

Miðvágur 20 juni 2012

MV Varðborg



Marine Casualty Investigation report

Fire onboard fishing vessel “Varðborg”.

This report is based upon information from following parties:
The Captain MV Varðborg - The Chief Engineer MV Varðborg - The Owners MV Varðborg
– The webpage of DNV- Skipalistin

Investigation of Maritime Accidents

The Faroese Maritime Authority is responsible for investigating accidents and serious occupational accidents on Faroese merchant and fishing vessels. The Faroese Maritime Authority also investigates accidents at sea on foreign ships in Faroese waters.

Purpose

The purpose of the investigation is to clarify the actual sequence of events leading to the accident. With this information in hand, others can take measures to prevent similar accidents in the future.

The aim of the investigations is not to establish legal or economic liability.

Reporting obligation

When a Faroese merchant or fishing vessel has been involved in a serious accident at sea, the Faroese Maritime Authority must be informed immediately.

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Vessel key information

Ship's Name : Varðborg
Flag : Faroe Islands
Call Sign : XPPI
IMO Number : 5417210
L.o.a : 39,59 m
Beam : 7,03 m
Max Draft : 3,66 m
Owners : P/F O. C. Joensen, Oyri, Faroe Islands.
Management : P/F Thor, Hósvík, Faroe Islands
Class society : Det Norske Veritas (DNV)

Summary

Early morning 01.07.2011 a fire emerged in the engine room of MV Varðborg.

The vessel had departed port of Peterhead, Scotland two hours earlier, and was underway for fishing.

While the engine room suffered material damages, no death, injury or pollution occurred as a result.

Log of events

All time references in UTC

30.06.2011
22:00 MV Varðborg departs port of Peterhead
23:00 Engineer leaves engine room
01.07.2011
00:00 Change of watch. Mate relieving Captain
00:10 Alarm from fire alarm panel navigation bridge
00:10 Start locating the fire
00:12 Engineer reports fire in engine room
00:12 Captain orders all ventilation engine room closed
00:12 Captain orders all crew to be alarmed
00:13 Captain takes over command Navigation Bridge from mate
00:13 Captain orders mate to muster crew, carry out headcount and prepare for abandoning vessel.
00:22 Mate reports all crew mustered; and all ventilation for engine room closed.
00:22 Aberdeen Coast Guard requested for help
00:22 Aberdeen Coast Guard transmits mayday relay
00:22 Emergency stop main engine activated – main engine not stopping.
00:22 Captain orders mate to activate M.E. EMG stop with short intervals.
00:22 Emergency stop auxiliary engines activated – aux stops.
00:22 Blowers engine room stop.
00:22 Quick closing valve day tank remotely closed
00:45 Main Engine stops
00:46 Halon released into engine room
00:50 Two rescue boats from The Scottish Coastguard at the scene
01:26 One Rescue Boat starts towing MV Varðborg
03:44 Arrival Port of Peterhead
05:30 Peterhead Fire Brigade reports fire extinguished.

Narrative

MV Varðborg departed port of Peterhead 30.06.2011 at 22:00 Hrs UTC.
Vessel was underway for fishing fields.

The engineer stayed in the engine room until 2300 Hrs UTC. When he left the engine room, everything was normal. He made his way to the navigation bridge.

Captain and Mate were rotating the bridge watch, 6 hours on and 6 hours off.

Morning 01.07.2011 at 00:00 hrs, the Captain was relieved as OOW by the Mate.

The weather was fine with light southerly winds.

After being relieved, the Captain stayed on the navigation bridge together with the Engineer and OOW.

At 0010 Hrs the fire alarm sounded.

The Engineer immediately made his way to the engine room.

While smoke odour was sensed inside the wheel house, smoke was visually observed astern of the wheel house.

The Captain went out on boat deck to inspect the void space underneath the bridge. Nothing unusual observed.

Then he took his way aft the boat deck, and noticed smoke coming from the aft end of the vessel.

Narrative continued...



Aft end Navigation Bridge, boat deck and main deck.

He went down to the main deck, meeting the engineer, who informed fire was in the engine room.

Captain ordered all ventilation for engine room closed.

On his way back to the navigation bridge he met one crewmember, who was instructed to alarm the entire crew.

Back at the navigation bridge, the Master took over command. He instructed the Mate to muster the crew. As a precautionary measure, he also instructed the Mate to prepare for abandoning the vessel.

The Captain activated the remote emergency stop buttons main engine and auxiliary engines.

Narrative continued...



Emergency Stop panel Navigation Bridge

While the auxiliary engines stopped, the main engine did not stop.

Consequently the engine room blowers stopped.

The Mate returned to the navigation bridge, reporting all men had been accounted for, and all engine room ventilation closed.

Since the main engine did not stop on initial activation M.E. emergency stop button, the Captain instructed the Mate to activate the M.E. emergency stop button, at short intervals. However, without effect. The main engine kept running at 200 to 400 rpm/min.

The Captain then ordered the Mate to close the quick closing valve, leading from day tank to Main Engine.

Narrative continued...

At 0045 Hrs the Main Engine stopped. Shortly after, at 0046 Hrs, the fixed Halon fire-fighting media was released into the engine room.

At 00:50 Hrs two Scottish coastguard vessels arrived at the scene.

At 01:26 Hrs the towing of MV Varðborg was initiated by one of the attending coastguard Vessels.

03:44 Hrs MS Varðborg alongside in Port of Peterhead.

At 0530 Hrs Peterhead Fire Brigade reported the fire extinguished.

Analysis, comments and conclusions



The engine room. Main engine to the right.

The fire

Initially it was believed, the fire was caused by a main engine indication valve loosening and allowing heated fuel to be sprayed out into engine spaces and ignite due contact with hot surfaces.

Self loosening of indication valves is a well known problem, which is mainly caused by temperature changes in the wake of starting up the engine.

In this case, the heating of the main engine after departure Peterhead would have led to the loosening.

Analysis, comments and conclusions continued...

However at later stages the reason for the fire has been assessed to be as follows:

During port stay Peterhead one gasket was replaced in the pipeline between the lubricating oil heat exchanger, and the lubricating oil filter, main engine. This work was carried out by a local service company.

The new gasket was made by cork materiel.

Vessel departed port of Peterhead, and after approximately two hours of main engine operation, a fire broke out in the engine room.

Direct cause of the fire was lubricating oil spraying onto hot surfaces exhaust manifold, engine block and cylinder heads main engine.



M.E. Cylinder head 4 & 5 -and top cover exhaust manifold

Plausible reasons for the oil leak are:

1) Newly installed gasket blown/broken

- a) *The gasket used was made by cork materiel.
Gaskets made by Cork are most likely not thoroughly able withstanding pressure and temperature conditions in mentioned system.*
- b) *During repair in Peterhead, bolts might not have been adjusted to even tightness, causing only parts of gasket to be thoroughly secured.*



The broken gasket

Analysis, comments and conclusions continued...

2) Pipe connected to gasket leaking

Comments:

During repair work after the fire it was noticed the pipe next to the blown sealing was cracked. Reason for crack(s) might be:

a) Corrosion/wear

b) Unevenly tightened bolts, thus adverse tensions.



The new pipe which replaced the broken one

3) Combination of 1) and 2)

Comments

a) The fire might have been initiated by a leaking pipe – and as a consequence hereof the seal breaks.

b) Or gasket breaks first, where after tensions cause cracks in pipe.

c) Or both components broke down simultaneously.

Analysis, comments and conclusions continued...

Since this is a pressurized system, warm lub oil was sprayed up into area between the exhaust manifold and cylinder heads four and five, after which it ignited.

While FMA can express doubts regarding the material of the sealing, FMA is not in a position to determine the quality of the workmanship.

Analysis, comments and conclusions continued...

Why did the main engine not stop when activating the M.E. shut down?

As mentioned in this report, the main engine did not stop, when activating the M.E. emergency stop button navigation bridge.



Main engine emergency stop unit

Investigations carried out reveal the connection between Navigation Bridge and M.E emergency stop unit was broken.

The cable inside the emergency stop unit, located at back end of the main engine was damaged.

Thus the M.E. shut down switch on the Navigation Bridge was inoperative.

The reason for this deficiency is most likely wear due to age and/or vibrations.

During FMA visit onboard 22.08.2011, the Captain informed the shut down button had been tested successfully in spring 2011.

Analysis, comments and conclusions continued...

Why did the main engine keep on running 23 minutes after the quick closing valve day tank had been closed?



Remote for quick closing valve day tank. Located main deck SB.

Since there was minimum load on the main engine, fuel and air consumption for combustion was at a minimum. Thus, it is estimated that fuel already inside system was consumed before main engine stopped.

Likewise, it is estimated that air inside engine room and minor airflow into engine room have contributed to the main engine running for 23 minutes.

Recommendation and reminders

- 1)** Gaskets used in high and fluctuating temperatures and pressure ranges should be made of enforced rubber or similar. Cork gaskets are not considered to meet the requirements.
- 2)** All safety alarms, emergency stops, etc., related to safe operation of the vessel should be tested at intervals of maximum three months.

These may include, however not limited to:

- Main engine emergency stop,
- Aux engine emergency stop,
- Main Engine slow down,
- Quick closing valves,

- 3)** All fire dampers to be checked and moved at intervals of maximum one month.
- 4)** When works carried out by external service company, ship's crew and company must actively ascertain that the quality of work and materials used are at an acceptable level.