

Orals Questions

Examiner: Michael Greenwood

Asked to see my passport, asked for me to show my screen. Then asked me to show him the room to make sure there was no one in the room and the door.

Tell me a bit about yourself, what ships you been on.

Work with carnival, ive been on Azura, Queen Victoria and the Aurora for a short trip

What type of propulsion where these ships

Azura and Aurora where PEMs and Queen Victoria was Azipods

What type of engines where on the ships

M.A.N on aurora and Wartsilla on Azura. Queen Victoria had Sulzer engines which where pretty cool and had the rotating piston crown.

Okay, where the ships hi-voltage

Yeah

So you haven't been on any slow speed 2stroke engines ?

No never

Okay.. right first thing were going to talk about is slow speed two stroke engines. So let me share my screen with you. Right you should see a 2 stroke engine.

Shared a picture of a MAN 2 stroke engine with half the engine cut out so you can see inside the combustion space and crankcase ETC



Circled certain parts of the engine and asked me to identify what they are.

Piston rod

Scavenge ports

Stuffing box, whats the purpose of it?

Stop the mixing of the lube oil and avoid gasses into the crankcase from combustion, if there's blow by the piston rings. Probed for more information. I said to stop the scavenge are getting into the crankcase.

What sort of pressure do you think our scavenge air would be?

Before its compressed it would be about 1 bar

Yeah, okay

And where is that scavenge air pressurised, how does it get pressure.

By the turbocharger, or the auxiliary blowers

Okay yeah, when do we use an auxiliary blower?

When the engine is operating at low load and there isn't enough exhaust gas to drive the turbocharger.

Circled cross head and guide

Whats the purpose of the guides then?

(stumbled on my words and was about to say guide the cross head, but didn't)

As the piston is moving down on the power stroke, it turns the longitudinal forces into rotational forces into the main journal

Okay

Circled the exhaust manifold- whats this then?

Stumbled with my words and said scavenge space.

After a bit of probing I said its the exhaust manifold.

Pointed to the exhaust valves,

I said the outlet exhaust valve,

He was just looking for exhaust valve.

What opens these exhaust valves ?

I said Air, Nope try again

Hydraulics?

Yeah okay fine, its difficult because you've never seen one its okay, you've only seen what you've seen at the end of the day.

Drew a circle around the Turing Gear but I couldn't make out what it was. Told me we would come back to it. (when I was talking about getting the engine ready for Departure he looped back to this question and we had a bit of a laugh at how stupid I was for not getting it)

Then shared another picture of a 4 stroke engine.

How do we know this is a 4 stroke engine?

Theres no cross head guide

Why don't we have a cross head guide, how does the forces transfer

Because we have the gudgeon pin

Whats this? (point to the Relief valves)

None-return, explosion relief valves

Whats this ?(rocker box)

Whast in the Rocker box?

Rocker arms

What the purpose of the rocker arms? How do they work?

Whats this thing round here?

High Pressure Fuel pump

What do we call this?

Bottom end bearing

Whats this?

Counter weight

Okaydoky, stop sharing this.

Do you have a piece of paper there? can you draw me a 4-stroke timing diagram, nothing fancy just the main parts

Inlet stroke, Compression stroke, Expansion stroke, Exhaust stroke

Okay you're a 4th engineer on a argo ship with a large 2 stroke engine, ships in port, its an hours' notice before departure, walk me through your checks.

Call the chief

Start additional Geny for thrusters

Under solas ch5 reg 26 the steering gear needs checked 12hrs before departure. Once in the steering gear room I would call the bridge on the emergency phone telling them im doing steering checks and give them my gyro reading. this also checks the emergency phone works.

I would check the low level alarms on the hydraulic pack

I would check the local control at the pumps for the steering gear ensure there both working independently, I would check the independent power supply by tripping the breaker and ensuring there's still power to one pump.

I would then test the rudder angle 35to30 in 28S. put pumps back into remote control. Call the bridge again tell them I'm ready for them to do there checks. I would call out every 5° so the bridge knew the rudder angle was correct.

Continue my round and head to the air receiver, drain the water from the receivers. Making sure the receiver bottles are full, there should be enough air to start a CPP engine 6 times and a reversible engine 12 times.

Checking over the compressors ensuring the bursting disk is okay and there's sufficient lube oil.

I would head to do my main engine checks.

With the Indicator cocks open and Turbocharger drains open, I would engage the turning gear and after checking with the bridge, I would turn the engine one full revolution. While doing this I would watch the motor current look for any spikes indicating a seizure. I would also be watching for any water from the indicator cock. This is to help share the thermal load and ensure the engine is well lubricated.

I would then disengage the TG and open the main start air valve and distribution valve to allow the engine to be turned on air. I would use the slow turn on air local control if available or I would have the ECR kick the engine ahead and astern on air. This proves the engine air system is operating and removes any gases from the cylinder.

Once I'm happy with that I would close the TC drains and Cocks and have the ECR kick ahead and astern on Fuel, proving the fuel system is operational.

I would check the emergency telegraph from the engine room by moving the handle to the light indication. This would be done in the ECR aswell along with the emergency talk back system with the bridge and ECR would be tested.

Once all the checks have been done on the main engine, control would be handed over to the bridge for them to kick ahead and astern.

I would start the EGB circulation pump if it wasn't already running and open the dampers for it, close the bypass.

That pretty much it for departure.

Okay.. quite a lot there. Let take a few steps back.

You started off by saying you would start an auxiliary generator. Talk me through how you would do that? This is an old ship without a PMS. Talk me through doing it manually?

After starting the generator I would walk round checking the temperature and pressure gauges, and ensuring there's no fuel leaks.

I would then head to the switchboard room where the synchroscope is. I would check the incoming generator voltage is the same as the running generator, ensure the frequency is the same. I would check that it is also in phase by making sure the synchroscope is moving in a slow clockwise position. I would then close the breaker at the 11 o'clock position. And then increase the load on the

incoming generator and decrease the load on the already running generator. Sharing the load equally.

How do you increase the load?

The governor control switch (not sure what is called)

Okay so you've started the generator and there's only 400V not 440, what do you think could be the problem there?

Would be a problem with the alternator exciting or the AVR.

What does the AVR do?

Automatic voltage regulator, the engine is supposed to run at a rated voltage so the AVR measures the voltage and excites or deexcites the alternator based on what the voltage is.

When you drain the air receiver where does the water come from?

Why is it a problem?

How do we stop the oil being carried over?

What would you do if you seen water coming out of the indicator cocks when turning the main engine?

Why is water not good coming out of our indicator cocks?

Where would the water come from?

Showed a Jacket cooling water system (with an orifice plate) Asked me what all the stuff was in the system. And what it does

What do you do if there's an OMD alarm?

What causes oil mist?

Where do we get the hot spots?

Bilge alarms in quick succession, what's in the engine room which can deal with a massive ingress of water.

Can we pump bilge straight into the sea?

What boiler fittings did you have?

What would you do if there is no level on the gauge glass and boiler is running?

How do we maintain our boiler water?

What do we test and why?

Why is scale bad?

How to isolate a motor

How to IR test

How to Continuity test

Showed me a Pictor of the termials and asked how its wired (star)

What would you set the mustimeter to prove dead.

Where would you put the probes for an IR and continuity test

Whats the problem with a earth fault on a motor?

Whats the marpol rules for pumping bilge ?

What other marpol annexes

What is ISM

What is SMS

What is ILO

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