

U.S.C.G. Merchant Marine Exam

QMED

Q806 Fireman – Watertender

(Sample Examination)

Choose the best answer to the following Multiple-Choice Questions.

1. If emergency welding repairs must be made to the upper area of a fuel tank, the tank and/or adjacent compartments may need to be _____.
- A. gas freed
 - B. filled with water
 - C. inerted
 - D. all of the above as necessary

Correct answer: D

2. While underway on a steamship, the main condenser is operating under a 28.09 "Hg vacuum gauge. According to the illustrated properties of saturated steam table, how much condensate depression would there be if the condensate temperature leaving the main condenser hot well is 96.0°F? Illustration SG-0026
- A. 1.83°F
 - B. 2.24°F
 - C. 8.71°F
 - D. 70.15°F

Correct answer: B

3. What type of respiratory protection provides the greatest protection from the various respiratory hazards, is specifically designed for emergency and rescue situations, but has time constraints associated with its use?
- A. Emergency escape breathing apparatus
 - B. Self-contained breathing apparatus
 - C. Powered air-purifying respirator
 - D. Reusable full-mask respirator

Correct answer: B

4. After taking on fuel oil, the hoses should be disconnected and _____.
- A. draped over the fantail to dry out
 - B. drained into buckets or fuel tanks
 - C. drained into the bilges and washed out
 - D. drained over the side and washed out

Correct answer: B

5. With regard to the relative flow patterns through the tubes and the shell of single pass shell-and-tube heat exchangers, what statement is true?
- A. In a counterflow heat exchanger, the flow through the tubes and the flow through the shell are in the same direction.
 - B. In a parallel-flow heat exchanger, the flow through the tubes and the flow through the shell are in opposite directions.
 - C. In a cross-flow heat exchanger, the flow through the tubes and the flow through the shell are in opposite directions.
 - D. In a counterflow heat exchanger, the flow through the tubes and the flow through the shell are in opposite directions.

Correct answer: D

6. Where is the location of a chain-operated valve when a chain wheel is attached to the stem and is associated with an endless chain for operation?
- A. The valve is located too far directly across from the location where it is operated.
 - B. The valve is located too far directly above the deck where it is operated from.
 - C. The valve is located too far directly below the deck where it is operated from.
 - D. A chain-operated valve can be used in any of the applications listed above.

Correct answer: B

7. What is the primary purpose of a reach rod as used as a valve remote operator?
- A. It changes the type of motion normally required to operate the valve.
 - B. It reverses the direction of rotation normally required to operate the valve.
 - C. It decreases the turning effort required to operate the valve.
 - D. It allows for the operation of valves that would otherwise be out of reach.

Correct answer: D

8. The advantage of using a dry chemical fire extinguishing agent is _____.
- A. permanent extinguishment regardless of the reignition sources
 - B. its good stability and non-toxicity
 - C. its excellent cooling ability
 - D. all of the above

Correct answer: B

9. Fire detecting systems on merchant vessels may be arranged to sense _____.
- A. ionized particles
 - B. smoke
 - C. rate of temperature rise
 - D. all of the above

Correct answer: D

10. What type of wound is most susceptible to a tetanus (lockjaw) infection?
- A. Incision
 - B. Puncture
 - C. Abrasion
 - D. Laceration

Correct answer: B

11. The component in an inert gas system used for cleaning the gas of solid and sulfur combustion products, while simultaneously cooling the inert gas, is called the _____.
- A. cooler
 - B. filter
 - C. purifier
 - D. scrubber

Correct answer: D

12. The tool used for cutting external pipe threads is called a pipe _____.

- A. ratchet cutter
- B. cutter
- C. threader
- D. stock and die

Correct answer: D

13. If a person gets something in his eye and you observe that it is not embedded, you can _____.

- A. remove it with a match or toothpick
- B. get him to rub his eye until the object is gone
- C. remove it with a piece of dry sterilized cotton rag
- D. remove it with a moist cotton-tipped applicator

Correct answer: D

14. What is a quick and effective way of determining whether or not a boiler water gauge glass is operating properly?

- A. Quickly opening and then reclosing the gauge glass lower root valve.
- B. Watching for the level to fluctuate in the glass corresponding to ship movements such as pitching.
- C. Quickly opening and then reclosing the gauge glass drain valve.
- D. Quickly opening and then reclosing the gauge glass upper root valve.

Correct answer: C

15. On a ship with a continuously manned engine room, with a three-person watch rotation, what is the watch and rest period rotation?

- A. 4 hours on watch followed by 8 hours rest
- B. 6 hours on watch followed by 6 hours rest
- C. 8 hours on watch followed by 4 hours rest
- D. 8 hours on watch followed by 8 hours rest

Correct answer: A

16. The primary function of an automatic sprinkler system is to _____.

- A. limit the spread of the fire and control the amount of heat produced
- B. instantaneously extinguish the fire which triggered it
- C. protect high value electronic equipment in adjacent areas which have had sprinkler heads installed
- D. alert the crew to the fire

Correct answer: A

17. High concentrations of hydrogen sulfide gas are most dangerous to personnel because they can _____.

- A. paralyze your breathing system
- B. cause involuntary skeletal muscle contractions
- C. cause dizziness
- D. cause eye inflammation

Correct answer: A

- 18.** Which of the following shoring materials is used to tightly make up the difference in length of a shore cut slightly shorter than the measured distance for required length and must be frequently checked for tightness?
- A. Strongback
 - B. Shole
 - C. Wedge
 - D. Beam

Correct answer: C

- 19.** What would be the most probable cause for a high-pressure alarm to be activated in a low-pressure CO₂ fixed fire extinguishing system?
- A. The pilot cylinder discharge valve is leaking.
 - B. The tank cooling system has malfunctioned.
 - C. An excessive amount of insulation has been installed on the tank and piping.
 - D. An air leak has developed in the tank.

Correct answer: B

- 20.** If you see an individual fall overboard, you should _____.
- A. throw a life ring overboard
 - B. pass the word to the bridge
 - C. hail "Man Overboard"
 - D. all of the above

Correct answer: D

- 21.** What is the purpose of the main steam stop bypass valve?
- A. isolate the main steam stop for repairs while steaming
 - B. supply auxiliary steam when the main steam stop is closed
 - C. cross-connect two steaming boilers
 - D. gradually increase the pressure and temperature of the main steam piping when warming up

Correct answer: D

- 22.** After prior isolation and lock-out/tag-out procedures are performed, which electrical device requires discharging any stored electrical energy before any work may safely begin?
- A. capacitor
 - B. choke coil
 - C. resistor bank
 - D. potential transformer

Correct answer: A

- 23.** In a main propulsion steam turbine installation, the condensate pump initially discharges to the _____.
- A. deaerating feed tank
 - B. first stage heater
 - C. distillate tank
 - D. air ejector condenser

Correct answer: D

24. The property of a fuel oil which is a measurement of its available energy, is known as its _____.

- A. cetane index
- B. viscosity index
- C. cetane number
- D. heating value

Correct answer: D

25. Which extinguishing agent is most likely to allow reflash as a result of not cooling the fuel below its ignition temperature?

- A. CO₂
- B. Water stream
- C. Foam
- D. Water fog

Correct answer: A

26. As a firefighting medium, CO₂ can be dangerous under certain conditions as it can cause _____.

- A. freeze burns and blistering
- B. undulation
- C. hallucinations
- D. carbon monoxide poisoning

Correct answer: A

27. By what criteria are hard hats (protective helmets) rated?

- A. They are rated by class of service as it applies to protection from exposure to electrical voltage only, such as no voltage, limited voltage, and high voltage protection.
- B. They are rated by whether or not the headband is adjustable and by the length of the bill on the shell.
- C. They are rated by type as it applies to direction of impact protection, and they are rated by class of service as it applies to protection from exposure to electrical voltage.
- D. They are rated by type as it applies to direction of impact protection only, such as impacts from the top or impacts from the top and side.

Correct answer: C

28. Enlarging one tube end so the end of another tube of the same size will fit inside is termed _____.

- A. swaging
- B. stretching
- C. flaring
- D. beelling

Correct answer: A

29. The DC heater functions to _____.

- A. heat feedwater
- B. store feedwater
- C. remove air from feedwater
- D. all of the above

Correct answer: D

30. What type of direct reading thermometer works on the principle of differential expansion of dissimilar metals as the temperature rises and features a rotary dial scale?

- A. Liquid-in-glass thermometer
- B. Bourdon tube thermometer
- C. Thermocouple pyrometer
- D. Bimetallic thermometer

Correct answer: D

31. Which factor determines the size of the ring dam for a fuel oil centrifugal purifier?

- A. The viscosity of the fuel.
- B. The quantity of water to be removed from the fuel.
- C. The specific gravity of the fuel.
- D. The quantity of dirt to be removed from the fuel.

Correct answer: C

32. Which of the following is the purpose of the steam drum in a D-Type marine boiler?

- A. maintains circulation by forcing steam bubbles downward in the generating tubes
- B. acts as a receptacle for heavy suspended solids in boiler feedwater
- C. provides a space for moisture to separate from the steam
- D. supports the superheater tube bank

Correct answer: C

33. In terms of the completeness of combustion, in viewing the flame through the peephole, what would be the indication of the LEAST complete combustion?

- A. Reddish flame
- B. Orange flame
- C. Golden yellow flame
- D. Yellow flame

Correct answer: A

34. After an emergency shoring installation has been completed, the _____.

- A. repair is completed and no further action is needed
- B. shoring should be frequently inspected for looseness
- C. damaged plating should be straightened by heating
- D. timbers are nailed in place to prevent looseness

Correct answer: B

35. How is lube oil pressure provided to a turbogenerator when starting the unit in an automated plant?

- A. the hand-operated or auxiliary lube oil pump
- B. the main lube oil pump
- C. a line from the other generator
- D. a line from the gravity tank

Correct answer: A

36. At a minimum threshold, how many milliamps of current through the body produces a condition where most people would experience respiratory paralysis and be unable to breathe while still in contact with the energized conductor?

- A. 3 to 7 mA
- B. 10 to 16 mA
- C. 30 mA
- D. 75 mA for 5 sec.

Correct answer: C

37. Why are two fuel oil heaters "E" provided in the fuel oil system shown in the illustration? Illustration SG-0009

- A. To allow fuel of different temperatures to be provided to each boiler.
- B. To provide a backup in case one of the heaters becomes inoperable.
- C. Two heaters are necessary when both boilers steam at full load.
- D. Each heater supplies fuel to a different boiler.

Correct answer: B

38. The terms rough, coarse, bastard, second cut, smooth, and dead smooth refer to the _____.

- A. distance between the parallel cuts of a file
- B. size of the file
- C. coarseness of file teeth
- D. both A and C are correct

Correct answer: D

39. Using a sea anchor when in a life raft will _____.

- A. reduce the drift rate of the life raft
- B. keep the life raft from turning over
- C. aid in recovering the life raft
- D. increase your visibility

Correct answer: A

40. Which of the following statements concerning fire-tube boilers is correct?

- A. Combustion gases flow through the tubes.
- B. Flames impinge on the tubes.
- C. Combustion occurs in the tubes.
- D. Water flows through the tubes.

Correct answer: A

41. Which of the following is NOT a treatment for traumatic shock?

- A. Keep the patient warm, but not hot.
- B. Relieve the pain of the injury.
- C. Massage the arms and legs to restore circulation.
- D. Have the injured person lie down.

Correct answer: C

42. When administering first aid you should avoid _____.

- A. unnecessary haste and appearance of uncertainty
- B. any conversation with the patient
- C. instructing bystanders
- D. touching the patient

Correct answer: A

43. Most lifeboats are equipped with _____.

- A. unbalanced rudders
- B. balanced rudders
- C. contra-guide rudders
- D. straight rudders

Correct answer: A

44. One function of the air receiver in a compressed air system is to _____.

- A. remove all traces of oil from the air
- B. minimize the system's line pulsations
- C. receive exhaust air from pneumatic accessories
- D. dry the air discharged from the intercooler

Correct answer: B

45. When an aluminum plate is bolted to a steel plate, what is required at the bolted joint to minimize bimetallic corrosion?

- A. The plates should be bolted together in such a way as to ensure good electrical contact between the plates.
- B. Steel and aluminum are so close together on the Noble series that no particular provision need be made for bolting steel and aluminum plates together.
- C. The plates should be electrically insulated from one another by use of non-conductive gaskets and non-conductive ferrule sleeves with the bolts.
- D. The plates should be bonded together electrically by joining the plates by a bonding strap in addition to bolting together.

Correct answer: C

46. Which characteristic of fuel oil is the most significant when determining the temperature to which the fuel oil must be heated for proper atomization?

- A. Flash point
- B. Viscosity
- C. Specific gravity
- D. Pour point

Correct answer: B

47. In order for microbiological growths to thrive in a fuel tank it is necessary for _____.

- A. vanadium to be present
- B. low temperatures to exist
- C. moisture or water to be present
- D. electrolysis to be occurring

Correct answer: C

48. Item 4 shown in the illustration represents a _____. Illustration GS-0125

- A. manifold
- B. suction line
- C. bilge system
- D. vacuum branch line

Correct answer: A

49. Steam supplied to the main propulsion turbines is _____.

- A. superheated steam
- B. desuperheated steam
- C. wet steam
- D. saturated steam

Correct answer: A

50. Which of the following conditions represents a particular advantage of using a positive pressure type self-contained breathing apparatus in an atmosphere that is immediately dangerous to life or health?

- A. The equipment used is lightweight and easy to wear by reducing physical strain on the wearer.
- B. The equipment is compact and the wearer can work in confined spaces without difficulty.
- C. The average operating time for most air cylinders is over an hour.
- D. The positive pressure in the facepiece prevents contaminated air from entering the facepiece.

Correct answer: D

51. Condensate return lines from tank heating coils are led to the _____.

- A. main condenser
- B. contaminated drain system
- C. atmospheric drain tank
- D. DC heater

Correct answer: B

- 52.** A pipe coupling is a fitting having _____.
- A. inside threads on both ends
 - B. a left-hand twist
 - C. outside threads on one end and inside threads on one end
 - D. outside threads on both ends

Correct answer: A

- 53.** When the compressed air reservoir is placed in line with an air compressor and is used as an aftercooler, what must be done with the reservoir?
- A. It must be frequently drained of condensed water.
 - B. It must be fitted with a moisture trap at the inlet.
 - C. It must be fitted with a sight glass.
 - D. It must be fitted with a manhole.

Correct answer: A

- 54.** A coolant is usually used when cutting metal in a power hacksaw to prevent the _____.
- A. cut from clogging
 - B. blade from catching on the work piece
 - C. blade from overheating
 - D. blade from bending

Correct answer: C

- 55.** What is the danger if a boiler is brought on the line with its steam pressure much higher than that of the boiler already on the line?
- A. an overloaded superheater
 - B. priming and carryover
 - C. thermal shock
 - D. low water

Correct answer: B

- 56.** The DC heater automatic level dump valve is used to _____.
- A. divert the flow of condensate from the first stage heater to the vent condenser
 - B. maintain a proper condensate level in the condenser hotwell
 - C. divert excess feedwater to the distilled water tank
 - D. recirculate condensate to the atmospheric drain tank

Correct answer: C

- 57.** Why is it important for double bottom fuel oil tanks not to be topped off when loading fuel at cold temperatures?
- A. Fueling valve may become stuck closed and cause the fuel oil to spill before the valve can be opened.
 - B. Increased viscosity of the product needs higher loading pressure, which increases the chances of a spill.
 - C. Air pockets may cause the fuel to bubble out of the ullage hole.
 - D. A temperature rise of the fuel will cause an overflow from the tank vent.

Correct answer: D

58. The main feed check valve functions to _____.

- A. reduce feed pump discharge pressure loading
- B. prevent backflow of water from the boiler in the event of a feed pump failure
- C. check pressure pulsations in the feed line
- D. provide feed pump positive discharge head

Correct answer: B

59. With regard to the number of passes through the tubes of shell-and-tube heat exchangers, what statement is true?

- A. In single-pass and two-pass heat exchangers, the inlet and outlet tube-side fluid connections are at the same end.
- B. In two-pass and four-pass heat exchangers, the inlet and outlet tube-side fluid connections are at opposite ends.
- C. In two-pass and four-pass heat exchangers, the inlet and outlet tube-side fluid connections are at the same end.
- D. In single-pass and two-pass heat exchangers, the inlet and outlet tube-side fluid connections are at opposite ends.

Correct answer: C

60. Which of the following labeled items of the illustrated section of boiler refractory represents the insulating block? Illustration SG-0003

- A. 1
- B. 3
- C. 4
- D. 7

Correct answer: D

61. According to the illustrated steam tables, what would be the superheater outlet temperature if saturated steam at 400 psia was elevated 192.83°F? Illustration SG-0004

- A. 192.83°F
- B. 247.31°F
- C. 444.59°F
- D. 637.42°F

Correct answer: D

- 62.** There are three pieces of information that should be included in delivering a message via a sound-powered telephone. Which of the following represents the proper sequence of information delivery?
- A. First: state the message. Second: give the name of the calling station. Third: give the name of the station being called.
 - B. First: state the message. Second: give the name of the station being called. Third: give the name of the calling station.
 - C. First: give the name of the station being called. Second: give the name of the calling station. Third: state the message.
 - D. First: give the name of the calling station. Second: give the name of the station being called. Third: state the message.

Correct answer: C

- 63.** When installing DANGER tags when performing a tag-out and lock-out procedure in preparation for accomplishing maintenance, what is the color of these tags?
- A. Orange
 - B. Red
 - C. Yellow
 - D. Green

Correct answer: B

- 64.** Which of the following types of bearings are used as line shaft bearings?
- A. Segmental, pivoted-shoe thrust
 - B. Ring-oiled, babbitt-faced, spherical seat, shell
 - C. Tapered roller, split type radial
 - D. Rigidly mounted, radial sleeve

Correct answer: B

- 65.** Which of the pumps listed operates at constant speed and delivers water to the deaerating feed tank at a nearly constant pressure?
- A. Main condensate pump
 - B. Main feed booster pump
 - C. Main circulating pump
 - D. Main feed pump

Correct answer: A

- 66.** In what remote temperature indicating system is a voltage generated by the magnitude of temperature difference between hot and cold junctions?
- A. Thermocouple
 - B. Resistance temperature detector
 - C. Bimetallic sensor
 - D. Thermistor

Correct answer: A

- 67.** If a fire broke out in an automation console, you would first secure the power and then proceed to use which of the listed hand portable fire extinguishers?
- A. CO2
 - B. Foam
 - C. Soda acid
 - D. Dry chemical

Correct answer: A

- 68.** Which of the tanks, shown in the illustration, supplies fuel to the emergency generator? Illustration MO-0058
- A. Diesel Oil Service Tank
 - B. Diesel Oil Settling Tank
 - C. Diesel Oil Boiler Tank
 - D. Diesel Oil Booster Tank

Correct answer: A

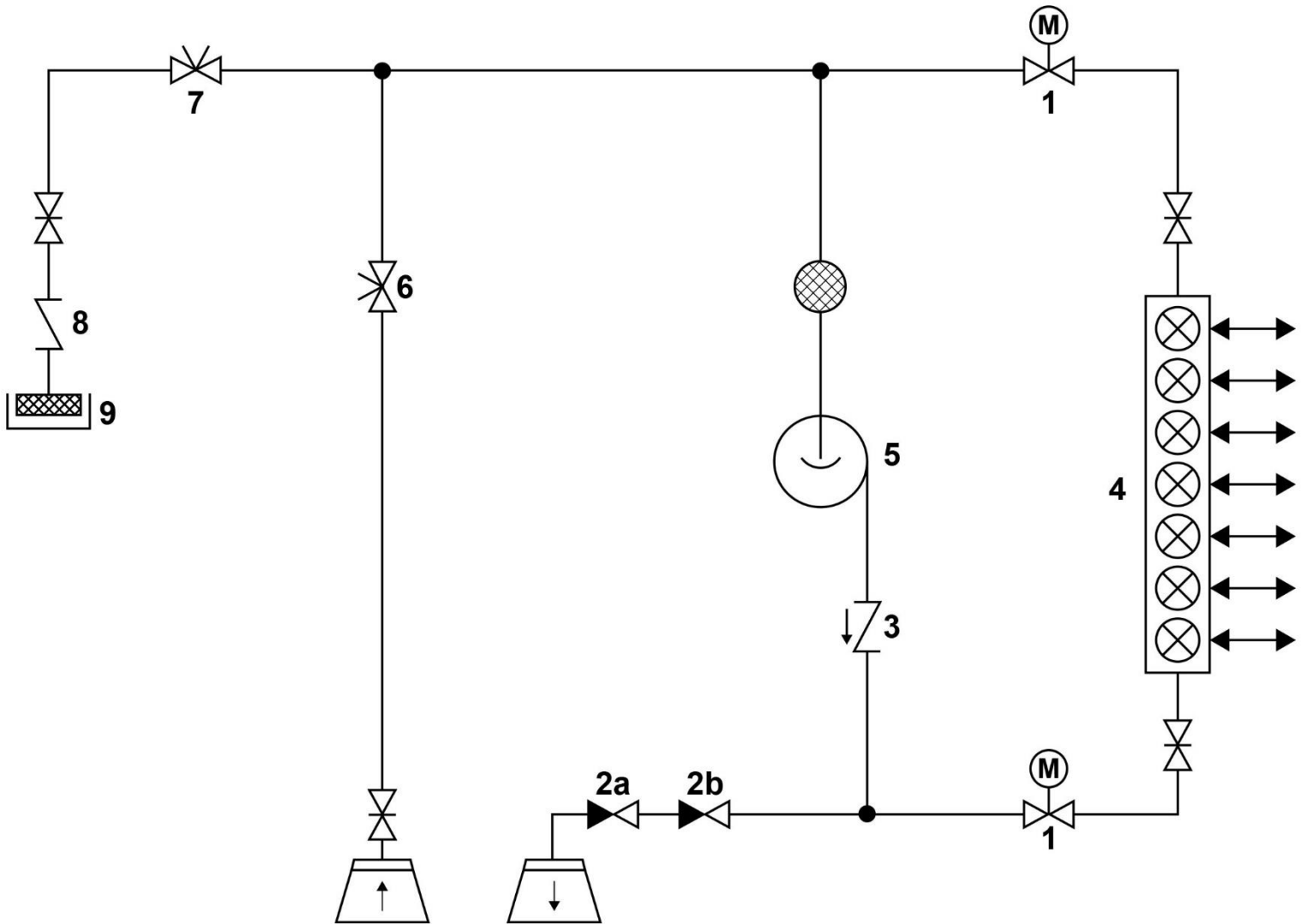
- 69.** What is the normal destination of steam exiting a main feed pump drive turbine?
- A. Deaerating feed tank via the main feed pump discharge line.
 - B. Deaerating feed tank via the auxiliary exhaust steam line.
 - C. Main condenser via the auxiliary exhaust steam line.
 - D. SSTG condensers via the auxiliary exhaust steam line.

Correct answer: B

- 70.** If you hear the general alarm sounded 3 times supplemented by 3 short blasts of the whistle, what does this indicate?
- A. Fire and emergency.
 - B. Abandon ship.
 - C. Dismissal from fire and emergency.
 - D. Dismissal from a boat drill.

Correct answer: C

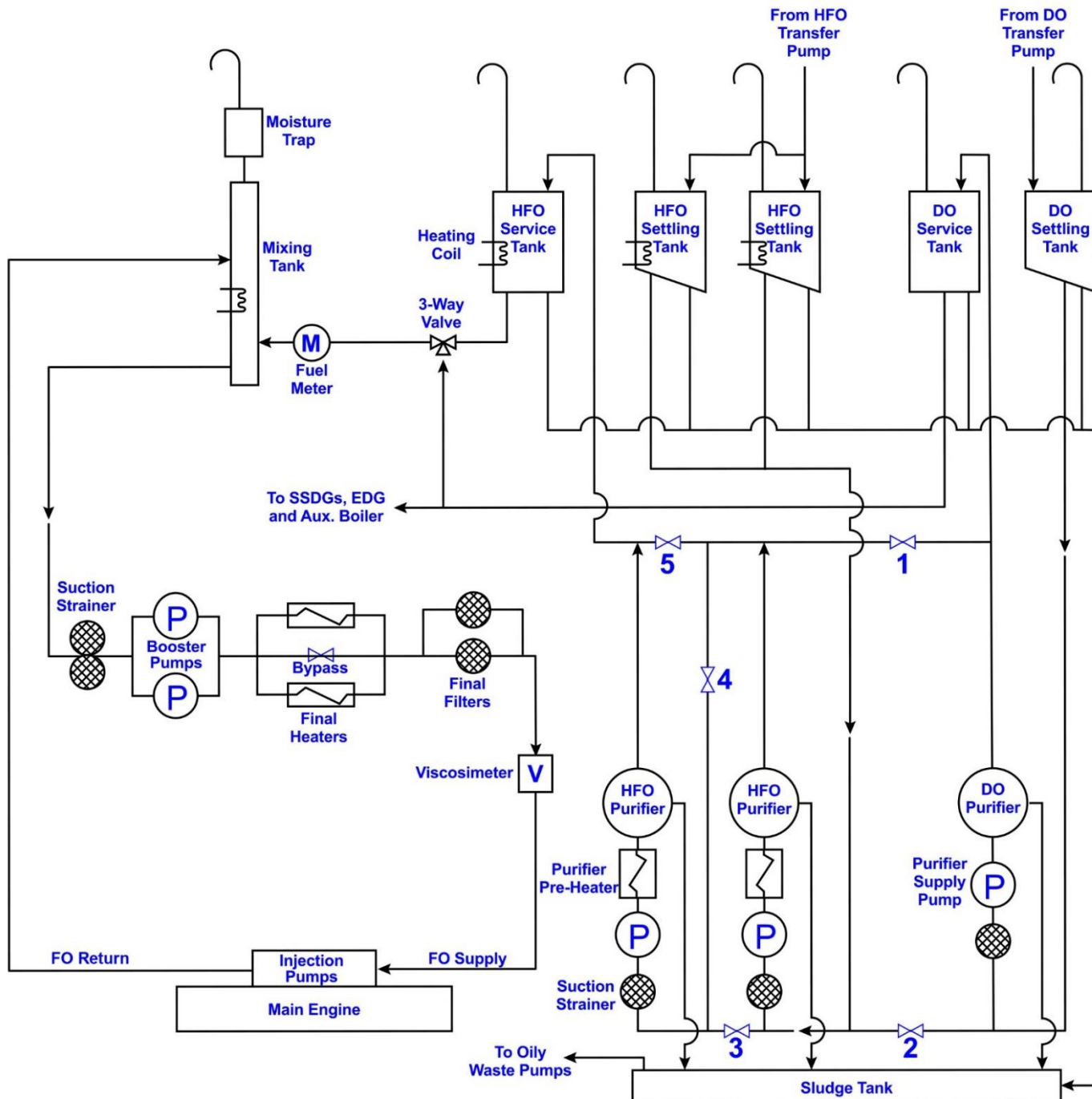
GS-0125



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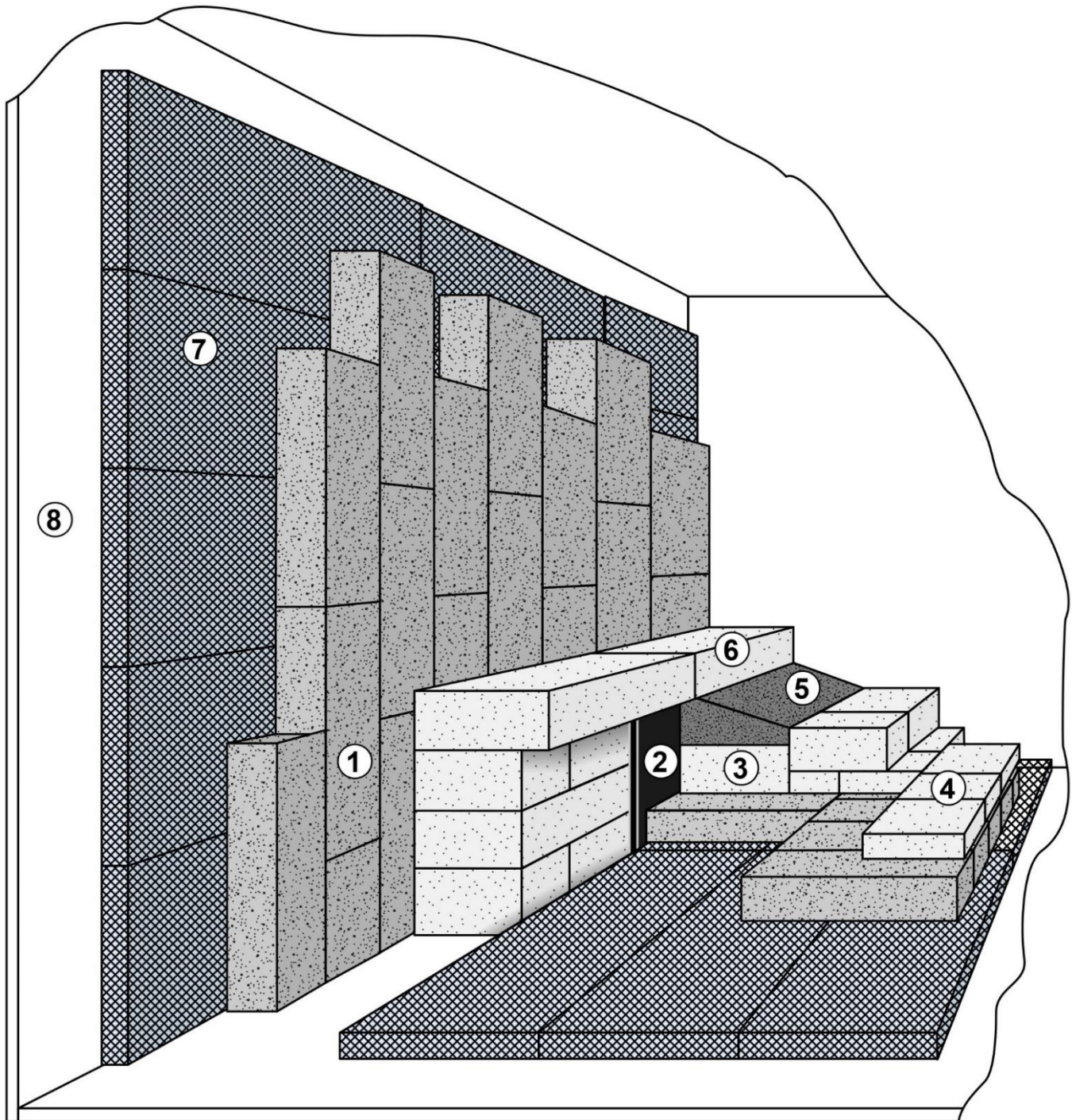
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SG-0003



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Applied to Marine Propulsion Power Plants
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United States Coast Guard National Maritime Center



SG-0004

Table 1
Thermodynamic Properties of
Saturated Steam (Temperature)

Temp, °F	Absolute Pressure, psi	Enthalpy (BTU/lb) of Liquid	Enthalpy (BTU/lb) of Evaporation	Enthalpy (BTU/lb) of vapor
32	0.08859	0.01	1075.5	1075.5
40	0.12170	8.05	1071.3	1079.3
50	0.17811	18.07	1065.6	1083.7
60	0.25630	28.06	1059.9	1088.0
70	0.36310	38.04	1054.3	1092.3
80	0.50690	43.02	1048.6	1096.6
90	0.69820	57.99	1042.9	1100.9
100	0.94920	67.97	1037.2	1105.2
110	1.27480	77.94	1031.6	1109.5
120	1.69240	87.92	1025.8	1113.7
130	2.22250	97.90	1020.0	1117.9
140	2.88860	107.90	1014.1	1122.0
150	3.71800	117.90	1008.2	1126.1
160	4.74100	127.90	1002.3	1130.2
170	5.99200	137.90	996.3	1134.2
180	7.51000	147.90	990.2	1138.1
190	9.33900	157.90	984.1	1142.0
200	11.52600	168.00	977.9	1145.9
212	14.69600	180.00	970.4	1150.4
220	17.18600	188.10	965.2	1153.4
240	24.96900	208.30	952.2	1160.5
280	49.20300	249.10	924.7	1173.8
300	67.01300	269.60	910.1	1179.7
340	118.01000	311.10	879.0	1190.1
380	195.77000	353.50	844.6	1198.1
400	247.31000	375.00	826.0	1201.0

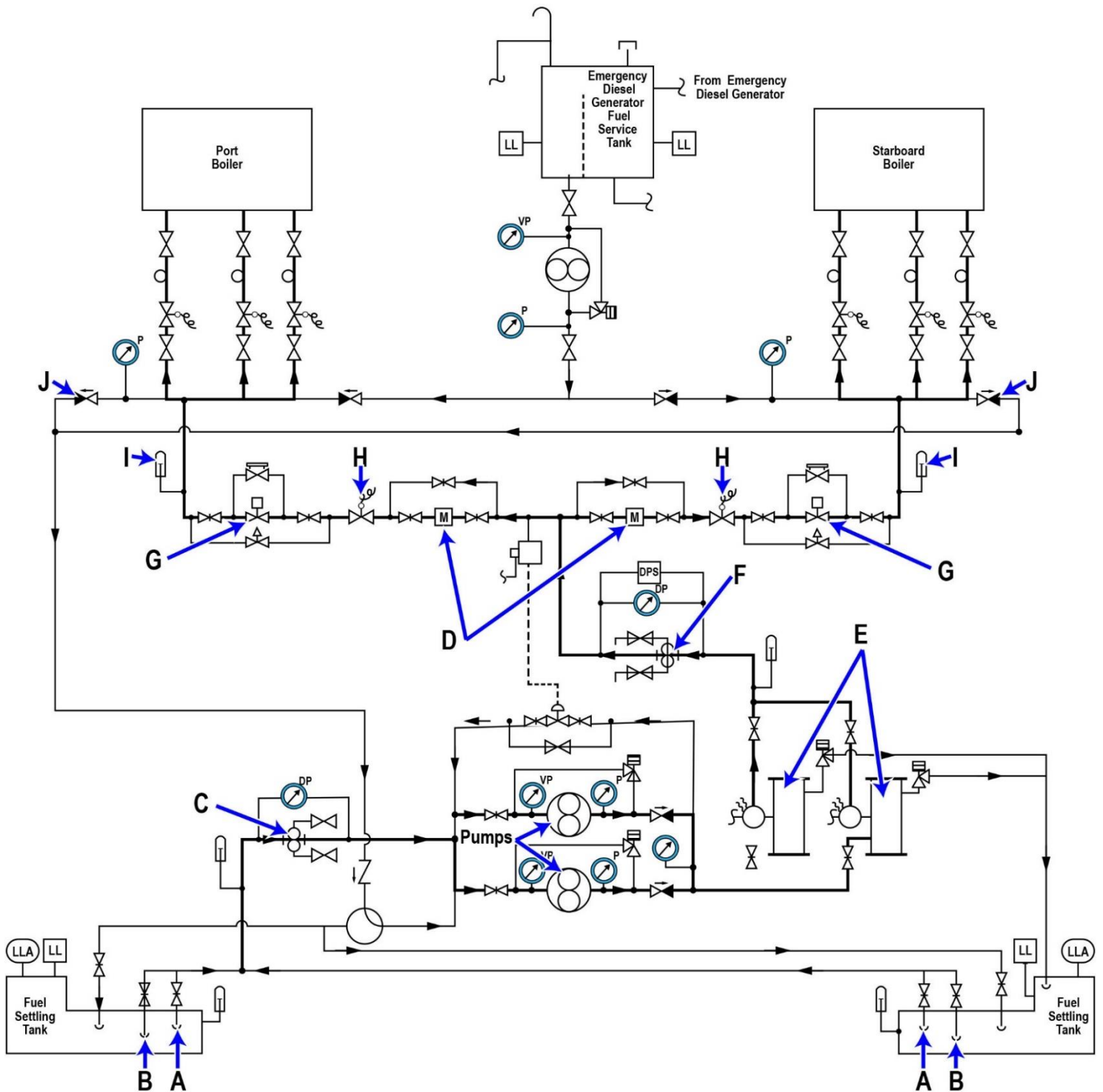
Table 2
Thermodynamic Properties of
Saturated Steam (Pressure)

Absolute Pressure, psi	Temp, °F	Enthalpy (BTU/lb) of Liquid	Enthalpy (BTU/lb) of Evaporation	Enthalpy (BTU/lb) of vapor
0.5	79.58	47.6	1048.8	1096.4
1.0	101.74	69.7	1036.3	1106.0
5.0	162.24	130.1	1001.0	1131.1
10.0	193.21	161.2	982.1	1143.3
14.7	212.00	180.0	970.4	1150.4
15.0	213.03	181.1	969.7	1150.8
20.0	227.96	196.2	960.1	1156.3
25.0	240.07	208.5	952.1	1160.6
30.0	250.33	218.8	945.3	1164.1
40.0	267.25	236.0	933.7	1169.7
50.0	281.01	250.1	924.0	1174.1
60.0	292.71	262.1	915.5	1177.6
70.0	302.92	272.6	907.9	1180.6
80.0	312.03	282.0	901.1	1183.1
90.0	320.27	290.6	894.7	1185.3
100.0	327.81	298.4	888.8	1187.2
110.0	334.77	305.7	883.2	1188.9
120.0	341.25	312.4	877.9	1190.4
130.0	347.32	318.8	872.9	1191.7
140.0	353.02	324.8	868.2	1193.0
150.0	358.42	330.5	863.6	1194.1
200.0	381.79	355.4	843.0	1198.4
250.0	400.95	376.0	825.1	1201.1
300.0	417.33	393.8	809.0	1202.8
350.0	431.72	409.7	794.2	1203.9
400.0	444.59	424.0	780.5	1204.5

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SG-0026

Properties of Saturated Steam

Vacuum Inches of Hg Gauge	Temperature °C	Temperature °F
29.51	11.74	53.14
29.41	15.17	59.30
29.31	18.04	64.47
29.21	20.52	68.93
29.11	22.70	72.86
29.00	24.66	76.38
28.90	26.43	79.58
28.70	29.56	85.21
28.49	32.27	90.08
28.29	34.66	94.38
28.09	36.80	98.24
27.88	38.74	101.74
27.48	42.18	107.92
27.06	45.14	113.26
26.66	47.77	117.99
26.26	50.13	122.23
25.85	52.27	126.08
25.44	54.23	129.62
25.03	56.05	132.89
24.63	57.74	135.94
24.22	59.33	138.79
23.81	60.82	141.48
22.79	64.21	147.57
21.78	67.21	152.97
20.76	69.91	157.83
19.74	72.36	162.24
18.72	74.61	166.30
17.70	76.70	170.06
16.69	78.64	173.56
15.67	80.47	176.85
14.65	82.14	179.86
13.63	83.81	182.86
12.61	85.36	185.64
11.60	86.82	188.28
10.58	88.22	190.80
9.56	89.57	193.21
7.52	92.08	197.75
5.49	94.42	201.96
3.45	96.60	205.88
1.42	98.64	209.56

**Adapted for testing purposes only
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