MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

INTERIM REPORT

SERIOUS MARINE CASUALTY

OCTOBER 2022

Extract from The United Kingdom Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 – Regulation 5:

"The sole objective of a safety investigation into an accident under these Regulations shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of such an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

As the full investigation report will not be published within 12 months of the accident date, this interim report is published, pursuant to Regulation 14(2)(b) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012.

NOTE

This report is not written with litigation in mind and, pursuant to Regulation 14(14) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.

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Interim report on the investigation of the fire and subsequent loss of power on board the roll-on/roll-off cargo ship *Finnmaster* in Hull, England on 19 September 2021

The information contained in this interim report is based on the various aspects of the investigation completed to date. Readers are cautioned that there is the possibility new evidence may become available that might alter the circumstances as depicted in this report.

FACTUAL INFORMATION

At 2013[1] on 19 September 2021, a fire broke out in the auxiliary engine room on board the Finland registered roll-on/roll-off cargo ship *Finnmaster* during departure manoeuvres in King George Dock, Hull. The fire ignited on one of the auxiliary engines and caused significant damage to the equipment and systems within the compartment **(Figure 1)**, resulting in a total loss of electrical power. The emergency diesel generator started but was unable to supply power to the onboard emergency systems. The loss of power resulted in the vessel drifting until tugs mobilised and assisted it alongside.

Finnmaster

Following initial unsuccessful attempts to extinguish the fire using portable firefighting equipment, the crew activated the fixed high-pressure carbon dioxide (CO_2) fire extinguishing system. However, only half of the assigned CO_2 cylinders discharged and, at 2040, a fire team wearing breathing apparatus entered the auxiliary engine room and extinguished the fire. There were no injuries to either the crew or the single passenger on board.

Figure 1: The auxiliary engine room following the fire

INVESTIGATION

The MAIB's investigation has considered the identified aspects of the accident to determine the causes and circumstances, including the factors that led to the fire, the

[1] Times shown in this report are local time (UTC+1).

effectiveness of the crew's response and the failure of the emergency systems to extinguish the fire. The MAIB has also considered the framework for the approval and oversight of the systems and components installed on board *Finnmaster*.

The initial investigation identified that the partial discharge of the CO_2 fire extinguishing system was because one of the pilot hose couplings had not been fully bored **(Figure 2)** while it was being manufactured, resulting in one of the pilot hose assemblies being completely blocked. The same manufacturing defect was found in two other hose couplings in the vessel's cargo hold CO_2 pilot line system. Testing of the auxiliary engine room's CO_2 system also identified several coupling leaks in the pilot lines.

Following the accident, tests conducted on the high-pressure CO_2 fire extinguishing systems on board the other vessels in the fleet operated by *Finnmaster*'s owner, Finnlines Plc, identified two similar blocked pilot hose couplings on another vessel.

Figure 2: Section through blocked CO_2 pilot hose coupling showing incomplete bore through the stem

ACTIONS TAKEN

In March 2022, the MAIB issued a safety bulletin (SB1/2022[2]) highlighting the risk that high-pressure CO_2 fire extinguishing systems on ships fitted with the affected hose assemblies may not correctly operate in an emergency. The safety bulletin included a recommendation to companies identified as having been supplied with the affected pilot hose assemblies to take immediate remedial action to identify and rectify any blocked assemblies and pilot system leaks on potentially affected CO_2 systems. The safety bulletin also included recommendations to the company that supplied the affected hose assemblies to amend its purchasing and quality control procedures, and to promulgate the safety bulletin to customers that were supplied with the affected hose assemblies.

In response to the safety bulletin, reports of similarly blocked hose assemblies have been received from various companies, including five blocked hose assemblies on one ship.

ONGOING ACTION

The MAIB investigation is substantially complete, and a draft of the report is being prepared and will be distributed to stakeholders for a 30-day consultation period in due course.

The MAIB will continue to monitor reports of blocked hose assemblies in high-pressure CO_2 fire extinguishing systems and welcomes any further such reports in response to its safety bulletin.

[2] https://www.gov.uk/maib-reports/safety-warning-issued-after-discovery-of-blocked-fixed-co2-fire-extinguishing-system-pilot-hoses

SHIP PARTICULARS	
Vessel's name	*Finnmaster*
Flag	Finland
Classification society	RINA S.p.A
IMO number	9132014
Type	Roll-on/roll-off cargo ship
Registered owner	Finnlines Plc
Manager(s)	Finnlines Plc
Year of build	1998
Construction	Steel
Length overall	154.50m
Registered length	145.87m
Gross tonnage	12,433
Minimum safe manning	11
Authorised cargo	Freight vehicles, containers

VOYAGE PARTICULARS	
Port of departure	Hull, England
Port of arrival	Helsinki, Finland (Intended)
Type of voyage	International trade
Cargo information	Freight vehicles, containers
Manning	16

MARINE CASUALTY INFORMATION	
Date and time	19 September 2021 at 2013
Type of marine casualty or incident	Serious Marine Casualty
Location of incident	Hull, England
Place on board	Auxiliary engine room
Injuries/fatalities	None
Damage/environmental impact	Significant fire damage to compartment
Ship operation	Manoeuvring
Voyage segment	Departure
External & internal environment	Still water, light airs, darkness, good visibility
Persons on board	16 crew, 1 passenger