Marine Safety Investigation Unit

Transport Malta

MARINE SAFETY INVESTIGATION REPORT

Investigation into the partial flooding of the engine-room on board the Bulk Carrier

CAPRI

whilst alongside at Dampier, Australia

on 26 December 2017

201712/034

MARINE SAFETY INVESTIGATION REPORT NO. 24/2018

INTERIM

Investigations into marine casualties are conducted under the provisions of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011 and therefore in accordance with Regulation XI-I/6 of the International Convention for the Safety of Life at Sea (SOLAS), and Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009, establishing the fundamental principles governing the investigation of accidents in the maritime transport sector and amending Council Directive 1999/35/EC and Directive 2002/59/EC of the European Parliament and of the Council.

As the full safety investigation report will not be published within 12 months of the accident date, this interim safety investigation report is published, pursuant to Regulation 13(1) of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011.

This interim safety investigation report is not written, in terms of content and style, with litigation in mind and pursuant to Regulation 13(7) of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011, shall be inadmissible in any judicial proceedings whose purpose or one of whose purposes is to attribute or apportion liability or blame, unless, under prescribed conditions, a Court determines otherwise.

NOTICE

The information contained in this interim safety investigation report is derived from the initial notification and subsequent investigation of the occurrence to date. Readers are cautioned that there is the possibility that new evidence, which may alter the circumstances as depicted in this interim safety investigation report, may become available during the course of the safety investigation.

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SUMMARY

Capri, a Maltese registered capsize bulk carrier arrived at Dampier anchorage, Australia on 22 December 2017. The vessel was scheduled to load 164,000 tonnes of iron ore for China.

On 24 December, while at anchor, the vessel deballasted ballast tanks nos. 1 and 4 (port and starboard) in order to reduce the number of ballast tanks which she would have to deballast, once alongside when loading operations would start. The vessel then berthed in the evening of 25 December and since loading had not started, the chief mate opted to strip the ballast tanks that had been emptied during the day before. On completion at 2330, he advised the engine-room to line up the ballast system so that deballasting could take place when loading started.

Loading started at 0229 on 26 December and the chief mate instructed the engine-room to prepare for deballasting operations; this required the starting of an additional generator. The chief mate then opened the remote suction valves to ballast tanks nos. 2 port and starboard. Soon afterwards, a loud bang was heard and the vessel blacked out.

Power was eventually restored and the crew discovered a spray of water coming from the ballast pump suction strainer cover that was reaching the electrical distribution panel located close to the strainer. Water was steadily rising in the engine-room bilges. Despite isolating the ballast system, about 1,100 tonnes of sea water flooded into the engine-room.

The ballast pump strainer cover and a ballast valve appeared to have been damaged when valves to ballast tanks port & starboard nos. 2 were opened. A number of electrical motors, switchboards, cabling, as well as the disabling of the main engine was directly attributed to the ingress of seawater into the engine-room. The vessel was subsequently towed to Singapore where the vessel's equipment was reinstated.

The MSIU was unable to conclude the safety investigation within the 12-month period prescribed in S. L. 234.49. This document is an interim safety investigation report, published in terms of regulation 13(1) of S.L. 234.49.

1 FACTUAL INFORMATION

1.1 Vessels, Voyage and Marine Casualty Particulars

Name	*Capri*
Flag	Malta
Classification Society	Bureau Veritas
IMO Number	9248526
Type	Bulk Carrier
Registered Owner	TMS Dry Ltd
Manager(s)	TMS Dry Ltd
Construction	Steel
Length overall	289.0 m
Registered Length	280.2 m
Gross Tonnage	87,390
Authorised Cargo	Cargo in bulk
Port of Arrival	Dampier
Cargo Information	Iron ore
Manning	22
Date and Time	0232 (LT) on 26 December 2017
Type of Marine Casualty or Incident	Serious marine casualty
Location of Incident	07º 32.9N, 119º 53.6E
Place on Board	Engine-room
Injuries/Fatalities	No injuries or fatalities
Damage/Environmental Impact	Vessel disabled. Physical damage to ballast pump strainer and ballast valve. Water damage to electric motors and auxiliary switchboard.
Ship Operation	Alongside / Moored
Persons on Board	22

1.2 Description of vessel

1.2.1 General

Capri (Figure 1) was built by Nippon Kokan KK (NKK Corp) - Tsu ME, Japan in 2001. She is a capesize bulk carrier and classed by Bureau Veritas for unrestricted navigation.

Figure 1: MV *Capri* viewed from stern

Capri has nine cargo holds with holds nos. 1, 3, 5, 7 and 9 strengthened for alternate hold loading. Her gross tonnage (GT) is 87,390 and net tonnage is 57,416. The vessel has a length overall of 289.0 m and a beam of 45.0 m. Her depth is 24.10 m and the maximum deadweight is 172,579 tonnes at a summer draught of 17.81 m.

Capri's propulsive power is provided by a two-stroke, single acting, 6-cylinder Mitsui MAN-B&W medium speed engine, producing 14,711 kW at 80 RPM. The vessel has one fixed pitch propeller and her service speed is 15 knots.

The vessel is registered in Malta and owned by Aurelia Owning Co Ltd. It is managed and operated by TMS Dry Ltd. (Company) which is based in Athens, Greece. The vessel is traded on the bulk market on a worldwide basis usually either between Brazil and the Far East or between Australia and the Far East.

1.2.2 Ballast system

The ballast water system comprised of two main ballast pumps capable of operating either independently or in parallel. The normal operating pressure of each pumps is 3.0 $kgcm^{-2}$ and the maximum operating pressure is 4.5 $kgcm^{-2}$. A suction strainer is fitted between the sea chests and the ballast pump suction valves.

The ballast pumps can be started either locally or remotely from the Ballast Control Board in the ship's office (Figure 2). The ballast pump discharge valves are operated from the ballast control mimic board.

The ballast water system is also connected to the fire, general service and cargo hold bilge systems.

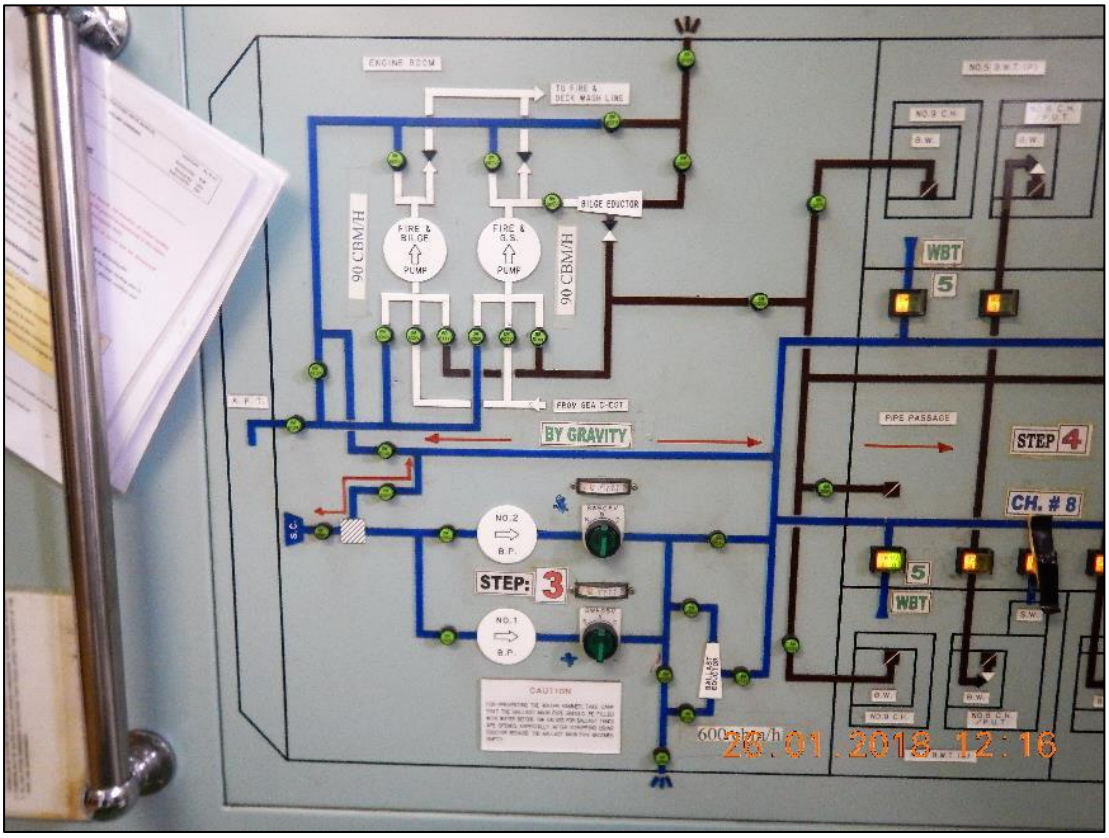

Figure 2: Ballast Control Mimic Board

The ballast pumps are primarily used for ballasting / de-ballasting the vessel's ballast tanks and cargo hold no. 6, which is the ballast hold, as well as driving the ballast eductor for stripping the ballast tanks. The fire and general service pumps are used for pumping out the cargo hold bilges and driving the cargo hold bilge eductor when necessary. A schematic drawing of the ballast piping is provided below at Figure 3.

Most of the valves operating the ballast system are remotely operated from the ballast control mimic board located in the cargo control room. However, a number of valves need to be locally operated from inside the engine-room.

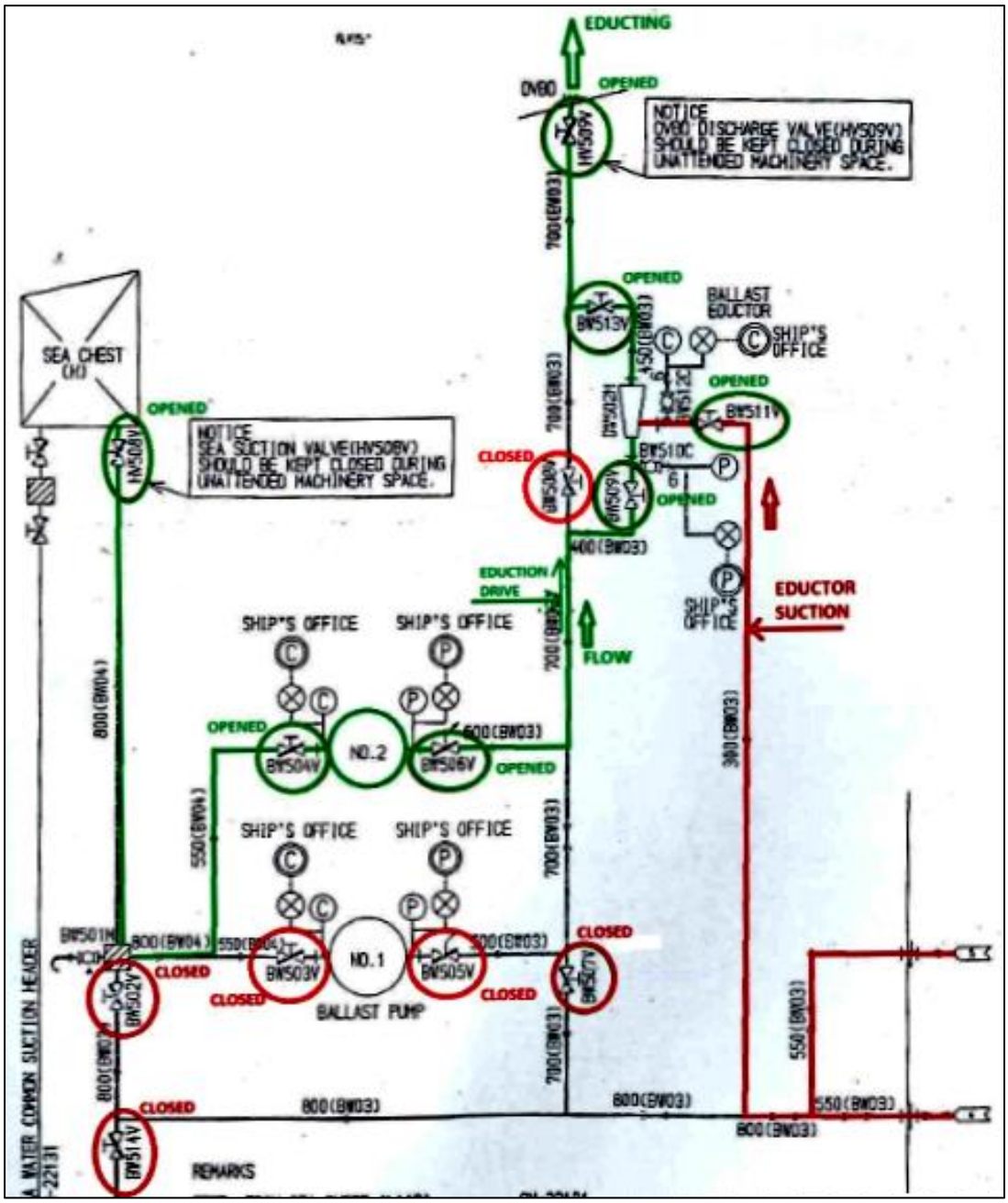

Figure 3: Ballast piping diagram

1.3 Narrative

1.3.1 Events leading up to the incident[1]

Capri arrived at Dampier anchorage, Australia, in ballast at 2200 on 22 December 2017. She was scheduled to load a cargo of iron ore of about 164,000 tonnes, bound for China.

At 0945 on 24 December, the vessel started deballasting ballast tanks nos. 1 and 4 port and starboard in order to reduce the number of tanks she would have to deballast when loading would start, once alongside. This was completed at about 1800.

At 1936 on 25 December, the vessel came alongside berth no. 5 at Parker Point. Her drafts were noted to be forward 7.10 m and aft 8.90 m. Soon afterwards, at 2000, ballast tanks nos. 1 and 4 port and starboard were stripped using ballast pump no. 2 and the ballast eductor (Figure 3).

At 2044, the auxiliary boiler alarm (emergency shut off) was activated, which was acknowledged by in the engine control room.

At about 2300, the chief mate called the engine-room, which was manned by the fourth engineer and oiler and informed them to stop the stripping operation of ballast tanks nos. 1 and 4 port and starboard, as they were empty. He then instructed them to prepare the valves for deballasting ballast tanks nos. 2 port and starboard. The watchkeeping oiler then operated the ballast valves and left them with the following status:

- engine-room operated valves open: BW508V, BW502V and HV509V;
- engine-room operated valves closed: BW509V, BW507V, BW514V, HV508V, BW503V, BW504V, BW511V and BW513V;
- ballast control mimic board (ship's office) remotely operated valves closed BW506V, BW505V (Figure 3).

At about 2330, generator no. 1 was stopped as no cargo or deballasting operations were anticipated. At 0000 (26 December), the engine-room watch was taken over by the third engineer and duty oiler.

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[1] Unless otherwise stated, all times are local time.

At 0130 on 26 December, the chief engineer, third engineer, and electrician were busy working on the auxiliary boiler that had previously alarmed and unable to operate in automatic mode.

At 0229, the chief mate observed that loading operations had commenced and instructed the engine-room personnel to prepare for the de-ballasting of ballast tanks nos. 2 port and starboard in accordance with the vessel's loading plan. The chief mate then also opened the remotely operated tank valves for ballast tanks nos. 2 port and starboard from the ballast control mimic board.

At about 0231, generator no. 1 was started to be put on line with generator no. 2 to provide power for operation of the ballast pumps. Soon afterwards, at around 0232, a loud bang was heard, and a blackout occurred. The emergency generator automatically started supplying power to the emergency circuits including emergency lighting.

Electrical power was initially restored using generator no. 2 and an inspection of the engine-room was carried out. The crew noticed a spray of water coming from the ballast pump suction strainer cover that was reaching the electrical distribution panel located close to the strainer. Moreover, water was steadily rising in the engine-room bilges.

Numerous breakers were tripped in the engine control room to isolate the affected distribution panel and this resulted in a loss of cooling water to the generators as the sea water cooling pumps were supplied from this panel. In addition, the crew members then closed ballast valves BW508V, BW502V and HV509V in order to isolate the strainer and stop the ingress of water.

At 0250, emergency power was again supplied from the emergency generator.

A draft survey carried out after the flooding indicated that about 1,123 tonnes of sea water had flooded the engine-room.

1.3.2 Post incident events

At 0310, the master completed the 'Emergency Check List for Flooding'. An assessment indicated that the water level in the engine-room had reached a level of

approximately 2.3 m above the tank top, and numerous motors were submerged with switchboard and cabling affected by sea water impingement, as well as seawater ingress in the main engine sump tank.

At 0320, the master informed the Company of the situation and then stopped cargo operations at 0330.

Power to the vessel was restored by starting generator no. 3 and connecting the cooling water system to the vessel's emergency fire pump using flexible hoses. The crew then started transferring the water from the engine-room to the aft peak tank, using portable pumps.

At about 0625, the Harbour Master boarded the vessel to assesses the situation and at 0925, two Australian Maritime Safety Authority (AMSA) surveyors attended the vessel to carry out an investigation. By 1200, AMSA had issued a detention notice to the vessel and stopped the vessel from transferring further water to the aft peak tank.

Capri remained alongside and at 1030 on 27 December, AMSA granted permission to re-commence the transferring of water from the engine-room bilges to the after peak tank.

Prior to the vessel being given permission to be towed to Dampier anchorage, both AMSA and Bureau Veritas required the following works to be carried out:

a) all water to be transferred from the engine room bilges to the after peak tank;

b) engine-room bilges to be cleaned of oil;

c) ballast pump suction strainer to be repaired and re-fitted; and

d) operation of the three pumps to supply cooling water to generators, air conditioning and domestic refrigeration plants to be restored and that one pump was also required to provide water for the fire mains.

On 28 December, an engine manufacturer's representative attended the vessel and confirmed that the main engine could not be started. On the same day, the Dampier Harbour Master informed the vessel that permission would not be granted to remain at anchorage as there was potential for a cyclone to form in the area. He also advised that the vessel would require towage to a convenient repair facility.

As the water level in the engine-room bilges was reduced, it was found that ballast valve BW507V was damaged and leaking water. AMSA required that the leakage was isolated prior to the vessel being towed.

On 29 December, *AHTS Pacific Centurion* was fixed by the Company to tow the vessel from Dampier to Singapore.

Restoration of the cooling sea water pump capability continued and on 31 December, five pumps were available for use with two of these also being capable of being used for firefighting.

On 01 January 2018, permission was granted to tow the vessel to Dampier anchorage and await *AHTS Pacific Centurion*'s arrival for subsequent towage to Singapore for repairs. On 02 January 2018, the vessel was shifted by local tugs to Dampier anchorage, where repairs were continued in accordance with Bureau Veritas' and AMSA's requirements for the tow to Singapore to be undertaken.

On 08 January 2018, the vessel tow to Singapore commenced, arriving in Singapore on 20 January following an uneventful voyage, following which she proceeded to Keppel Shipyard for repairs.

2 SAFETY INVESTIGATION ACTIVITIES

The MSIU were notified of the accident on 26 December 2017. Due to the remote location of the port and availability of an expert, the MSIU representative did not attend the vessel until the vessel had arrived at the repair facilities in Singapore.

The MSIU representative attended the vessel on 26 January 2018 where a number of crew members were interviewed. In addition, other information, documentary evidence and an inspection of the site was carried out.

The MSIU is continuing with the collection and analysis of a range of evidence relevant to this occurrence. Based on the information already available, the MSIU safety investigation will be focusing on several areas including:

- the cause of the flooding and subsequent black out on board *Capri*;
- the actions of the crew members on *Capri*; and
- situational factors, decision-making and monitoring during the course of events leading to the incident.

It is estimated that the safety investigation is concluded in the first quarter of 2019.