
Q537 - Steam Plants I

1. Coast Guard Regulations (46 CFR Part 56) permit copper pipe to be used for steam service subjected to a maximum pressure and temperature of _____.

- 350 psi and 460°F
- 350 psi and 406°F
- 250 psi and 460°F
- **250 psi and 406°F**

Note:
Coast Guard Regulations (46 CFR Part 56) limit copper pipe use in steam service to a maximum pressure and temperature of 250 psi and 406F.

---

2. Coast Guard Regulations (46 CFR) regarding hydrostatic testing of main steam piping state that _____.

- **the hydrostatic test shall be applied from the boiler drum to the throttle valve**
- not less than fifty percent of the lagging shall be removed each time the hydrostatic test is applied
- the hydrostatic test pressure must be maintained on the piping for a minimum of one hour
- a pipe with a nominal size of six inches or more is not required to be hydrostatically tested

Note:
Coast Guard regulations require hydrostatic testing of main steam piping to extend from the boiler drum to the throttle valve, ensuring the entire high-pressure path is tested.

---

3. The steam separator as used in conjunction with a steam whistle normally drains to which of the listed drain systems?

- Main turbine
- Low-pressure
- Contaminated
- **High-pressure**

Note:
The steam separator drain from a steam whistle, operating at boiler or auxiliary steam pressure, must discharge into the ship's high-pressure drain system designed for those pressures.

---

4. The net positive suction head of a boiler centrifugal feed pump should be calculated over and above the _____.

- **feed water vapor pressure**
- speed of the impeller
- pump capacity in gpm
- impeller ratio of the pump

Note:
NPSH must be calculated above the feed water vapor pressure to prevent cavitation. NPSH represents the absolute pressure at the pump suction above the liquid's vapor pressure, ensuring the liquid does not flash to vapor at the impeller eye. This calculation is fundamental to pump operation and prevents damage from cavitation.

---

5. The leakage of air into the pump casing by way of the packing gland of a condensate pump, is prevented by _____.

- **a water seal line to the packing gland**
- an air seal line from the compressed air line
- special packing in the stuffing box
- the vacuum in the pump suction

Note:
Air leakage through a condensate pump's packing gland is prevented by a water seal line to the packing gland, which floods the packing and blocks air ingress due to the vacuum on the pump suction.

---

6. Which of the conditions listed could prevent a centrifugal condensate pump from developing its rated capacity?

- Flooding of the main condenser hotwell.
- Operating the pump with a positive suction head.
- Venting the pump to the vacuum side of the condenser.
- **Closing the water seal line to the packing gland.**

Note:
Closing the water seal line to the packing gland allows air to enter the pump, leading to air-binding and preventing it from achieving its rated capacity.

---

7. At a given pressure, erosion of steam piping and machinery will be minimized by utilizing _____.

- wet steam
- **superheated steam**
- saturated steam
- desuperheated vapor

Note:
Superheated steam minimizes erosion because it lacks liquid droplets, preventing the sandblasting effect caused by wet or saturated steam.

---

8. Which of the following systems can normally be supplied by auxiliary exhaust steam?

- Boiler steam atomizers
- Main feed pump
- **Low-pressure evaporator**
- Air ejectors

Note:
Low-pressure evaporators are designed to utilize low-pressure auxiliary exhaust steam as a heat source; other systems require higher pressure steam.

---

9. The primary source of steam to the auxiliary exhaust system is typically supplied directly from _____.

- the main engine LP bleed
- **turbine driven and reciprocating steam pumps**
- the turbine gland exhaust system
- all of the above

Note:
Turbine driven and reciprocating steam pumps are the primary source of steam for the auxiliary exhaust system due to their large, continuous exhaust volumes.

---

10. The turbo generator steam stop is located between the superheater outlet and the main steam stop valve to _____.

- provide for easier access
- provide higher quality steam for the turbo generators
- provide a flow of cooling steam through the control desuperheater
- **allow the use of superheated steam in the turbo generator without pressurizing the larger main steam line**

Note:
The turbo generator steam stop is positioned between the superheater outlet and the main steam stop valve to allow the turbo generator to utilize superheated steam without pressurizing the main steam line.
