

Captain Aysuna: Fire at sea, 8 October 2001



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Captain Aysuna: Fire at sea, en route to Tasmania

Captain Aysuna

Captain Aysuna is a 5-hatch, geared, Panama flag bulk carrier. The vessel, built at the Usuki Iron Works Ltd in Saiki, Japan in 1985, is classed with Nippon Kaiji Kyokai. It is owned by Hydale Trading Corporation and, at the time of the incident, was on time charter to BHP Transport and Logistics Pty Ltd.

The vessel has a length overall of 168 m, a beam of 27 m and a depth of 13.45 m. It has a gross tonnage of 16 080 and a summer deadweight of 26 914 tonnes at a draft of 9.547 m. *Captain Aysuna* is powered by a Mitsubishi 6 UEC52LA slow speed diesel engine delivering 5 279 kW to a single, fixed-pitch, propeller, giving the vessel a service speed of 13.5 knots.

The vessel had a crew of 24, comprising 19 Bulgarian and two Indian nationals, a Russian, a Yugoslav and a Turk.

The incident

At about 2000 on 6 October 2001, *Captain Aysuna* sailed from Newcastle with a part cargo of mineral concentrates for discharge at Hobart and Port Pirie. The draft was 6.93 m forward and 10.28 m aft.

As the ship headed south towards Tasmania, the SSW wind steadily increased from force 3 to gale force 8 by midnight on 7 October.

At about 1700 on 8 October, the vessel was off Flinders Island in Bass Strait. The wind was still from the SSW at force 8 and, in 4 metre swells, the ship was rolling and pitching, taking seas over the decks and hatches.

In the engine room the duty motorman was working beside the engine, on routine maintenance tasks, while the duty engineer was in the control room. The motorman noticed 'twinkling red lights' at the top of the engine and went up towards the control room to investigate. When he got to the control

room, he saw flames and thick black smoke emanating from the vicinity of the turbocharger. At the same time, 1739, the fire alarm sounded. The duty engineer also saw fire and smoke from the area around the turbocharger.

After deciding that they could not fight the fire with portable extinguishers, both men left the engine room. They met the chief engineer at the engine room entrance and briefed him on the situation.

On hearing the alarm, the master went to the bridge, from where, looking aft at the engine room skylight, he saw flames and thick black smoke pouring out. He mustered the crew, satisfying himself that all personnel were safe, then organised the crew to both tackle the fire and prepare the lifeboats.

The master and chief engineer were concerned that there might be an explosion and they decided to flood the engine room with CO₂. The remote fuel trips and machinery stops were activated, stopping the main engine and other machinery in the engine room. The emergency generator and emergency fire pump were started. The ventilation to the engine room was stopped and the fire flaps and doors were closed, sealing the space.

At 1754, CO₂ was released into the engine room while the crew started boundary cooling the space.

An urgency message was transmitted to AusSAR, the Australian search and rescue organisation. Calls were also broadcast on VHF and MF radio to alert local stations and ships in the vicinity to the situation on board.

AusSAR diverted a tanker, *Rere Moana*, towards *Captain Aysuna* to rescue the crew if necessary. AusSAR also alerted fixed wing aircraft and helicopters in case they were required and a tug was despatched from Melbourne to assist with a tow.

At 1930, after monitoring the areas around the engine room, the master and chief engineer decided that the fire had been extinguished. At 1939, the master advised AusSAR that the fire had been extinguished and the ship no longer required assistance. He also requested that his urgency message be cancelled.

At 2140, the engine room was opened and ventilated. At 2315, a team with breathing apparatus and fire suits entered the engine room and checked the entire space. After the 'all clear' was given at 2335, the chief and other engineers entered the engine room to check the machinery.

On 9 October at 0030, the main diesel generators were restarted, the emergency generator was stopped and further checks were made of machinery and systems. At 1400, after fuel, lubricating oil and other systems were found to be satisfactory, the main engine was restarted. Though there was no evidence of damage to the turbocharger, the engine was run at slow speed until 1825, when the speed was increased to 'full ahead' and the voyage to Hobart resumed. At 1800 on 10 October, the vessel arrived at Hobart.

At Hobart, an investigator from the ATSB conducted an investigation into the fire. The vessel was also attended by the Australian Maritime Safety Authority, a Class surveyor and the owner's representative. All appropriate checks were carried out and the CO₂ system was recharged. After discharge of the cargo, the ship sailed at 0330 on 13 October for Burnie and Port Pirie.

The investigation

The master and crew were initially reluctant to assist with the ATSB investigation of the incident. However, after discussions with the owner's representative and a legal representative from the vessel's insurers, the master, chief engineer and relevant officers and crew were interviewed by an investigator from the ATSB. The chief engineer was unhappy that the incident was being investigated by the ATSB. He became more and more agitated as time went on and, before the ship sailed from Hobart, he asked to be relieved. The owner's representative replaced him as chief engineer.

To assist with the investigation, the ATSB requested specialist fire investigators from the Tasmanian Fire Brigade at Hobart to examine the scene of the fire.

The damage was confined to the engine room and funnel. There was fire damage around the turbocharger on the inlet side and the main exhaust trunking. This damage continued up the starboard outer engine room bulkhead aft of, and above, the turbocharger and under the starboard side of boiler flat above.

Heat and smoke damage was evident around the forward areas of the waste oil and boiler fuel tanks, where the polycarbonate sight glass of the overflow pipe for the waste oil tank had melted.

The engine room had also suffered significant smoke damage above the boiler flat level and upward throughout the internal funnel areas.

Unfortunately, in the one remaining day before the ship arrived at Hobart, the ship's staff had performed significant, rapid, cosmetic maintenance work in the engine room, despite the weather conditions, cleaning and painting over the affected areas. This had the effect of masking any evidence that would have assisted with determining the cause of the fire.

FIGURE 1:
Seat of the fire, on top of the turbocharger, directly beneath the edge of the boiler flat

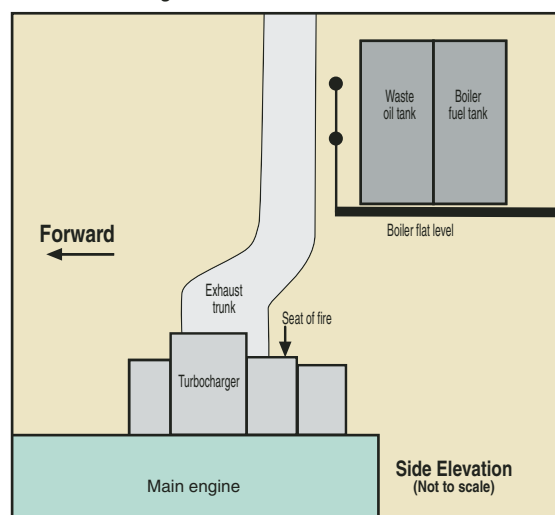


FIGURE 2:
Photograph of seat of fire



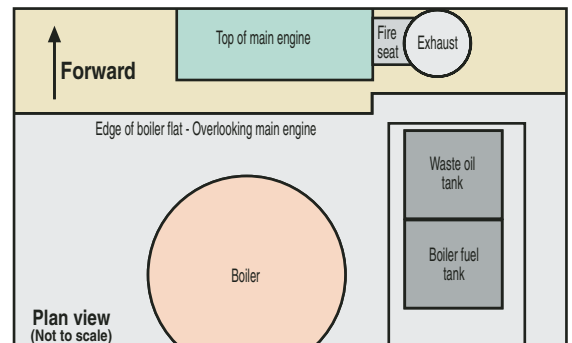
The seat of the fire and sources of ignition and fuel

The investigation determined that the seat of the fire was alongside the intake for the turbocharger, directly beneath the edge of the boiler flat on which there were small waste oil and boiler fuel tanks. The surface temperatures here would have been about 350-400° C, sufficient to ignite diesel and other fuels in use in the engine room. Safety data sheets for diesel fuels suggest a minimum auto-ignition temperature of 250° C. Typical auto-ignition temperatures for diesel fuels are in the order of 300-350° C.

Attempts to identify the source and type of fuel were unsuccessful. The indication is that the fuel was most probably diesel from the smell, volume and density of the smoke produced during the fire. There was diesel fuel in the boiler fuel tank on the boiler flat level, but the level in this tank and the waste oil tank, based on internal inspections and records, was the same before and after the fire.

Though the ship's crew was queried about the source of the fuel for the fire, no one would state what that fuel might have been. In addition, statements made during the interviews were not consistent with physical evidence indicating the seat of the fire.

FIGURE 3:
The waste oil and boiler fuel tanks and the boiler flat overlooking the main engine and turbocharger



The indications are that the fire was started and fed with a small quantity of fuel and that this fuel was not sprayed or atomised onto the seat of the fire. There was no report or indication of an explosion. The fire did not last for long, nor did it cause a great deal of heat damage beyond the area of the waste oil tank immediately above. The large volume of black smoke that was produced indicates that the process of combustion was poor. When the crew re-entered the engine room to check the space after the fire, there were no signs of any residual fuel present at the site.

A crew member was known to have been working on some machinery on the deck above the seat of the fire. Typically, a cleaning fluid, such as diesel oil, is used to assist with such work. It seems unlikely that any oil from the boiler fuel or waste oil tanks had spilled onto the hot surface near the intake for the turbocharger. The possibility that the diesel oil being used for cleaning purposes spilled from a container on the deck directly above onto this surface and ignited would appear to be logical. The temperature of the surfaces here would be high enough to cause auto-ignition of such oil.

With respect to the location of the fire and its cause, the conclusions drawn by the investigators from the Tasmanian Fire Brigade, reached independently, were the same as those of the ATSB.

Conclusions

There was a definite and concerted attempt by members of the crew not to cooperate with the investigation. The area affected by the fire was cleaned and painted over in an attempt to hide all evidence of the cause of the fire, and, while the crew almost certainly knew what had caused the fire, they did not divulge this information to the ATSB.

It is probable that the fire was caused by spillage of a small amount of fuel from a container left at the forward edge of the boiler flat. The fuel, probably being used as a cleaning medium, could have spilled as a result of movement of the ship in rough seas. It is likely that this fuel was diesel oil.

The fire, while it produced a quantity of flame and smoke, only caused minor paint damage and did not cause any damage to machinery.

Recommendations

MR20030029

Ships' personnel should be made fully aware of the precautions necessary to prevent fires in machinery spaces – in particular, the maintenance of clean conditions, the prevention of oil leakage and the removal of all combustible materials from vulnerable positions.

MR20030030

Ships' personnel should note that wood, paints, spirits and tins or containers of oil should not be kept in boiler rooms or machinery spaces.

MR20030031

Shipowners, managers and operators should ensure that their crews are encouraged to cooperate with investigatory authorities to promote safety at sea and prevent the recurrence of incidents and accidents.