Engine room fire caused by failed fuel pipe

The fire alarm suddenly sounded on the bridge. The master was on the bridge and acknowledged the alarm. It was evening and the 2nd officer was the OOW and was asked by the master to check where the alarm had originated from. It came from the engine room and the 2nd officer could see from the bridge that there was smoke coming out from engine room ventilation. The master realized this was not a false alarm and activated the general alarm.

At the same time the chief engineer was in the ECR and also saw the fire alarm. He left the ECR and went to the engine room where he could see smoke and flames by one of the main engines.

He tried to extinguish the fire with a portable fire extinguisher, but the fire was too big and the attempt failed.

He went back to the ECR, called the master and told him that he could not extinguish the fire. The chief engineer left the engine room and proceeded to the muster station.

A fire team suited up to try to extinguish the fire, but when they entered the engine room they realized that the fire had spread as there were large flames and a lot of smoke. The chief engineer told the master that the fire was out of control and the fire team could not fight it.

The master told the chief engineer to release the CO2 as all crew members had been accounted for.

The chief engineer told the master that all fire dampers were closed and that he had activated all the remote quick closing oil valves.

The chief engineer went into the CO2 room and started the required procedures however he missed opening one of the valves for the system. He realized that something was wrong as no CO2 was released into the engine room and started to open the manual valves on the bottles.

However, only 50% of the bottles were released into the engine room using this method as one valve was closed.

The master could see that the smoke decreased for a short time but then picked up again.

He realized that the CO2 had failed to extinguish the fire and ordered abandon ship.

The weather was unfortunately difficult with 4m waves, but the crew managed to abandon ship in two life rafts on the starboard side of the vessel which was a bit calmer.

Before abandoning ship the master had broadcast a Mayday signal. The vessel was in a relative busy area and the crew was rescued within a couple of hours.

The vessel was saved by salvors before grounding and the fire was extinguished.

The survey indicated that seawater had leaked through the middle cross joint drain channel and through the corner of the hatch coamings. ■

Discussion

Go to the “File“ menu and select “Save as...“ to save the pdf-file on your computer.

You can place the marker below each question to write the answer directly into the file.

When discussing this case please consider that the actions taken at the time made sense for all involved. Do not only judge, but also ask why you think these actions were taken and could this happen on your vessel?

1. What were the immediate causes of this accident?

2. Is there a risk that this kind of accident could happen on our vessel?

3. How could this accident have been prevented?

4. What sections of our SMS would have been breached if any?

5. Is our SMS sufficient to prevent this kind of accident?

6. Does our SMS address these risks?

7. If procedures were breached, why do you think this was the case?

8. Do our procedures make sense to the work we actually do?

9. Have we done risk assessments on possible hot spots in the engine room?

10. What are our procedures if we get a fuel oil pressure alarm?

11. If insulation is removed when maintenance is carried out, do we have procedures to ensure that the insulation is put back?

12. Are our firefighting drills effective enough to address the problems in this case?

13. How often do we test the quick closing oil valves?

14. Do we train on how to release the CO2 system?

15. How often do we train on how to release the CO2 system?

16. Do we have any procedures on when to enter a confined space and fight a fire and when not to?

17. What do you think was the root cause of this accident?

Issues to consider

- In the following investigation it was found that some of the emergency quick acting valves were not properly closed.
- The investigation also found that the fire had started because a fuel pipe broke. This caused hot oil to spray into the engine room. When the hot oil hit a hot spot, it ignited and the fire started.
- A loss of fuel oil pressure alarm most be investigated at once to ensure no pipe has failed.
- It is important to have inspections of the fuel lines included in the PMS.
- Many fires are caused by hot spots not being covered by the required insulation which might have been removed during maintenance. It is essential that the crew ensure that insulation is put back and that hot spots are identified in the engine room to prevent fires, and insulated as required. This should also be included in the PMS and risk assessment.