

Steam Plants

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The intermediate pressure bleed steam system, shown in the illustration, is used to supply steam at approximately _____ . Illustration SG-0024

67.0 psig

Illustrations: SG0024_WM_100218

According to the illustrated diagram, what is the normal source of heat for the boiler air heaters when the vessel is underway under full power? Illustration SG-0024

Intermediate pressure bleed steam.

Illustrations: SG0024_WM_100218

According to the illustrated diagram, what is the normal source of heat for the first stage feed heater and the distilling plants when the vessel is underway under full power? Illustration SG-0024

Low pressure bleed steam.

Illustrations: SG0024_WM_100218

The auxiliary exhaust system shown in the illustration can be supplied by steam from the _____ . Illustration SG-0024

IP bleed system

Illustrations: SG0024_WM_100218

Which of the labeled items within the illustrated steam drum helps prevent surging of water within the drum as a vessel pitches? Illustration SG-0011

M

Illustrations: SG0011WM_OLD

Which of the labeled items within the illustrated steam drum represents the last line of defense in helping to prevent moisture carryover into the saturated steam leaving the steam drum? Illustration SG-0011

C

Illustrations: SG0011WM_OLD

Which of the labeled items within the illustrated steam drum represents the means by which floating impurities are removed from the steam drum? Illustration SG-0011

E

Illustrations: SG0011WM_OLD

Which of the labeled items within the illustrated steam drum represents the means by which water treatment chemicals are introduced into the steam drum? Illustration SG-0011

L

Illustrations: SG0011WM_OLD

Which of the labeled items within the illustrated steam drum represents the means by which feed water is introduced into the steam drum? Illustration SG-0011

B

Illustrations: SG0011WM_OLD

Which of the labeled items attached to the top of the illustrated steam drum represents the means by which saturated steam is delivered to the superheater? Illustration SG-0011

D

Illustrations: SG0011WM_OLD

What statement is true concerning the illustrated boiler saddle, support and foot? Illustration SG-0015

The illustrated foot is the sliding foot located underneath the front of the water drum.

Illustrations: SG0015_WM_100218

In the illustrated exploded view of a pivoted shoe thrust bearing, identify the base ring _____.

I

Illustrations: SE0014_WM_OLD

What type of bearing is shown in the illustration? Illustration SE-0017

Precision insert, split-half journal bearing

Illustrations: SE0017_WM_100118

What is the name of the nozzle which is associated with the steam drum and is shown in the illustration? Illustration SG-0006

Feed inlet nozzle

Illustrations: SG0006_WM_100218

When used for the purpose of controlling the temperature of main steam, what is the source of water and steam for the illustrated device? Illustration SG-0013

The source of water is feed water and the source of steam is the superheater outlet.

Illustrations: SG0013_WM_100218

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

7

Illustrations: SG0003_WM_070221

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

1

Illustrations: SG0003_WM_070221

As shown on the illustrated sootblower diagram, how is the soot blower element rotated? Illustration SG-0023

Manually operated with an endless chain.

Illustrations: SG0023_WM_100218

As shown on the illustrated soot blower diagram, what item is responsible for opening and closing the steam admission poppet valve at the appropriate times during element rotation? Illustration SG-0023

7

Illustrations: SG0023_WM_100218

Which of the following labeled items of the illustrated air register and burner assembly represents the poke hole cover and would be temporarily removed to poke through a clinker? Illustration SG-0016

13

Illustrations: SG0016_WM_070221

Which of the following labeled items of the illustrated air register and burner assembly represents the mechanism for operating the register air doors? Illustration SG-0016

12

Illustrations: SG0016_WM_070221

Which of the following labeled items of the illustrated air register and burner assembly represents the means by which the flame may be visually checked for color and condition? Illustration SG-0016

14

Illustrations: SG0016_WM_070221

What size drill is used to drill the orifice of the sprayer plate of the illustrated atomizer? Illustration SG-0022
number 38 drill bit

Illustrations: SG0022_WM_100218

Why are two fuel oil heaters "E" provided in the fuel oil system shown in the illustration? Illustration SG-0009
To provide a backup in case one of the heaters becomes inoperable.

Illustrations: SG0009_WM_100218

According to the illustrated auxiliary steam and HP bleed steam system diagram, what are the characteristics of the steam supplied to the main feed pump drive turbines? Illustration SG-0005
850 psig desuperheated steam

Illustrations: SG0005_WM_100218

According to the illustrated auxiliary steam and HP bleed system diagram, what steam loads are supplied by the same steam pressure reducing station? Illustration SG-0005
Main boiler burner steam atomizers and turbine gland seal regulators

Illustrations: SG0005_WM_100218

According to the illustrated steam and HP bleed system diagram, which steam pressure reducing station has the lowest set point? Illustration SG-0005
Tank cleaning seawater heater

Illustrations: SG0005_WM_100218

According to the illustrated diagram, what statement is true concerning the operation of the "make-up valve"? Illustration SG-0010
The "make-up valve" opens when the level in the main condenser hot well drops to a certain level and allows make-up water to be drawn out of the distilled water tank via vacuum drag into the main condenser.

Illustrations: SG0010_WM_100218

According to the illustrated diagram, what statement is true concerning the operation of the main condenser hotwell level control device? Illustration SG-0010

The main condenser hotwell level is controlled by throttling the flow in a recirculating line teed off the main condensate pump discharge line and leading back the main condenser.

Illustrations: SG0010_WM_100218

According to the illustrated diagram, what is the correct sequential order of heat exchangers that the main condensate pump pumps condensate through? Illustration SG-0010

Main air ejector condenser, gland exhaust condenser, first stage feed heater, deaerating feed tank.

Illustrations: SG0010_WM_100218

The unit shown in the illustration is used as the _____. Illustration SG-0025
combined low pressure feed heater

Illustrations: SG0025_WM_100218

See REF2385

The connections labeled "A" in the illustration, are used to _____. Illustration SG-0025
maintain a vacuum in the shell of the feed water heater

Illustrations: SG0025_WM_100218

See REF2385

The upper section of the feedwater heater indicated by "G" in the illustration is used as the _____. Illustration SG-0025
first stage heater

Illustrations: SG0025_WM_100218

See REF2385

A slight vacuum is maintained in the shell of the first stage heater shown in the illustration. The primary reason for the vacuum is to _____. Illustration SG-0025

maintain a positive flow of steam as supplied by the main engine LP bleed system

Illustrations: SG0025_WM_100218

See REF2385

Which of the following statements is correct concerning the operation of the level or drain regulator associated with the feed water heater shown in the illustration is correct? Illustration SG-0025

The regulator controls the level of condensate collected in the drain cooler section.

Illustrations: SG0025_WM_100218

See REF2385

What is the purpose of the item labeled "nozzle" located on the illustrated steam turbine? Illustration SE-0003

Convert the potential energy of the supply steam to kinetic energy.

Illustrations: SE0003_WM_080621

What is the purpose of the items labeled "moving blades" located on the illustrated steam turbine? Illustration SE-0003
Convert the kinetic energy of the steam exiting the nozzle to mechanical energy of rotation.

Illustrations: SE0003_WM_080621

According to the illustrated lubricating oil system diagram, which of the labeled items is the lube oil renovating tank?
Illustration SE-0011

A

Illustrations: SE0011_WM_030619

According to the illustrated lubricating oil system diagram, which of the labeled items is the lube oil sludge tank? Illustration SE-0011

K

Illustrations: SE0011_WM_030619

According to the illustrated lubricating oil system diagram, which of the labeled items is the lube oil gravity tank? Illustration SE-0011

C

Illustrations: SE0011_WM_030619

According to the illustrated lubricating oil system diagram, which of the labeled items would be used to manually strip out the sludge from the bottom of the main lube oil sump prior to entry for cleaning? Illustration SE-0011

N

Illustrations: SE0011_WM_030619

According to the illustrated lubricating oil system diagram, which of the labeled items would be used to verify that the gravity lube oil tank is full and overflowing? Illustration SE-0011

D

Illustrations: SE0011_WM_030619

What statement is true concerning the illustrated steam turbine bearing lubricating oil flow and temperature indicating device? Illustration SE-0010

The thermometer indicates the temperature of the oil leaving the bearing and the sight glass indicates the flow of the oil leaving the bearing as well.

Illustrations: SE0010_WM_100118

What type of thrust is the bearing shown in the illustrated steam turbine shaft bearing designed to absorb? Illustration SE-0007

Axial thrust only

Illustrations: SE0007WM_100118

According to the illustrated cross-compounded main propulsion turbine set, where are the astern elements located? Illustration SE-0016

Forward end of the low pressure turbine.

Illustrations: SE0016_WM_100118

What is the name of the device pictured in the illustration? Illustration SE-0001

Gear type flexible coupling

Illustrations: SE0001_WM_100118

The component shown in the illustration, labeled "I", is the _____. Illustration SE-0013
first reduction gear

Illustrations: SE0013_WM_100118
See REF2354

The component shown in the illustration, labeled "IV", is the _____. Illustration SE-0013
bull gear

Illustrations: SE0013_WM_100118
See REF2354

The item shown in the illustration is commonly identified as a _____. Illustration GS-0124
bowl type purifier

Illustrations: GS0124_WM_092618

As shown on the illustrated huddling chamber type safety valve drawing, what item is associated with setting the blow down adjustment? Illustration SG-0018

B

Illustrations: SG0018_WM_100218

As shown in the illustration, live steam is supplied to the gland seal regulator via _____. Illustration SE-0019
line "C"

Illustrations: SE0019_WM_100218

For the gland seal regulator shown in the illustration, an increase in gland seal pressure will result in _____. Illustration SE-0019

piston "F" moving upward to shut the makeup steam valve "B" and open the exhaust valve "E"

Illustrations: SE0019_WM_100218

Makeup feedwater is brought into an operating closed feed system via the _____.
condenser vacuum drag line

See REF2433

Clean, low pressure steam drains are collected in the _____.
atmospheric drain tank

See REF2388

High pressure steam drains are normally discharged to the _____.

DC heater

See REF2396

When operating with the auxiliary feed line, feedwater flow is controlled _____.
manually by throttling the auxiliary feed stop-check valve

Which of the following conditions is indicated by oil flowing through a lube oil gravity tank overflow sight glass?
Sufficient oil flow is being supplied to the gravity tank.

Where do fuel oil vapors tend to accumulate in an engine room?
In the lower engine room spaces, especially in the bilges.

The purpose of the steam control valves installed in the auxiliary exhaust line is to _____.
control steam admission and maintain the proper steam spray pattern in the DC heater

When a sudden increase in pressure occurs in a forced lubrication system, you should check for a _____.
loss of oil flow across one of the bearings

Prior to relieving the watch you should first check the fireroom status by verifying the boiler steam drum level and _____.
inspecting the fires and burners

Zincs are installed in the main and auxiliary condenser water boxes to _____.
reduce the effects of electrolysis
See REF2222

The atmospheric drain tank (ADT) normally drains to the _____.
main and/or auxiliary condenser

Cooling water to the vent condenser in a DC heater is supplied by the _____.
main and/or auxiliary condensate pump

Which system should be used when required to raise the water level in an idle boiler?
Main feed system

During high speed operation of the main turbine propulsion unit, the heat absorbed by the lubricating oil is removed by the _____.
lube oil cooler

In which of the listed components is chemical energy converted to thermal energy with regards to boiler operation?
Furnace

When blowing tubes, what is the determining factor in deciding how many revolutions of rotation of a soot blower element are required?
When the smoke indicator (periscope) shows clear.

The source of metal particles adhering to the magnets in a lube oil strainer is probably from the _____.
reduction gears

To properly remove the burner tip nut from the burner barrel, the barrel should be _____.
held by the fixture on the burner cleaning bench

Which statement listed represents a vital function of the main condenser?
The recovery of feed water for reuse.
See REF2383

In the condensate system, the automatic recirculating valve can be actuated by the _____.
condensate temperature

After the steam leaves the low pressure turbine, it enters the _____.
main condenser
See REF2437

Under EMERGENCY operating conditions, the proper valve positions for controlling feedwater to the boiler should be the _____.
auxiliary stop valve fully open and the auxiliary stop-check valve used to regulate the amount of flow

The lube oil coolers installed in a gravity lubricating oil system are located between the _____.
lube oil pumps and gravity tanks

The steam drum in a D-type marine boiler _____.
provides a space for moisture to separate from the steam
See REF2438

An efficient seal is normally obtained between the upper and lower halves of a turbine casing by _____.
precision metal-to-metal contact

When blowing tubes on an integral superheat boiler fitted with an economizer, the operating sequence to be followed is recommended by the manufacturer. What section of the boiler is generally blown first and last?
Economizer section

The best indication that a bearing is being properly lubricated is by the _____.
oil temperature indicated by the bearing thermometer

Which of the conditions listed would indicate a dirty fuel oil strainer?
Decreasing fuel oil pressure at the burner manifold

Which of the condensers listed is cooled by sea water?
Main condenser

The automatic recirculating valve in the main condensate recirculating line is controlled by a temperature sensor which is located at the _____.
air ejector condensate discharge

Babbitt is a metal alloy commonly used for lining _____.
precision bearings
See REF2353

The main feed check valve functions to _____.
prevent backflow of water from the boiler in the event of a feed pump failure

In a pressure type main propulsion turbine lubrication system, the lube oil service pumps normally take suction from the main sump and discharge directly to the _____.
lube oil coolers

In a single furnace boiler, where is the steam typically cooled for use as auxiliary steam?
Desuperheater
See REF2439

When performing a bottom blow on a boiler, what valve is spun open quickly?
Guarding valve (second valve away from the water drum).

A poorly cleaned lube oil purifier bowl may result in _____.
improper separation
See REF2441

If you noted a large difference in the pressures indicated by a duplex pressure gage to the fuel oil system strainer, you should _____.
shift to a clean fuel oil strainer

Most auxiliary turbine feed pumps do not require an external source of gland sealing steam because they _____.
exhaust to pressures above atmospheric pressure

While underway, vacuum in the main condenser is primarily caused by the _____.
condensing of the exhausting steam

Which of the following types of bearings are used as line shaft bearings?
Ring-oiled, Babbitt-faced, spherical seat, shell

In addition to sensing steam drum water level, what additional sensing input does a two- element feed water regulator control system utilize?
Boiler steam flow

Lube oil is preheated before centrifuging in order to _____.
improve purification
See REF2357

Which of the devices listed is found on an LP main propulsion steam turbine casing?
Sentinel valve

When performing a periodic gauge glass blow down to insure that the glass is free and operating correctly, what action is performed first?
Close the top shut off valve and open the drain valve to clear out the bottom connection to the gauge glass.

The astern guarding valve on main propulsion steam turbine units must be open when a vessel is _____.
maneuvering into port

During the routine inspection of an operating centrifugal lube oil purifier, you notice oil discharging through the water discharge port. Which of the following actions should be taken?
Add water to seal the bowl.

If water hammer develops while opening the valve in a steam line, which of the following actions should be taken?
Shut the steam valve at once, open the drain valves until all moisture is drained, shut the drain line valves, and slowly open the steam valve again.
See REF2410

Most auxiliary turbine feed pumps do not require an external source of gland sealing steam because they _____.
exhaust to pressures above atmospheric pressure

A main condenser utilizing a scoop for the circulation of sea water must be constructed as a _____.
single-pass heat exchanger
See REF2384

As found in a reduction gear drive system, thrust bearings serve to _____.
transmit the force produced by the propeller to the structure of the ship

Which of the following statements about boilers is correct?
A hot boiler will continue to generate steam after the fires are secured.

In a disk type centrifugal purifier, the bowl is mounted on the upper end of the _____.
bowl spindle

The adjustable spherically seated self-aligning bearing housings used in main turbines are provided with oil deflector rings. The function of these rings is to _____.
prevent the external leakage of oil out of the bearing housing

When placing a cleaned and properly made up atomizer in the spare atomizer rack, how should the atomizer be stored?
The atomizer should be stored vertically with the atomizer cap nut pointing downward.

During normal operation of a main propulsion turbine, the lube oil supply temperature to the bearings should be maintained at approximately _____.
120°F

A centrifugal oil purifier should be shut down if the _____.
purifier is vibrating badly

Water boxes on main condensers are vented to _____.
liberate air pockets and reduce waterside oxidation

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

After a boiler has been taken off the line and is cooling, the air cock is opened to _____.
prevent the formation of a vacuum within the boiler

The dirty oil inlet on centrifugal lube oil purifiers is located at the _____.
bottom of the tubular bowl type

The jacking gear must be engaged as quickly as possible when securing the Main Turbines in order to _____.
prevent uneven cooling of the turbine rotors
See REF2378

When cleaning boiler fuel oil atomizer parts, what type of cleaning tool should NEVER be used?
Steel tools

While a vessel is underway, one of the FIRST indications of the failure of the gland leakoff exhaust fan motor is _____.
excessive steam leakage at the turbine glands

Which of the conditions listed should be immediately reported to the engineering officer on watch?
Oil in the drain inspection tank.

The constant pressure governor of a turbine-driven feed pump maintains which of the following pressures at a constant value for all capacities?
Pump discharge

Air in the main condenser is harmful because it will _____.
decrease the vacuum in the main condenser
See REF2434

Which of the pumps listed operates at constant speed and delivers water to the deaerating feed tank at a nearly constant pressure?
Main condensate pump

Which of the valves listed should be closed before lighting off a boiler?
Economizer drain valve

Which of the listed conditions aids in directing gland leakoff steam from the low pressure propulsion turbine to pass through the gland exhaust condenser?
The use of a gland exhauster fan.

The jacking gear on main propulsion turbines can be used to _____.

provide reduction gear tooth inspection

See REF2378

In terms of the completeness of combustion, in viewing the condition of the stack, what would be the indication of the MOST complete combustion and HIGHEST boiler efficiency?

Light brown haze

An overheated bearing in the main propulsion unit is indicated by _____.

high temperature of the lube oil leaving the bearing

Serious tube leaks in the air ejector after condenser assembly may cause _____.

an overflow of the atmospheric drain tank

See REF2442

What is the normal destination of steam exiting a main feed pump drive turbine?

Dearating feed tank via the auxiliary exhaust steam line.

Under normal conditions, the rate of heat transfer in a feedwater heater is most greatly affected by the _____.

temperature differential between the steam and feed water

In a main propulsion steam turbine installation, the condensate pump initially discharges to the _____.

air ejector condenser

See REF2387

While raising steam on a cold boiler, the air cock is to be closed after _____.

steam has formed and all air is vented

Which of the filter/strainer units listed permits you to clean the element while leaving the system on the line?

Duplex

Gland sealing steam is used during steam turbine operation to prevent the loss of _____.

vacuum

What statement is true concerning a propulsion steam turbine turning (jacking) gear?

The jacking gear splined clutch is associated with the high pressure turbine first reduction pinion.

In terms of the completeness of combustion, in viewing the condition of the stack, what would be the indication of the LEAST complete combustion and LOWEST boiler efficiency?

Black smoke

While making your rounds, you notice the main lube oil temperature to be higher than normal. To remedy this situation, you should _____.

increase the opening of the lube oil cooler seawater discharge valve

If the boiler water and condenser hot well levels are normal, but the DC heater level is only 30% of full, you should _____.

open the makeup feed

See REF2443

An excess pressure governor is a special type of control device which would normally be found on a _____.

turbine-driven feed pump

What is the source of heat for a third stage feed heater (if fitted) while a vessel is underway under full load?

High pressure bleed steam

Which of the devices listed is commonly used to compensate for the expansion and minor misalignments occurring between the main turbine rotor and the reduction gear?

Gear type flexible coupling

When raising steam on an idle boiler and the steam pressure has risen to about 5 pounds more than the pressure of the boiler already on the line, you can _____.

put the boiler on the line

As the speed of an oil lubricated ball bearing increases, fluid friction, due to churning, generates heat. This condition may be avoided by _____.

reducing the quantity of lubricant until only a mist of oil is present on the ball bearings

The main turbine gland sealing system is designed to _____.

seal the turbine shaft against air leakage into the turbine casing

allow minimal steam leakage out of the gland

regulate steam pressure to the glands when the main turbine is operating at reduced speeds

All of the above.

What statement concerning the operation of a propulsion steam turbine turning (jacking) gear is true?

The turning gear is used to prevent turbine rotor distortion while warming-through or while cooling, since distortion is an issue when warming-through or cooling.

In terms of the diluting effect of excessive excess air, when viewing the flame through a peephole, what would be the indication of the greatest diluting effect with far too much excess air?

Dazzling white flame

Lube oil temperature leaving the lube oil coolers is regulated by throttling the _____.

cooling water outlet valve

See REF2369

Excessive water loss from the main feed system can be caused by _____.

an atmospheric drain tank trap frozen in the closed position

The safety device provided on a turbo generator which closes the throttle automatically when the cooling water to the condenser is insufficient is called a/an _____.

back pressure trip

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

contaminated drain system

See REF2435

Which of the following precautions should be taken prior to lighting off a boiler?

Purge the furnace of combustible gases.

Magnets are installed in the main propulsion turbine lube oil strainers to attract metal particles released through wearing of the _____.

reduction gears

Under what circumstances would a propulsion steam turbine turning (jacking) gear most likely be used?

Warming-through the main turbines prior to maneuvering.

By which of the listed methods may heat be transferred from one body to another?

- Radiation**
- Convection**
- Conduction**
- All of the above.**

See REF2440

A lube oil sample is taken from the main engine lube oil system and visually inspected. Which of the following would indicate water contamination?

- A milky-white color**

Salt water contamination of condensate could occur at which component?

- Fresh water evaporator**

A back pressure trip on a ship's service turbo-generator functions to trip the turbine under what circumstance?

- amount of cooling water to the condenser is insufficient**

Which statement is true concerning drain inspection tanks?

- Inspection tanks provide for a visual examination of condensate which could be oil contaminated.**

Which of the following methods is used to lubricate main propulsion turbine reduction gears?

- Oil is sprayed through nozzles at the point of gear mesh.**

In what part of a main boiler fuel oil service system is it permissible to raise the temperature of the fuel above the flash point?

- Between the fuel oil service heater and the boiler burner atomizers.**

Which of the following statements is correct concerning heat transfer?

- Heat transfer rate is affected most by the temperature difference between the heat source and the heat sink.**

In a gravity type lube oil service system, if no lube oil appears in the sight glass of the return drop line while underway, this is a positive indication that _____.

- no oil is overflowing from the gravity tank**

See REF2369

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

- Closing the water seal line to the packing gland.**

Air accumulated in the inter condenser of the air ejector assembly is discharged directly to the _____.

- after condenser**

See REF2381

If live steam is supplied directly to the tank heating coils, the collected drains in the "clean" section of the contaminated drain inspection tank are removed directly to the _____.

- atmospheric drain tank**

See REF2436

Fuel oil settling tanks are used to _____.

- store oil for immediate use**
- precipitate out water and solids**
- facilitate the stripping of sludge and water**
- All of the above.**

Concerning the classification of steam turbines, a cross compound designed unit _____.

- consists of a high pressure turbine, crossover pipe, and low pressure turbine**

When transferring fuel from a fuel storage tank to a fuel oil settling tank, what is the best protection against an oil spill?
Sounding the settling tank more often as the level rises and stopping the transfer before completely filling the tank.

Which of the following modes of heat transfer does NOT require any physical contact between a warmer and a cooler substance?

Radiation

Excessive water in an operating lube oil system can be detected by _____.
the amount of water discharging from the lube oil purifier

If the condensate level in the loop seal of the air ejector inter condenser is lost, _____.
air will be drawn back into the main condenser

See REF2444

The cooling water flow from an air ejector inter condenser and after condenser is discharged directly into the _____.
condensate and feed system

See REF2387

Which of the listed components would be considered the dividing line separating the condensate system from the feed water system?

Deaerating feed tank

The main reason for having a low suction line on the fuel oil service or settling tanks is to _____.
facilitate water removal

In a cross-compounded turbine propulsion plant, steam enters the _____.
high pressure unit and then flows through a crossover to the low pressure unit

What method of burner light-off presents the greatest danger to boiler flareback?
Lighting-off from hot brick work.

The maximum temperature rise of oil passing through any reduction gear set, or bearing, should not exceed _____.
50°F (27.8°C)

Excessive recirculation of condensate should be avoided, as it can cause _____.
excessive cooling of the condensate

Which statement is true concerning two-stage air ejector assemblies?

The steam/air mixture from the main condenser is discharged by the first stage air ejector to the inter condenser.

The DC heater functions to _____.

remove air from feed water

heat feed water

store feed water

All of the above.

The pressure in the feedwater system must exceed boiler steam drum pressure in order to _____.
force the feed water into the boiler

Which of the following statements about gravity type lube oil systems is correct?

Gravity tank overflow lines are lead directly to the lube oil sump.

Steam supplied to the main propulsion turbines is _____.
superheated steam

Prior to initial light-off of an idle boiler, what must first be done to prevent boiler flareback?
The furnace must first be purged of combustible vapors with the forced draft blower while the air register doors are open.

On a ship equipped with a gravity type lube oil system, which of the conditions listed will occur FIRST if the main lube oil pump discharge pressure is lost?
An alarm will sound.
See REF2369

Which of the actions listed should be carried out immediately after securing the fires in one boiler of a two boiler ship?
Relieve all fuel oil service pressure to that boiler.

While vacuum is being raised on the main unit and the turbine warmed, condensate is recirculated to the main condenser to _____.
ensure the condensation of air ejector steam

High pressure and low pressure drain systems are part of the _____.
condensate drain system

The DC heater automatic level dump valve is used to _____.
drain excess feed water to the distilled water tank

To prevent pulsations from developing in the boiler feedwater lines, the discharge side of a reciprocating feed pump is equipped with a/an _____.
air chamber

The gravity tank in a gravity lube oil system serves to _____.
maintain oil supply for several minutes to bearings should the lube oil service pump fail
See REF2369

Which statement is true concerning the operation of item 12 on the illustrated air register and burner assembly? Illustration SG-0016
The air register doors should be fully open for an individual burner that is lit and fully closed for an individual burner that is idle.

On a main propulsion turbine set of a merchant ship, where is the astern staging generally located?
Within the low pressure turbine

Fuel piping should be regularly inspected for leaks. What leak location would be particularly troublesome in terms of presenting a fire hazard?
Fuel oil service pump discharge strainer.

While a vessel is underway, which of the conditions listed would indicate a leak in the lube oil cooler?
Excessive lube oil consumption.

If the water level in a steaming boiler is dropping rapidly and cannot be kept at the normal level by standard practices, you should _____.
secure the fires and then secure the steam stop

REF2222

Zinc anodes are installed in water cooled Condensers to prevent electrolysis. Zinc Anode means: A piece of zinc metal that attracts negative electric charges. Electrolysis = corrosion caused by the flow of electric current. Zinc, when used as a sacrificial anode, reduces and controls electrolysis (i.e., electrolytic action) in a heat exchanger.

REF2353

Babbitt is a metal alloy commonly used for bearing surfaces, particularly for lining precision insert bearings

REF2354

An Articulated Double Reduction Gear for a cross-compounded turbine has four pinions (small gears).

REF2357

Lube oil should be hot to lower its viscosity (i.e., thickness) to insure efficient filtering.

REF2369

A gravity lube oil system has a "gravity tank" located high in the fidley. This height provides the pressure head needed to lubricate the bearings. The lube oil service pump moves the oil up to this tank and keeps it full. An overflow line passes excess oil from the gravity tank to the sump. This overflow line has a large sight glass (i.e., a bull's eye) in a location easily viewed from many locations. Any flow that passes the bull's eye indicates that the tank is full. If the lube oil service pump fails, it will cause the overflow to stop. However, the tank holds enough oil to provide oil to the bearings for several minutes after the pump stops. Meanwhile, an alarm will sound as soon as the pump loses its discharge pressure.

REF2378

To avoid damaging the turbine, disengage the Jacking Gear before admitting steam to the turbine.

REF2381

Air in the After condenser is led out to the atmosphere.

REF2383

One vital function of the main condenser is to condense the steam exhausted from the LP turbine and return the condensate to the feedwater system via the main condensate pump.

REF2384

In a single-pass main condenser, the temperature of the cooling water should increase approximately 10 ■ F while it passes through the condenser.

REF2385

A feedwater heater is a power plant component used to pre-heat water delivered to a steam generating boiler. Preheating the feedwater reduces the irreversibilities involved in steam generation and therefore improves the thermodynamic efficiency of the system.

REF2387

The cooling water for the Intercondenser and Aftercondenser of the Air Ejector is the condensate from the Hot Well. This is discharged into the condensate and feed system.

REF2388

Reference: NAVPERS 10788B, Principles of Naval Engineering, Page 220

REF2396

High pressure steam drains normally discharge to the DC heater.

REF2410

Water hammer (or, more generally, fluid hammer) is a pressure surge or wave caused when a fluid (usually a liquid but sometimes also a gas) in motion is forced to stop or change direction suddenly (momentum change).

REF2433

Makeup feedwater is brought into a closed steam system through the Vacuum Drag Line to the Main Condenser. When you cannot maintain the proper level in the deaerating feed tank, bring feed water into the main condenser through the

vacuum drag line.

REF2434

Any air trapped in the main condenser will prevent a vacuum from forming.

REF2435

Return lines from tank heating coils lead to the contaminated drain system (i.e., the drain inspection tank) where visual inspection can determine if the water is contaminated by oil.

REF2436

The atmospheric drain tank receives drains from the fuel oil inspection tank.

REF2437

Steam from the low pressure turbine goes to the Main Condenser.

REF2438

D-type Boiler It is used in both stationary and marine applications. It consists of a large steam drum vertically connected to a smaller water drum (a.k.a. "mud drum") via multiple steam-generating tubes. These are surrounded by walls made up of larger water-filled tubes, which make up the furnace.

REF2439

Other uses of a desuperheater include providing steam to various auxiliary equipment aboard ship.

REF2440

How is heat transferred? Heat can travel from one place to another in three ways: Conduction, Convection and Radiation. Both conduction and convection require matter to transfer heat. If there is a temperature difference between two systems heat will always find a way to transfer from the higher to lower system. CONDUCTION-- Conduction is the transfer of heat between substances that are in direct contact with each other. The better the conductor, the more rapidly heat will be transferred. Metal is a good conduction of heat. Conduction occurs when a substance is heated, particles will gain more energy, and vibrate more. These molecules then bump into nearby particles and transfer some of their energy to them. This then continues and passes the energy from the hot end down to the colder end of the substance. CONVECTION-- Thermal energy is transferred from hot places to cold places by convection. Convection occurs when warmer areas of a liquid or gas rise to cooler areas in the liquid or gas. Cooler liquid or gas then takes the place of the warmer areas which have risen higher. This results in a continuous circulation pattern. Water boiling in a pan is a good example of these convection currents. Another good example of convection is in the atmosphere. The earth's surface is warmed by the sun, the warm air rises and cool air moves in. RADIATION-- Radiation is a method of heat transfer that does not rely upon any contact between the heat source and the heated object as is the case with conduction and convection. Heat can be transmitted through empty space by thermal radiation often called infrared radiation. This is a type electromagnetic radiation. No mass is exchanged and no medium is required in the process of radiation. Examples of radiation is the heat from the sun, or heat released from the filament of a light bulb.

REF2441

The upper temperature limit is 180°F for oil discharged from the lube oil purifier bowl. A poorly cleaned lube oil bowl may result in improper separation of oil and solids from the oil.

REF2442

Original Question: 254213-1 Serious tube leaks in the air ejector condenser assembly will cause _____. A. clogged steam strainers B. fouled nozzles C. loss of vacuum D. faulty steam pressure Correct Answer: C Replacement Question: 254213-2 Serious tube leaks in the air ejector after condenser assembly may cause _____. A. clogged steam strainers Incorrect Answer: tube leaks occurring in the after condenser will have no effect on the steam strainers of the steam line to the air ejector nozzles B. fouled nozzles Incorrect Answer: fouled nozzles would be caused by defective steam line strainers in the steam line to the nozzles. C. an overflow of the contaminated drain inspection tank Incorrect Answer: the steam condensed from the first stage air ejector nozzle in the inter condenser is directed to the main condenser and the condensed steam from the second stage nozzle in the after condenser is directed to the ADT. None of the air ejector drains are directed to the contaminated drain tank. D. an overflow of the atmospheric drain tank Correct Answer: the after condenser normally condenses steam from the second stage nozzle and directs the condensate by gravity to the Atmospheric Drain Tank. A serious after condenser tube leak in this area may cause the ADT to overflow due to the increase in flow to the ADT as well as cause possibly flooding in the after condenser resulting in steam discharging from

the vent due to the decreased cooling surface area in the after condenser.

REF2443

If the boiler water and condenser hot well levels are normal but the DC Heater level is low, add water by opening the makeup feed line.

REF2444

If the Loop Seal (a "water-sealed loop") is lost, air will enter the Main Condenser. To reestablish the Loop Seal, momentarily close and slowly reopen the valve in the Loop Seal line.

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