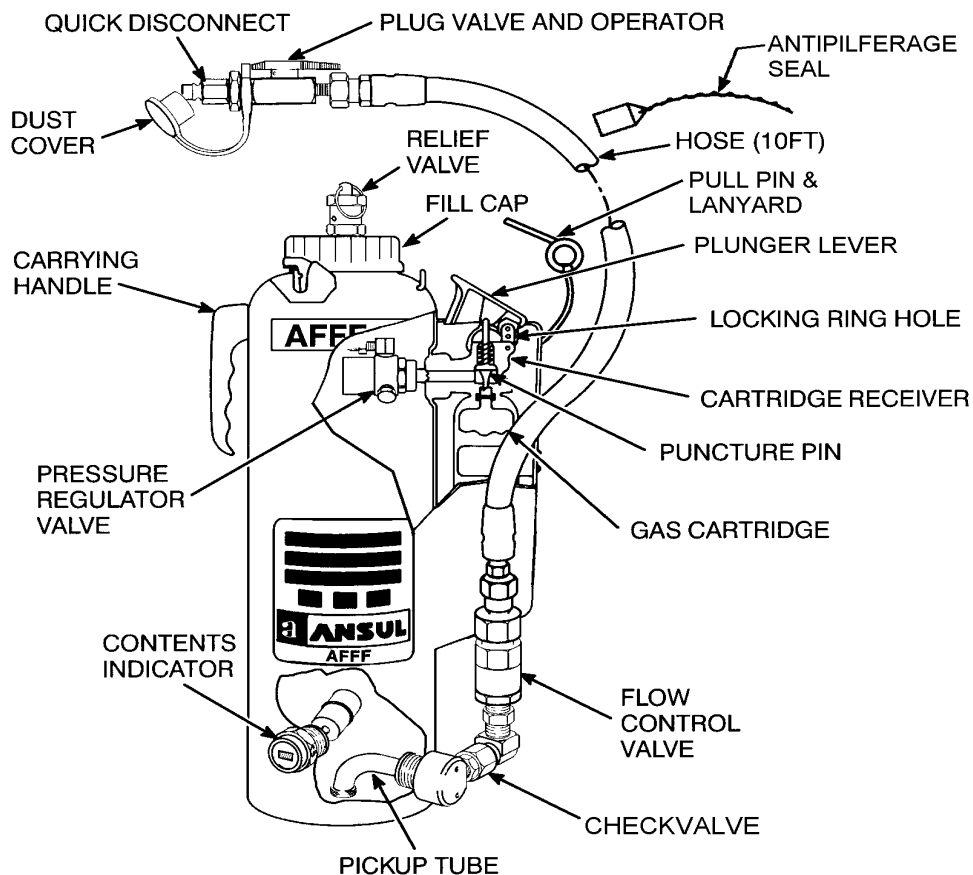
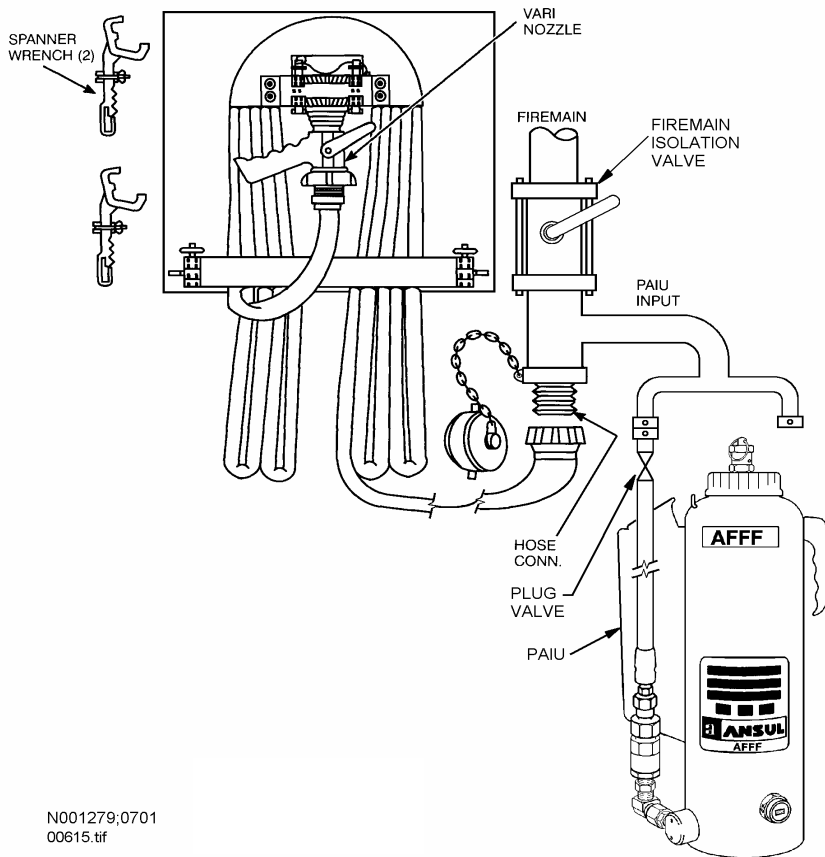


Figure 555-32-2 Portable AFFF Injection Unit (PAIU)



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Figure 555-32-3 Typical Fire Hose Station with PAIU

**555-32.8 DESCRIPTION OF AFFF/SW FIREFIGHTING SYSTEM, SSN-774 CLASS**

555-32.8.1 DESCRIPTION. SSN 774 Class aqueous film forming foam/seawater (AFFF/SW) firefighting system supplies seawater or AFFF/SW solution to each fire hose station, fire hose reel, and the diesel sprinkler. The system supplies seawater only to the Lockout Trunk (LOT) sprinkler to protect ordnance when stowed in the LOT, to the Small Arms Ammunition and Pyrotechnics Locker, and to the aft chlorate candle locker standpipe. AFFF used on VIRGINIA Class is 1% Concentrate (1 part concentrate to 99 parts water). AFFF is stored in portable AFFF injection units (PAIU) located at each fire hose station and hose reel. See Figure 555-32-3 for typical fire hose station with PAIU arrangement."

1. Page 555-36, paragraph 555-32.7, renumber existing paragraph "555-32.7" as "555-32.9"

m. Page 555-36, paragraph 555-32.7.1.

(1) Renumber existing paragraph "555-32.7.1" as "555-32.9.1"

(2) First sentence, change "SSN 21 class" to "SSN 21 and SSN 774 classes"

(3) Third sentence, change "SSN 21 class" to "SSN 21 and SSN 774 classes"

n. Page 555-37, paragraph 555-32.8: renumber existing paragraph "555-32.8" as "555-32.10"

o. Page 555-37, paragraph 555-32.8.1,

(1) Renumber existing paragraph "555-32.8.1" as "555-32.10.1"

(2) First sentence, change "SSBN 726 and SSN 21 class submarines." to "SSBN 726, SSN 21 and SSN 774 class submarines."

(3) Add new sentences to end of paragraph, "On SSN 774 flooding of the forward chlorate candle storage is performed with the nearest available fire hose or hose reel. The aft chlorate candle locker is flooded via a dry standpipe fitting supplied from fire hose connected from fire hose station on engine room lower level."

p. Page 555-37, paragraph 555-32.8.2.

(1) Renumber existing paragraph "555-32.8.2" as "555-32.10.2"

(2) Add new sentence aft the end of paragraph "Submarine chlorate candle lockers on future submarine classes no longer require fixed sprinkler protection unless a nearby fire hazard is identified that due to arrangement, would prevent access to the locker to apply firefighting water. Fire history of incidents involving candles in-use, occurred in the furnace, not the storage locker."

q. Page 555-44, paragraph 555-33.4.1

(1) Fourth sentence, change "(firemain for SSN 21 class)" to "(firemain for SSN 21 and SSN 774 classes)"

(2) Fifth sentence Revise to read "See Figure 555-32-3 and Figure 555-33-4 for typical fire hose station arrangements."

r. Page 555-52, paragraph 555-33.8.1, Delete first sentence that

reads, "The Navy nozzle used on seawater and AFFF (SSN 21) hoses and on the freshwater hose reels (SSN 21) is referred to as the vari-nozzle." and substitute: "The Navy nozzle used on submarine seawater hoses, AFFF/SW hoses (SSN 21 and SSN 774), the AFFF/SW hosereels (SSN 774) and on the freshwater hose reels (SSN 21) is referred to as the vari-nozzle."

s. Page 555-55, Table 555-33-4

(1) For Size 3/4 Vari-Nozzle, under column "Application" delete "Fresh water hose reel, SSN-21 class" and substitute two lines that

read "Fresh water hosereel (SSN-21 Class)" and "AFFF/SW hosereel (SSN-774 class)"

(2) For Size 1-1/2 Vari-nozzle, under column "Application" delete "AFFF or Seawater hose lines" and substitute "AFFF/SW hose lines"

t. Page 555-58, paragraph 555-34.4.3.2, second sentence change "...seawater of AFFF" to "...seawater or AFFF/SW"

u. Page 555-69, paragraph 555-35.3.2.3.d., After the third sentence add new sentence, "On SSN 774 Class, the combination of smoke curtains, smoke stops and existing structure permits the establishing of primary fire and smoke boundaries. Primary boundaries contain smoke and heat in the fire zone and are not part of the active desmoking flowpath, when the flow path is established to improve tenability outside of the fire zone."

v. Page 555-97, paragraph 555-35.8.2., insert after second sentence, "This procedure shall be performed based on the recommendations from the man in charge at the scene of the fire and based on environmental conditions in the control room. As a rule of thumb, this procedure should be implemented for forward compartment fires that cannot be extinguished with portable extinguishers, fires that cannot be approached without protective clothing, and fires that have spread to the overhead or outboard hull insulation."

w. Page 555-97, paragraph 555-35.8.2.1. Third sentence, Delete; "On the SSN 21 Class," and substitute; "On the SSN 21 and SSN 774 Classes,"

x. Page 555-97, paragraph 555-32.8.2.c., End of sentence, delete ", and reactor containment."

y. Page 555-97, paragraph 555-35.8.3. Delete second sentence that reads "For a fire in port, the desmoking ventilation options are given in Table 555-35-1 through Table 555-35-1B and Figure 555-35-10 through Figure 555-35-15." and substitute; "For a fire in port, the desmoking ventilation options are given in Table 555-35-1 through Table 555-35-1B and Figure 555-35-10 through Figure 555-35-18."

z. Page 555-99, Figure 555-35-10, Delete Immediate Actions

aa. Page 555-100, Figure 555-35-11, Delete Immediate Actions

ab. Page 555-101, Figure 555-35-12, Delete Immediate Actions

ac. Page 555-103, Figure 555-35-13, Delete Immediate Actions

ad. Page 555-104, Figure 555-35-14, Delete Immediate Actions

ae. Page 555-105, Revise Table 555-35-1B: Insert references under Active Desmoking Options, Mechanical Ventilation Desmoking forward compartment "[Figure 555-35-23](#)", and insert reference under Active Desmoking Options, Mechanical Ventilation Desmoking of Engine Room "[Figure 555-35-24](#)".

af. Page 555-106, Figure 555-35-15, Delete Immediate Actions

ag. After Page 555-106 Insert new: Figure 555-35-16, SSN774 Class, Fire In Port, Natural Ventilation Desmoking of Forward Compartment

ah. After Page 555-106 Insert new: Figure 555-35-17 SSN774 Class, Fire In Port, Mechanical Ventilation Desmoking of Forward Compartment

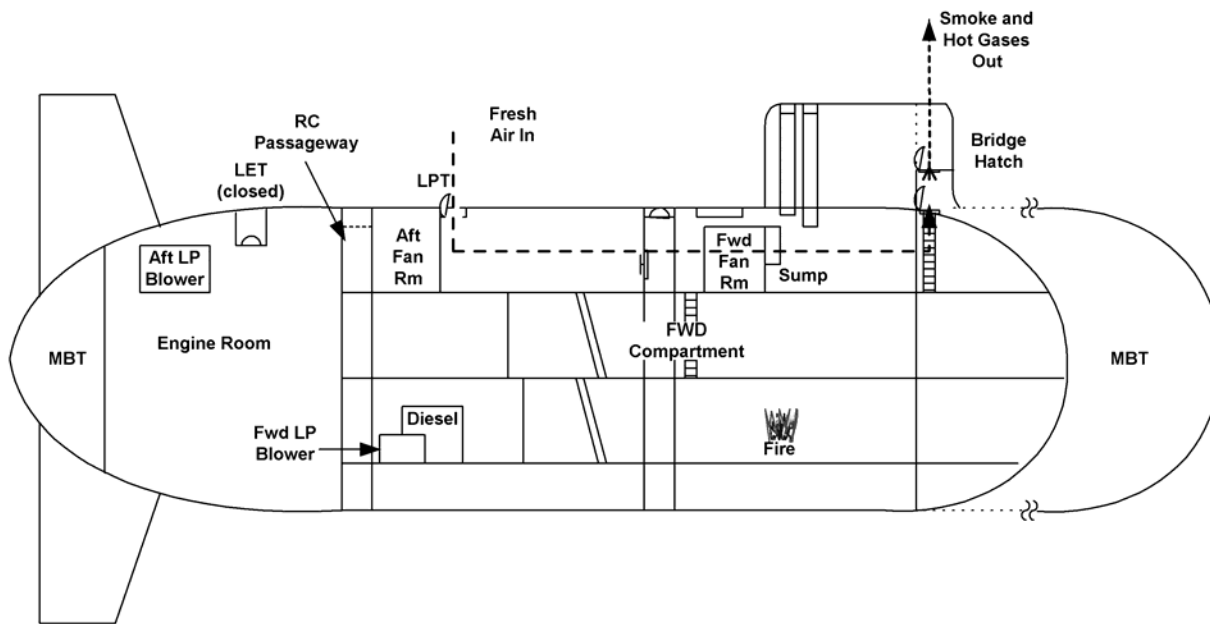
ai. After Page 555-107 Insert new: Figure 555-35-18 SSN774 Class, Fire In Port, Natural Ventilation Desmoking of Engine Room

Initial Conditions:

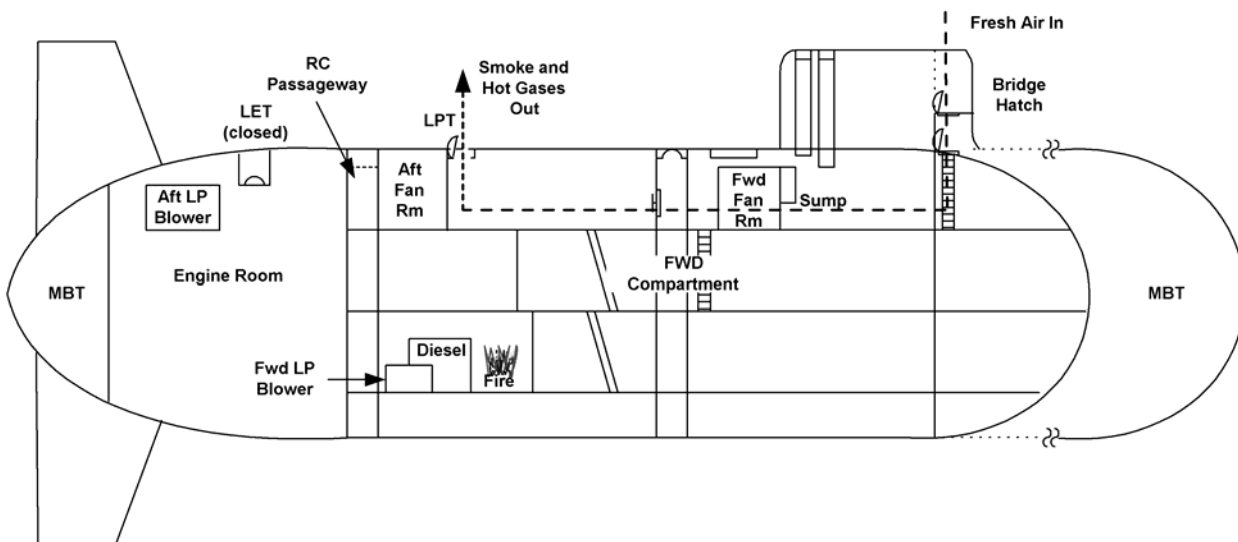
- Surface Ventilate Mode with at least one topside hatch open (open boat)

Objectives:

- Establish and maintain tenable conditions for egress from and reentry to the fire compartment and staging area for the fire party.



Fire Forward of Mid Span Bulkhead



Fire Aft of Mid Span Bulkhead

Figure 555-35-16 SSN 774 Class, Fire In Port, Natural Ventilation Desmoking of Forward Compartment

Initial Conditions:

- Surface Ventilate Mode with at least one topside hatch open (open boat)

Objectives:

- Establish and maintain tenable conditions for egress from and reentry to the fire compartment and staging area for the fire party.

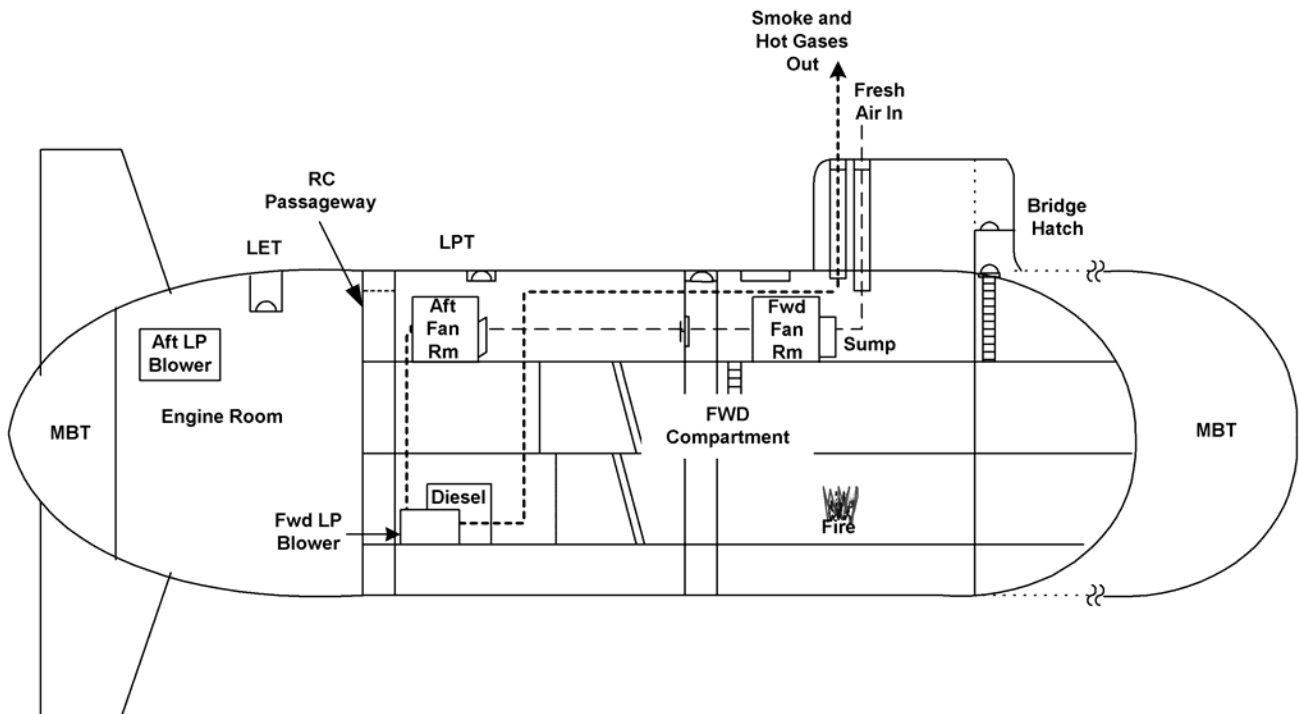


Figure 555-35-17 SSN 774 Class, Fire in Port, Mechanical Ventilation Desmoking of Forward Compartment.

Initial Conditions:

- Surface Ventilate Mode with at least one topside hatch open (open boat)

Objectives:

- Establish and maintain tenable conditions for egress from and reentry to the fire compartment and staging area for the fire party.

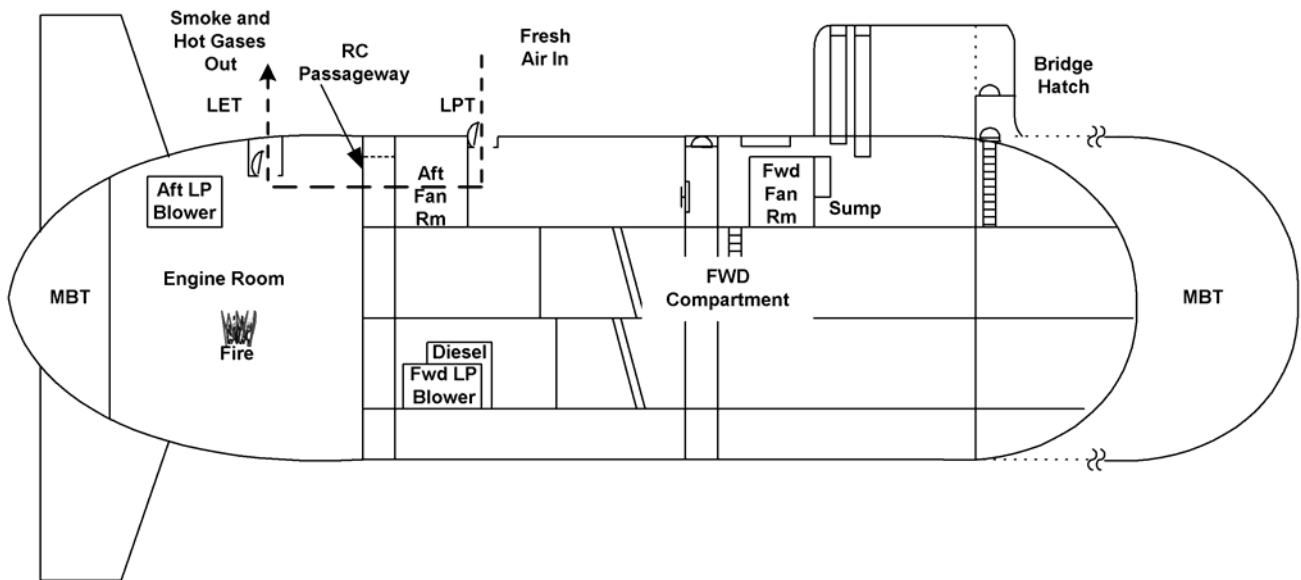


Figure 555-35-18 SSN774 Class, Fire In Port, Natural Ventilation Desmoking of Engine Room

aj. Page 555-107, paragraph 555-35.8.3.1.

(1) Delete first sentence that reads "For a fire in port in any forward compartment location except near the forward escape trunk hatch, the preferred method of exhaust is natural ventilation desmoking through the bridge hatch, see Table 555-35-1, Table 555-35-1A, Table 555-35-1B and Figure 555-35-10, Figure 555-35-13, and Figure 555-35-15." and substitute; "With the exception of SSN774 Class, for a fire in port in any forward compartment location except near the forward escape trunk hatch, the preferred method of exhaust is natural ventilation desmoking through the bridge hatch, see Table 555-35-1, Table 555-35-1A, Table 555-35-1B, and, Figure 555-35-10, Figure 555-35-13, Figure 555-35-15.

(2) Add new last sentence: "For SSN774 Class fire, in port, in the forward compartment see Figure 555-35-16 and VIRGINIA Class SSMS."

ak. Page 555-107, paragraph 555-35.8.3.1.1.

(1) Delete first two sentences that read "For SSN 688 class and SSN 21 class submarines, mechanical desmoking is needed only when natural ventilation desmoking is not effective. For SSN 688 Class see Table 555-35-1, Figures 555-35-11 and 555-35-16, for SSN 21 Class see Table 555-35-1B, Figures 555-35-15 and 555-35-20." and substitute: "For SSN 688 class, SSN 21, and SSN774 class submarines, mechanical desmoking is needed only when natural ventilation desmoking is not effective. For SSN 688 Class see Table 555-35-1 and Figure 555-35-11, for SSN 21 Class see Table 555-35-1B, Figures 555-35-15 and 555-35-20, for SSN-774 Class see Figure 555-335-17 and VIRGINIA Class SSMS."

(2) Third sentence replace, "SSN 688" with "any" and drop the "s" on "submarines".

al. Page 555-107, replace existing paragraph 555-35.8.3.1.2. with:  
"555-35.8.3.1.2 Desmoking a Fire Near the Forward Escape Trunk. For a fire near the forward escape trunk hatch, the preferred method of exhaust is natural ventilation desmoking with the forward escape trunk hatch or the bridge hatch, or both. For a fire on SSN-774 Class submarines near the LPT, the preferred method of exhaust is natural ventilation desmoking through the LPT, with fresh air provided through the bridge hatch. For SSN 688 Class and SSN-21 Class submarines, natural desmoking is accomplished with one or more of these hatches open as a vent and the aft escape trunk hatch open to allow fresh air to sweep through the side passageway. Reentry through the forward escape trunk is not practical because of the fire's proximity to the trunk. For a fire near the forward escape trunk, hot fire gases tend to vent through both the forward escape trunk hatch and the bridge hatch. Opening the aft escape trunk hatch will establish a fresh air supply for firefighter reentry through the side passageway with a wind-at-the-back effect. For SSBN 726 Class submarines, firefighter

reentry may also be via the midships escape trunk hatch through the missile compartment. For SSN-774 Class submarines firefighter reentry will be from the LET and through the reactor compartment passageway with a wind-at-the-back effect."

am. Page 555-107, paragraph 555-35.8.3.3.

(1) Delete first two sentences that read, "For a fire in the engine room, the preferred method is natural desmoking exhaust through the aft escape trunk hatch, see Table 555-35-1 and Figure 555-35-12. Natural desmoking of the engine room is accomplished with the aft escape trunk hatch open as a vent and the forward escape trunk hatch open to allow fresh air to sweep through the side passageway (midships escape trunk hatch for SSBN726 Class)." and substitute: "For a fire in the engine room on any class submarine, the preferred method is natural desmoking exhaust through the aft escape trunk hatch (LET), see Table 555-35-1, and Figure 555-35-12 and Figure 555-35-18 for typical examples. Natural desmoking of the engine room is accomplished with the aft escape trunk hatch (LET) open as a vent and the forward escape trunk hatch open to allow fresh air to sweep through the side passageway (midships escape trunk hatch for SSBN726 Class, or LPT)."

(2) Delete last two sentences that read, "For SSBN 726 Class and SSN-21 Class submarines, mechanical ventilation of engine room is possible due to location of the exhaust vents within the space. For mechanical ventilation desmoking of the SSBN 726 class and SSN 21 class engine room while in port, see Table 555-35-1A, Table 555-35-1B and see paragraph 555-35.8.4.4.2 and 555-35.8.4.4.3, respectively." and substitute "For SSBN 726 Class, SSN-21 Class, and SSN 774 Class submarines, mechanical ventilation of engine room is possible due to location of the exhaust vents within the space. For mechanical ventilation desmoking of the SSBN 726 class, SSN 21 class, and SSN 774 Class engine room while in port, see Table 555-35-1A, Table 555-35-1B, and Figure 555-35-26, see paragraphs 555-35.8.4.4.2, 555-35.8.4.4.3, and 555-35.8.4.4.4 respectively."

am. Page 555-108, paragraph 555-35.8.4.1.

(1) Add at end of first sentence ", except for SSN 774 Class."

(2) Add new second sentence "Due to the arrangement of SSN 774 Class, active desmoking can be performed by taking fresh air in through the induction mast, and exhausting overboard via the LP blower."

(3) Delete existing second sentence, "For a fire while underway, the desmoking ventilation options are given in Table 555-35-2, 555-35-2A and 555-35-2B, and Figure 555-35-16 through Figure 555-35-21." And substitute, "For a fire while underway, the desmoking ventilation

options are given in Table 555-35-2, 555-35-2A, 555-35-2B, and Figure 555-35-19 through Figure 555-35-26."

an. Page 555-109, Figure 555-35-16,  
(1) Renumber as 555-35-19  
(2) Delete Immediate Actions

ao. Page 555-110, Figure 555-35-17,  
(1) Renumber as 555-35-20  
(2) Delete Immediate Actions

ap. Page 555-111, Figure 555-35-18,  
(1) Renumber as 555-35-21  
(2) Delete Immediate Actions

aq. Page 555-112, Figure 555-35-19,  
(1) Renumber as 555-35-22  
(2) Delete Immediate Actions

ar. Page 555-113, Figure 555-35-20,  
(1) Renumber as 555-35-23  
(2) Delete Immediate Actions

as. Page 555-114, Figure 555-35-21,  
(1) Renumber as 555-35-24  
(2) Delete Immediate Actions

at. Page 555-114, Insert new Figure 555-35-25 SSN 774 Class, Fire At  
Sea, Mechanical Ventilation Desmoking of Forward Compartment

au. Page 555-114, Insert new Figure 555-35-26 SSN 774 Class, Fire At  
Sea, Mechanical Ventilation Desmoking of Engine Room

Initial Conditions:

- Recirculate Mode with all topside hatches closed (closed boat)

Objectives:

- Establish and maintain tenable conditions in the control room.

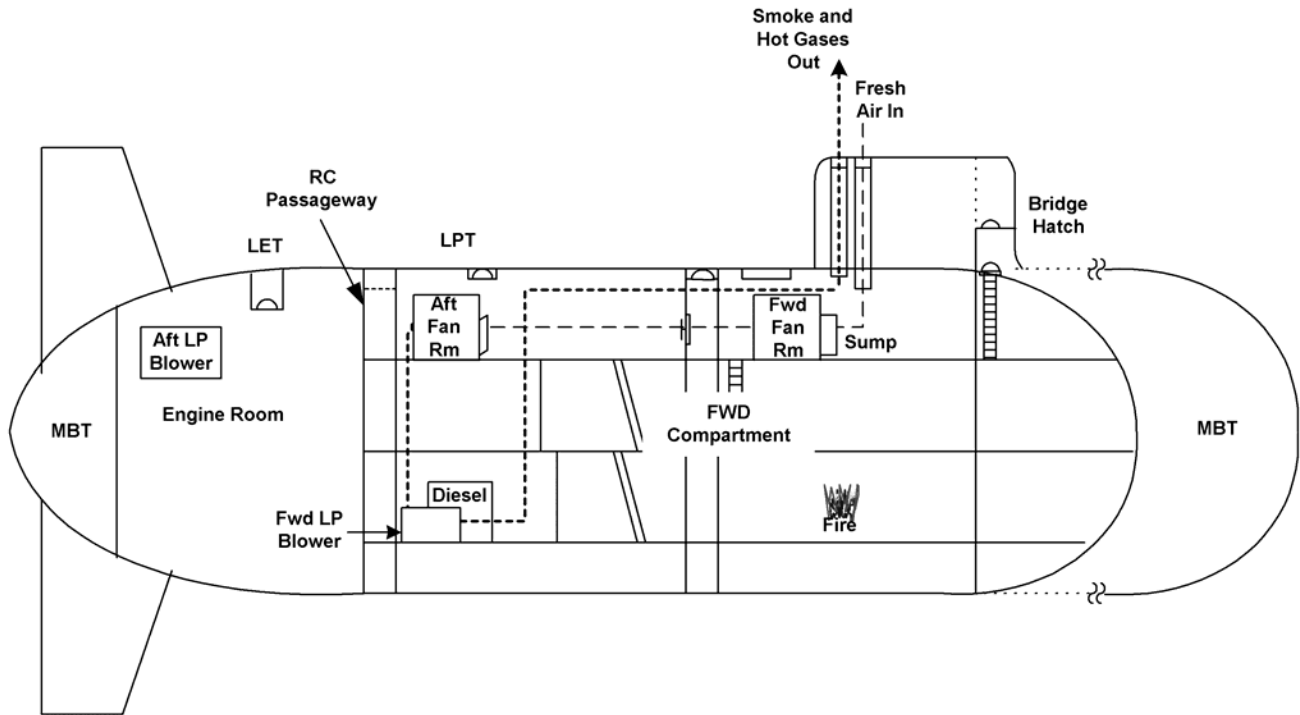


Figure 555-35-25. SSN 774 Class, Fire At Sea, Mechanical Ventilation Desmoking of Forward Compartment.

Initial Conditions:

- Recirculate Mode with all topside hatches closed (closed boat)

Objectives:

- Establish and maintain tenable conditions in the control room.
- Improve egress from and reentry into the Engine Room (fire compartment)

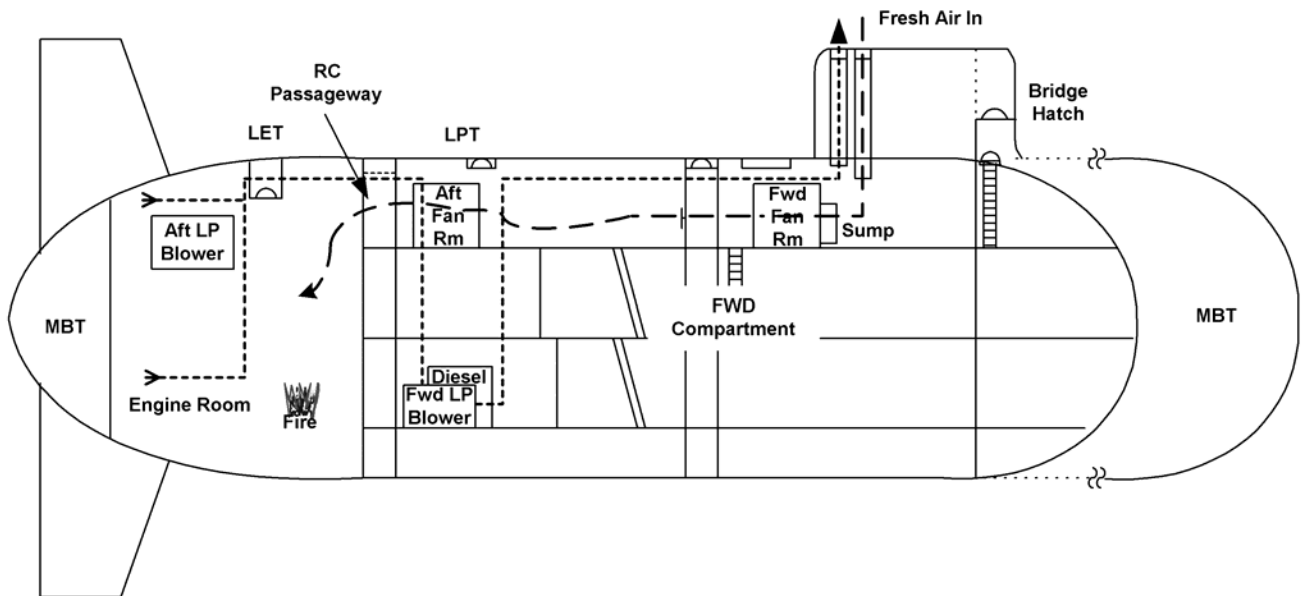


Figure 555-35-26 SSN 774 Class, Fire At Sea, Mechanical Ventilation Desmoking of Engine Room

av. Page 555-119, paragraph 555-35.8.4.2 Delete first two sentences that read, "For a fire while underway in any forward compartment location for SSN 688 class and SSN 21 class submarines, except the control room, the preferred method is mechanical ventilation desmoking. Mechanical desmoking is done by exhaust through the control room emergency ventilation terminal and a bridge hatch fresh air supply; use either LP blower or diesel engine, see Table 555-35-2, Figure 555-35-16 and Figure 555-35-20." And substitute, "For a fire while underway in any forward compartment location for SSN 688 class, SSN 21 and SSN 774 Class submarines, except the control room, the preferred method is mechanical ventilation desmoking. For SSN 688 class and SSN 21 class, mechanical desmoking is done by exhaust through the control room or galley emergency ventilation terminal with a bridge hatch fresh air supply; use either LP blower or diesel engine, see Table 555-35-2, Table 555-32-B, and Figure 555-35-16, and 555-35-23. For SSN 774 Class, see Figure 555-35-25 and VIRGINIA Class SSMs."

aw. Page 555-120, paragraph 555-35.8.4.4. Delete third sentence that reads, "For SSBN 726 and SSN 21 class submarines, mechanical ventilation as described below is the preferred method." And substitute, "For SSBN 726, SSN 21, and SSN 774 Class submarines, mechanical ventilation as described below is the preferred method."

ax. Page 555-121, Insert new paragraph, "555-35.8.4.4.4 SSN 774 Class. For SSN-774 class submarines while underway, see Figure 555-35-26 and VIRGINIA Class SSMs."

ay. Page 555-133, paragraph 555-36.5.3, second sentence, delete "For the SSN 21 class submarine, AFFF is preferred over water for class B fires." and substitute "Where AFFF injection capability is provided with seawater on submarines, AFFF is preferred over water for class B fires."

az. Page 555-135 paragraph 555-36.7.1.3, fifth sentence, delete "Refrigerant R-12 or R-114 gases coming in contact with flames or hot metal form hydrogen fluoride and hydrogen chloride, both of which are highly corrosive." and replace with " Refrigerant R-12, R-114, or HFC 134a gases coming in contact with flames or hot metal form hydrogen fluoride and hydrogen chloride, both of which are highly corrosive, HFC 134a may also decompose to form carbonyl fluoride."