



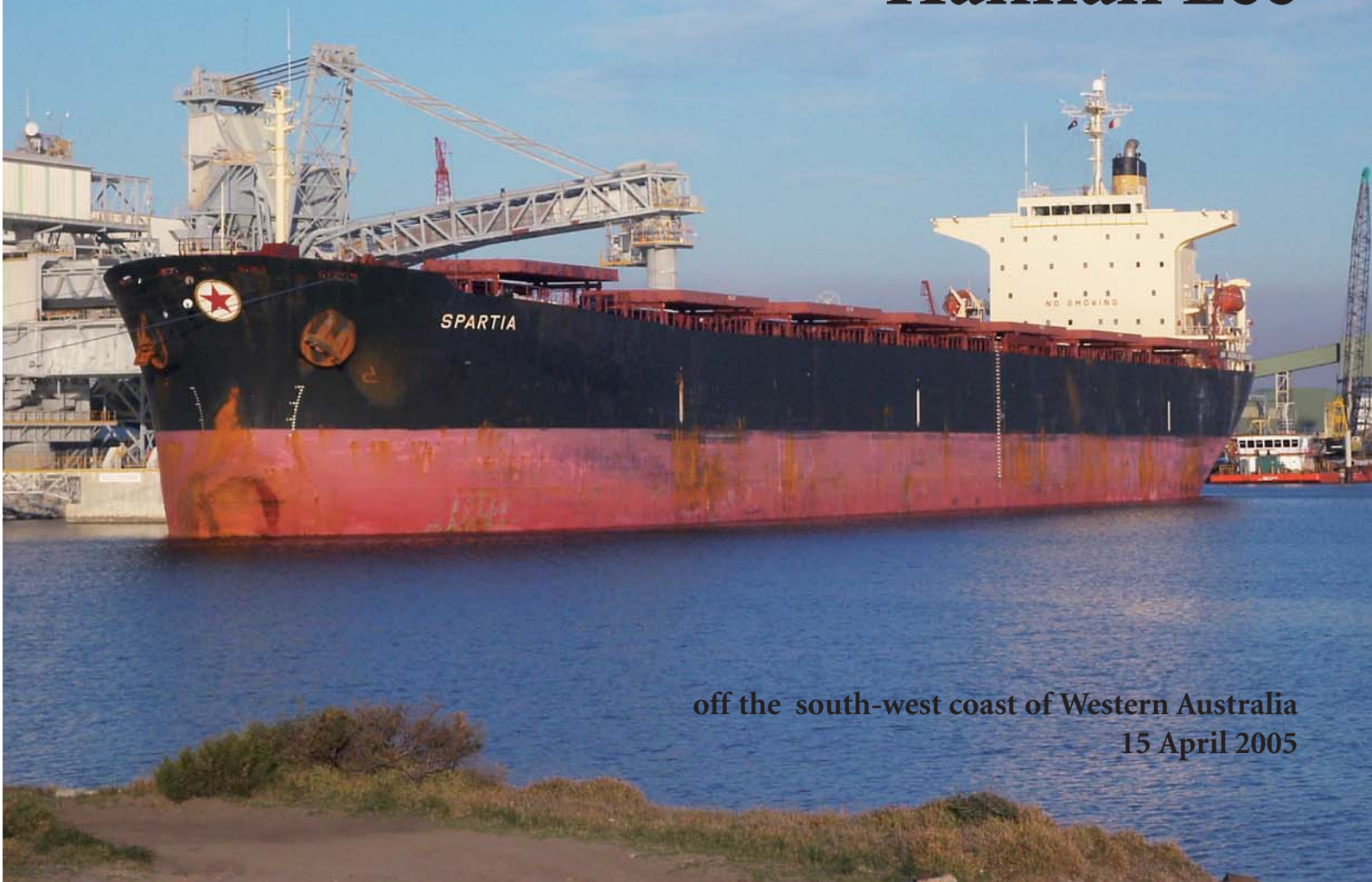
Australian Government
Australian Transport Safety Bureau

Safe Transport

MARINE SAFETY INVESTIGATION
No. 211

Independent investigation into the collision between the

Greek registered bulk carrier
Spartia
and the Australian fishing vessel
Hannah Lee



off the south-west coast of Western Australia
15 April 2005



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Media Release

Bulk carrier and fishing vessel collide off Western Australia's south-west coast

Failing to keep a proper lookout was the major cause of yet another collision between a trading ship and a commercial fishing vessel, according to an Australian Transport Safety Bureau (ATSB) investigation report released today.

The ATSB report into the incident states that, at 0535 (local time) on 15 April 2005, the Greek registered bulk carrier *Spartia* and the Western Australian cray fishing vessel *Hannah Lee* collided 17 nautical miles west of Cape Bouvard. *Spartia*'s crew had detected the fishing vessel about 20 minutes prior to the collision, using the ship's radars. They had assessed that a risk of collision existed but, as *Hannah Lee* was on their port side, they maintained *Spartia*'s course and speed, in accordance with the international collision regulations. *Hannah Lee*'s skipper was preoccupied with keeping his vessel on course and had failed to see *Spartia* in the time leading up to the collision.

When it became obvious to *Spartia*'s bridge team that *Hannah Lee* was not going to give way, the master ordered avoiding action. This manoeuvre was ineffective and *Hannah Lee* hit *Spartia* a short time later. No one was injured in the collision and there was no pollution.

The report concludes that the lookout being kept by the skipper of *Hannah Lee* in the period leading up to the collision was manifestly inadequate. In addition, his judgement, actions and situational awareness, with regard to what was happening around his vessel, were affected by fatigue. This was probably as a result of his work routine and other activities he had undertaken in the week prior to the collision. The report recommends that State and Territory marine authorities consider reviewing current work practices on fishing vessels, with a view establishing crew fatigue management guidelines.

The report also concludes that the action taken by the crew of *Spartia* to avoid the collision, when *Hannah Lee* was only one nautical mile away, was too little, too late.

The ATSB has investigated 23 collisions between ships and fishing vessels since 1990. The failure to keep a proper lookout was identified as a factor in each of the collisions.

Copies of the report can be downloaded from the ATSB's internet site at www.atsb.gov.au, or obtained from the ATSB by telephoning (02) 6274 6478 or 1800 020 616.

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1 SUMMARY

At 0535 on 15 April 2005, the Greek registered bulk carrier *Spartia* collided with the Australian rock lobster fishing vessel *Hannah Lee*, 17 nautical miles off Cape Bouvard, in position 32° 43.8'S, 115° 16.9'E, on Western Australia's south-west coast. *Spartia* was in ballast and making for the port of Bunbury to load alumina. *Hannah Lee* had departed the small port of Mandurah at 0345 to work its rock lobster pots located approximately 37 nautical miles south-west of the port.

Hannah Lee's skipper failed to observe *Spartia* in the time leading up to the collision as he was preoccupied with keeping his vessel on course. The bridge team on *Spartia* had identified the fishing vessel about 20 minutes prior to the collision. They had assessed that a risk of collision existed but, as *Hannah Lee* was on their port side, they maintained the vessel's course and speed, in accordance with the international collision regulations. When it became obvious to the bridge team that *Hannah Lee* was not going to give way, the master ordered avoiding action, consisting of a change in course and turn to starboard.

This action was ineffective in preventing the collision and *Hannah Lee* impacted *Spartia*'s port side, in way of number six hold a short time later. No one was injured in the collision and no pollution resulted.

After the collision, *Spartia* continued its voyage to Bunbury, where it anchored at 0900. *Hannah Lee* made for the port of Fremantle where it berthed at a repair yard at about 0910.

The report concludes that:

- The visual lookout being maintained on board *Hannah Lee* was inadequate, ineffective and in the minutes prior to the collision, non-existent.
- The VHF on board *Hannah Lee* was not tuned to the internationally accepted distress and calling frequency, channel 16.
- Engine noise emanating from the rear of the wheelhouse prevented *Hannah Lee*'s skipper hearing any sound signal from *Spartia*'s forward whistle.
- A non-operational radar prevented *Hannah Lee*'s skipper from detecting *Spartia* by this means in the time leading up to the collision.
- *Hannah Lee*'s skipper did not have the required knowledge of the COLREGS and his obligations under them.
- It is probable that *Hannah Lee*'s skipper's judgement, actions and situational awareness were affected by fatigue as a result of his work routine and waking time activities over the previous week.
- The decision by *Spartia*'s master to take avoiding action when *Hannah Lee* was one nautical mile away was too little and made too late.

It is also considered that:

- VHF recordings from the Fremantle Port Authority indicate that it is probable that *Spartia*'s bridge team did not attempt to use VHF channel 16 to alert *Hannah Lee* to the presence of the ship in the period of time leading up to the collision, despite their claims to the contrary.
- Both vessels should have stopped and established contact as soon as possible after the collision.

The report recommends that:

- All State and Territory registered commercial vessels operating offshore should be required to carry an operational VHF radio which is capable of maintaining a continuous watch on channel 16 (156.8 MHz) and, if required for vessel operations, another channel.
- Skippers of commercial State and Territory registered vessels should ensure that they have a full understanding of the COLREGS and their obligation under those regulations, with particular regard to keeping a lookout and actions to avoid a collision.
- State and Territory marine regulatory authorities should consider amending their policy and regulations with regard to perpetual certificates of competency with a view to implementing a revalidation process consistent with the requirements of the National Standard for Commercial Vessels.
- State and Territory marine regulatory authorities, through the National Marine Safety Committee, and in consultation with the Australian Seafood Industry Council, should ensure the safety and welfare of fishing vessel crews by reviewing work practices on Australian fishing vessels with a view to establishing guidelines for the management of crew fatigue.

2 SOURCES OF INFORMATION

The master, officers and crew of *Spartia*

The owner/skipper of *Hannah Lee*

Western Australian Department for Planning and Infrastructure

Fremantle Port Authority

Acknowledgement

InterDynamics' Fatigue Audit InterDyne (FAID)

References

The International Management Code for the Safe Operation of Ships and for Pollution Prevention [International Safety Management (ISM) Code] as adopted by the International Maritime Organization by Resolution A.741(18).

International Convention for the Safety of Life at Sea, 1974, and its Protocol of 1988 (SOLAS), the International Maritime Organization.

International Regulations for Preventing Collisions at Sea, 1972 as amended, the International Maritime Organization.

Uniform Shipping Laws (USL) Code, Australian Transport Advisory Council, as amended 1989.

W. A. Marine (Radiotelephony) Regulations 1981.

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3 NARRATIVE

Spartia

Spartia is a Greek flagged, gearless ‘panamax’¹ bulk carrier. It has an overall length of 225.00 m, a breadth of 32.20 m and a depth of 19.15 m. It has a deadweight of 75 115 tonnes at its summer draught of 13.841 m. *Spartia* was built by Hitachi Zosen Corporation, Maizuru, Japan and launched in May 2000. The ship is owned by Fowler Transportation E.N.E., Piraeus, Greece and is managed by Neda Maritime Agency Company, Piraeus, Greece. At the time of the incident, *Spartia* was on a time charter to Atlas Shipping, Copenhagen, Denmark. It is classed with Lloyd’s Register of Shipping (LR) as a ✕100 A1 bulk carrier, with ✕LMC and UMS notations.

Spartia’s seven cargo holds are located forward of the accommodation block. The accommodation front is 193.30 m from the stem and 31.65 m from the stern of the vessel. The height of eye (HOE) for a watch keeper on *Spartia*’s navigation bridge is approximately 25 m above the water at its summer draught. At the time of the incident, with the mean draught in ballast condition being 7.50 m, the HOE was approximately 32.50 m. This gave the watch keeper a visual distance to the horizon in excess of 11 nautical miles, in good conditions. The vessel’s hull is painted black, with pink boot topping.

FIGURE 1: *Spartia* arriving at Bunbury in ballast



1 Size limited by the dimensions of the Panama Canal.

Spartia's navigation bridge is made up of a combined wheelhouse and chartroom. At night the two areas are separated by a curtain. *Spartia* is equipped with a range of navigation and communications equipment in accordance with SOLAS² requirements. Two JRC JMA-9000 series Automatic Radar Plotting Aid (ARPA) radars (X-band and S-band) are located on the port side of the wheelhouse. Two JRC JHS-32A marine Digital Select Calling (DSC) VHF units are mounted below the bridge windows, both to port of the vessel's centreline. The Global Maritime Distress and Safety System (GMDSS) equipment is located on the starboard side of the chartroom. A gyro repeater is located on the bridge front, on the vessel's centreline. A Yokogawa KR 100A course recorder is mounted on the after bulkhead in the chartroom.

Spartia is powered by a single Hitachi Zosen B&W 6S60MC 6-cylinder, 2-stroke diesel engine which drives a single, seven metre diameter, four bladed fixed pitch propeller. Total engine power produced is 10 750 kW (14 610 HP) which gives a service speed of 14 knots.

All of the ship's officers were appropriately qualified and held the necessary certification. When at sea, the mates maintain a standard 'four-on, eight-off' navigational watch keeping routine. *Spartia*'s engineering officers work a 24-hour duty roster with the engine room unmanned outside normal working hours. At the time of the incident, *Spartia*'s crew of 22 comprised thirteen Greek, eight Filipino and one Polish national.

Spartia's master held a Greek foreign-going master's certificate of competency. He had 20 years seagoing experience. He had served as master on 'panamax' and 'cape-sized' bulk carriers trading world-wide since January 2001. In October 2004, he joined *Spartia* as master. This was his first contract with Neda Maritime. Prior to joining the vessel, he spent four days in Neda's office in Piraeus familiarising himself with company requirements and having an introduction to the procedures on board Neda vessels.

The second mate on watch at the time of the incident had been at sea since 1994, initially as an engineering cadet. He gained his Greek foreign-going second mate's certificate of competency in November 1998. He had served on a variety of ship types in his career, including oil tankers and bulk carriers. He joined *Spartia* for the first time on 21 February 2005.

Hannah Lee

Hannah Lee is a 16.65 m wooden rock lobster fishing vessel. Built in 1995 by Marko's Slipways in Fremantle, it has a gross tonnage of 24. It is registered with the Western Australian (WA) Department of Planning and Infrastructure as a class 3B vessel³. *Hannah Lee* operates out of the port of Mandurah, about 100 km south of the Western Australian (WA) capital of Perth.

Hannah Lee's monohull is of bonded marine plywood construction, over hardwood frames. The wooden decks are sheathed in Glass Reinforced Plastic (GRP). It has a beam of 4.90 m and a depth of 1.70 m. Its wheelhouse and decks are painted white.

2 The International Convention for the Safety of Life at Sea, 1974 as amended, Chapter V.

3 Seagoing fishing vessel for use in all operational areas up to and including offshore operations.

Where the deck meets the hull, the vessel has a rubbing strake which is faced with an aluminium strip.

Hannah Lee is powered by a single 'V' ten M.A.N. twin turbocharged 603 kW diesel engine. The engine drives a single propeller, giving the vessel an operating speed of between 17 and 21 knots.

Hannah Lee is equipped with a range of navigation equipment. This includes a Kodan MD-3630 radar, a Furuno GP-31 GPS receiver, a 'C-Plot' Electronic Chart System (ECS), a Coursemaster 550 autopilot, an ICOM IC-M45 VHF radio, a Kodan 9390 medium frequency/high frequency (MF/HF) radio and a JRC colour echo sounder.

FIGURE 2: *Hannah Lee* in Fremantle



Hannah Lee is owned and operated by the skipper who was on board at the time of the collision. The vessel is typical of many WA rock lobster fishing vessels operating off the coast with the wheelhouse located forward of a large rear working deck. Access to the wheelhouse is via a single door which leads from the working deck. The helm, engine controls and navigation equipment are located on the port side, forward in the wheelhouse. A small saloon area is located on the starboard side with a small food preparation area located aft of the helm position. A central companionway leads from the wheelhouse to sleeping accommodation located beneath the forecastle deck, forward of the wheelhouse.

At the time of the incident there were three crew on board *Hannah Lee*, the skipper and two deckhands. *Hannah Lee*'s owner/skipper, who had purchased the vessel in February 2005, was an experienced fishing vessel skipper and had been fishing for rock lobster in the waters off Mandurah since 1965. He held a perpetual Skipper Grade 2 certificate of competency, which was issued in June 1972. He also held a

Marine Motor Engine Driver of a Fishing Vessel certificate, which was issued in 1965.

Western rock lobster season

The WA western rock lobster fishing season lasts each year from 15 November to the following 30 June. The fishery is primarily an inshore fishery with most of the recognised fishing grounds located between latitudes 22° and 35° south, in water depths of 50 to 300 m. Each rock lobster fishing vessel is licensed to carry and work a fixed number of lobster pots. *Hannah Lee* is licensed to work 116 pots.

The usual routine when fishing is to set the pots in known or previously productive fishing grounds using a GPS plotter or an ECS. The pots are checked daily, not before 0430 in the summer months and 0600 in the winter months of the season. The catch is then transported to a processing works, in this case Fremantle, where it is off loaded, sorted, packaged and then shipped to local, interstate and international markets.

The incident

Spartia

On 1 April 2005, *Spartia* departed Kwangyang, Republic of Korea, for Bunbury on the southern coast of Western Australia, where it was to load a cargo of about 66 000 tonnes of alumina for South Africa. The vessel was in ballast and the voyage from Kwangyang was uneventful, with regular ship-board routines being followed.

At 2345⁴ on 14 April, the Officer of the Watch (OOW) rang his relief, the second mate, to wake him. At 2355, the second mate arrived on the bridge. Normally he would have stood the 0000 – 0400 navigation watch, however, as was normal practice on board *Spartia* on the morning prior to arriving in port, the two junior mates stood six hour watches, allowing the chief mate to prepare for arrival. The second mate received a handover from the OOW, who left the bridge shortly afterwards. A seaman, acting as lookout, was assisting the second mate on the bridge. The ship was following a course laid down on the chart of 154°(T) at a speed of about 13 knots.

The weather was fine and clear. Light from coastal towns could be seen from the bridge. The sky was clear and moonless (moonrise at 1014) and the wind was estimated to be from the south-south-east at force five (17 to 21 knots).

At about 0430, the second mate called the master at the position the master had indicated on the chart. The master arrived on the bridge at 0440. He went into the wheelhouse and briefly spoke to the second mate. He then returned to the chart room, followed by the second mate. There the second mate briefed the master as to the vessel's position, course and speed and traffic in the area. The second mate then returned to the darkened wheelhouse, leaving the master to prepare himself for the arrival off Bunbury.

4 Western Australian Standard Time.

At about 0500, the second mate identified two small targets on the radar. These were about six nautical miles away and he recalled the small vessels being about two points (22.5 degrees) forward of the port beam, one closer to *Spartia* than the other. He started tracking the vessels using the Automatic Radar Plotting Aid (ARPA) function of the radar. The consistent course and speed of both vessels enabled the ARPA to accurately calculate their closest point of approach (CPA) and their time to closest point of approach (TCPA).

The information presented to the second mate by the ARPA indicated that the CPA of the closest fishing vessel was very small and therefore a risk of collision existed. The ARPA indicated that the other small vessel, further from *Spartia* and to the west of the closer vessel, would pass ahead of the ship and did not present a risk of collision. He passed this information to the master, who confirmed this using the other radar. Both men then continued to monitor the radars and assess the situation as it developed.

At about 0520, when the range between *Spartia* and the nearer small vessel closed to between three and four nautical miles, the green starboard side navigation light and masthead light of the fishing vessel were clearly seen by all three men on *Spartia's* bridge. Knowing that *Spartia* was the 'stand on vessel' under the COLREGS⁵, the second mate stated that he attempted to alert the small vessel, by calling it on VHF channel 16. He received no reply. The radars continued to show that the course and speed of the fishing vessel had not changed and that the CPA indicated that a very real risk of collision existed.

Both the master and the second mate stated that they continued to try to alert the vessel to *Spartia's* presence and the risk of collision using the VHF radio on channel 16, the ship's forward whistle and the aldis lamp. All these methods failed and the fishing vessel maintained its course and speed.

At 0530, when the distance between the two vessels was about one nautical mile, the master put the lookout on the helm. Shortly afterwards, the master became aware that a collision was imminent. In his statement, he said that he ordered the wheel to be out 'hard to starboard'. Almost immediately, *Spartia* began to swing. The master and second mate went onto the port bridge wing and the second mate stated that he had continued to flash the aldis lamp at the smaller craft.

At 0535, the two vessels collided in position 32° 43.8'S, 115° 16.9'E, with the fishing vessel impacting on *Spartia's* hull in way of number six hold.

Hannah Lee

Hannah Lee departed Mandurah Boat Harbour at about 0345 on 15 April. On board were the skipper/owner and two deckhands. The vessel was on a trip to haul lobster pots which were located about 37 nautical miles south west of Mandurah. The weather was fine and clear with a south-south-east wind of between 13 and 18 knots. The sea was from the south-east at between one and one and a half metres. The skipper described the visibility as fair. The moon was below the horizon

5 International Regulations for Preventing Collisions at Sea, 1972 as amended.

and the sun was due to rise at 0640. *Hannah Lee*'s radar was operating when the vessel departed Mandurah, but failed a short time later.

After departure, the two deckhands went below to the sleeping quarters to sleep for the two and a half hour trip to the fishing grounds. The skipper remained in the wheelhouse and, when clear of the entrance to Mandurah Boat Harbour, he set a heading line on the ECS which gave him a course of 239°(T) to steer to the first line of lobster pots. He set this course on the autopilot but remained at the helm. At this point, *Hannah Lee* was making good a speed of about 14.4 knots.

The sea on the port bow meant that the skipper had to monitor the *Hannah Lee*'s position on the ECS and make frequent adjustments to the autopilot setting to keep *Hannah Lee* 'on track' (the autopilot and ECS were not interfaced). The sea on the port bow also meant that spray on the wheelhouse windows partially obscured the skipper's visibility. The vessel was not equipped with any method to wash the spray off.

During the passage out to the lobster pots, *Hannah Lee* was in the company of another fishing vessel, to port and several nautical miles ahead of it, skippered by the son of *Hannah Lee*'s skipper. The two men had tuned their VHF radios to channel eight so they could communicate.

Just before 0535, *Hannah Lee*'s skipper stood up from where he had been sitting at the helm position. He looked up over the helm and saw 'a wall' (*Spartia*) in front of his vessel. Realising this was the side of a ship, he immediately swung the helm to port and was in the process of disengaging the autopilot when the two vessels collided. *Hannah Lee*'s starboard shoulder had struck *Spartia*'s hull.

After the collision

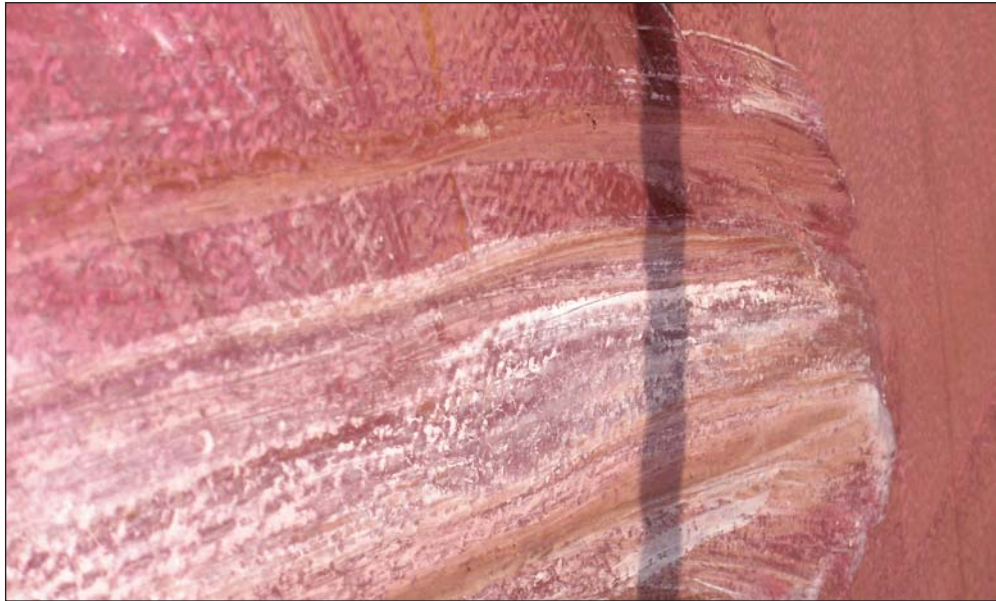
Spartia

After the collision, *Spartia* continued to turn to starboard. When the ship's heading was 277°(T), the master ordered port helm to bring the vessel back onto its previous course of 154°(T). The master and second mate stated that they continued to try to make contact with the fishing vessel immediately after the collision.

After the impact, the master and second mate stated that the fishing vessel continued to change its course to port. They saw a person come on deck and then retreat back into the vessel's wheelhouse. They further stated that the fishing vessel then turned off its navigation lights and quickly departed the location, heading to the north.

As it appeared that the fishing vessel was seaworthy and that its crew did not wish to establish communication, *Spartia*'s master ordered the ship to continue its voyage to Bunbury. The master stated that about half an hour after the collision, he tried to contact Bunbury harbour control by VHF channel 16 to advise them of the incident but received no reply. At about 0625, he contacted his managers in Greece and the Rescue Coordination Centre in Canberra (RCC Australia) to advise them of the collision and of the actions of the fishing vessel. *Spartia* arrived at the Bunbury pilot boarding ground at 0800 and anchored off the port at 0900.

FIGURE 3: Paint scrapings on *Spartia's* hull



Hannah Lee

The impact as the two vessels collided had knocked *Hannah Lee's* deckhands out of their bunks. Dazed, they came up into the wheelhouse and the skipper told them that:

‘I just slammed into a bloody ship!’

He instructed the crew to go below and check that the vessel was intact below the water line. The skipper took a torch and went out on deck and up to the bow to look at the damage. He then returned to the wheelhouse and was told by the deckhands that everything appeared secure below and that no water was entering the hull. The skipper continued to turn the vessel and ran with the wind to ensure that water did not enter the hull through the damaged section of bow.

When *Hannah Lee* was clear of the ship, and he was satisfied that no water would enter through the damaged section, the skipper set course for Fremantle. His intention was to immediately head for *Hannah Lee's* builder's yard. He states that he turned on two 1000W working spot lights, one facing forward and the other on the after deck when he had set course for Fremantle. The skipper began advising local authorities of the incident at about 0700 and arrived at the Fremantle Fishing Boat Harbour at 0910 on 15 April.

FIGURE 4: *Hannah Lee* damage to starboard bow



FIGURE 5: *Hannah Lee* damage



Evidence

On 16 April 2005, an investigator from the Australian Transport Safety Bureau (ATSB) attended *Hannah Lee* in Fremantle. The skipper was interviewed and provided an account of the incident. Both deckhands were down below sleeping during the time leading up to and during the collision. Therefore, the skipper's account of the collision is the only evidence relating to the course of events on board *Hannah Lee*.

Copies of relevant documentation and evidence was collected, including photographs of the damage, operation manuals, hours of work and survey information pertaining to the vessel. *Hannah Lee*'s ECS had the capability to record position and track information; however, this function was not in operation at the time of the incident. An examination of the damage was also made, although there was no requirement to take samples of paint transferred in the collision as the two vessels involved had been positively identified.

The investigator attended *Spartia* in Bunbury on 19 April, when it berthed after four days at anchor. Interviews were conducted with the master, the second mate and the helmsman on duty at the time of the collision. Copies of documents relevant to the collision were taken including, log book entries, course recorder trace, operating procedures, messages to and from the vessel after the incident, master's night and standing orders, and track and course information.

VHF recordings

Fremantle Port Authority routinely records transmissions made on VHF channel 16 by vessels operating within the Fremantle to Bunbury area. Copies of recordings of VHF transmissions made by *Spartia* were obtained from the Fremantle Port Authority to assist in the analysis of the incident.

On the morning of 15 April, only one transmission from *Spartia* was recorded at Fremantle. That transmission was at 0538 and was *Spartia* calling Bunbury Port Control:

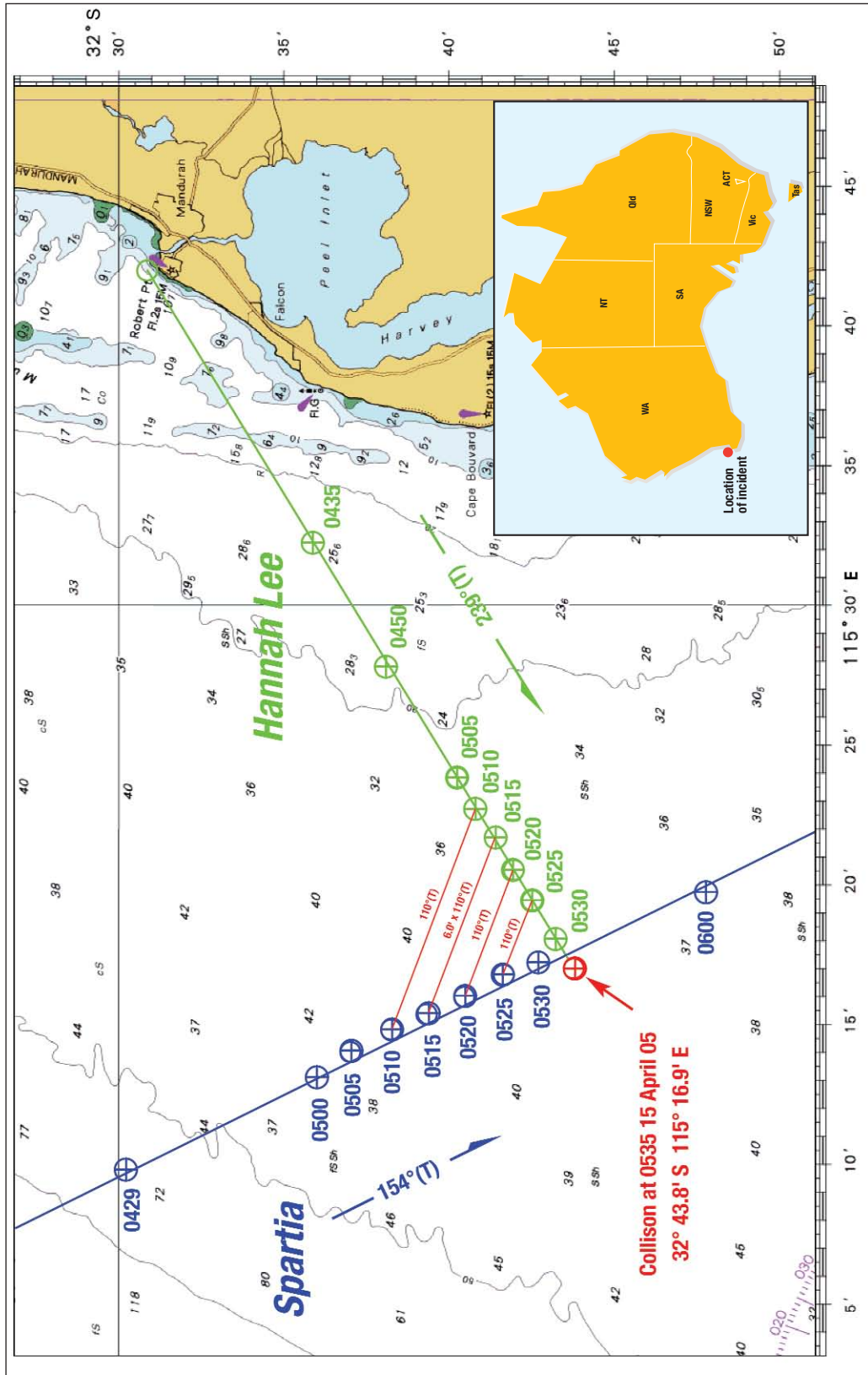
Bunbury Port Control, Bunbury Port Control, motor vessel *Spartia* is calling, motor vessel *Spartia* is calling.

There were no recordings of VHF transmissions made by *Spartia* prior to the collision. Had the bridge team transmitted calls to *Hannah Lee* on channel 16, in the period of time leading up to and after the collision, those transmissions would have been recorded by the Fremantle Port Authority.

In their submissions, both *Spartia*'s master and managers commented on the VHF recording. The master stated:

I do not know exactly why Fremantle P.A. did not record any of (the VHF calls). I assume that since at 05:00 hrs we were 45 nautical miles from Fremantle and sailing away from it maybe they were out of the vessel's antenna horizon or due to interference or both.

FIGURE 6: Portion of chart AUS 334 showing tracks of each vessel leading up to the collision



The Fremantle Port Authority's VHF antenna is located on the top of the port control tower, giving a far greater radio horizon than that of the ship. *Spartia's* one VHF transmission recorded at Fremantle was clear of interference or interruption, indicating a reliable recording of the transmission. The ship was at a greater distance from Fremantle when this transmission was made than it was when the stated transmissions were made prior to the collision.

Additionally, it appears that the master's recollection that he attempted to contact Bunbury about half an hour after the collision, at around 0600, was incorrect.

The absence of these recordings raises doubt about the reliability of the evidence provided by *Spartia's* bridge team regarding the use of their VHF radio.

The collision

Spartia and *Hannah Lee* collided at 0535 on 15 April 2005 in position 32° 43.8'S 115° 16.9'E, 17 nautical miles west of Cape Bouvard. This time and GPS position were recorded by the master of *Spartia*. *Hannah Lee's* skipper verified the time and general location as correct.

The location and the extent of damage to *Hannah Lee's* starboard bow indicates that the fishing vessel and *Spartia* were at an oblique angle at the point of impact and supports the skipper's assertion that he was turning to port when the collision occurred. The damage to *Hannah Lee* would have been significantly worse if its angle of attack with respect to the ship had been greater, given the speed of the fishing vessel at the time.

The location of the white paint deposited on *Spartia's* hull plating adjacent to number six hold indicates the fishing vessel's point of impact and is consistent with the observation of the master and second mate at the time.

Spartia's second mate stated that he identified two targets on radar at 0500, when the nearer of the two was about six nautical miles from the ship. Re-creation of the incident shows that the ship and the nearest vessel would have been six nautical miles apart at 0515 and therefore the second mate's recollection was incorrect. The re-creation also shows that, in the time leading up to the collision, *Spartia* and *Hannah Lee* remained on a steady relative bearing of about 110°(T). This equates to *Hannah Lee* being 44 degrees (four points) forward of *Spartia's* port beam. Therefore the master's and second mate's recollection that the smaller vessel identified at six nautical miles was about 22.5 degrees forward of the port beam was incorrect.

Hannah Lee's skipper said that he identified *Spartia* as a ship just seconds before the collision, when he was close enough to identify the ship's boot-topping. Given *Hannah Lee* was making a speed of 14.4 knots (7.4 m/s) at the time of the collision, it is likely that *Hannah Lee* would have been around 50 m (five to ten seconds before the collision) from the ship when the skipper looked up and saw it in front of his vessel. This distance allowed him only sufficient time to swing the helm to port and start to disengage the autopilot before the impact.

On 15 April 2005, visibility was reported to be 'fair' to 'good' by both crews. *Spartia's* crew estimated visibility to be about 12 nautical miles—they could see the loom of the shore lights to port. The sky was clear but there was no moonlight.

Sunrise occurred at 0640 with civil twilight from 0615. At 0535 when the collision occurred it would have still been dark.

It is matter of some concern that neither vessel stopped after the collision. *Spartia* resumed its original course and continued to steam away at full speed. *Hannah Lee* altered its course towards Fremantle and maintained full speed as it steamed away from the ship. No direct contact between the vessels occurred to establish whether assistance was required or to exchange details. *Spartia*'s bridge team state they attempted to contact the fishing vessel after the collision on VHF channel 16 but were unable to get a reply. Again, no VHF transmissions regarding this were recorded in Fremantle.

In submission, *Spartia*'s managers stated:

This, of course, is entirely correct procedure. However... despite subsequently 'doing the right thing', *Hannah Lee*'s initial reaction was not to wish to stop and be contacted at all. Attempts to contact *Hannah Lee* continued after the collision but as it was very clear the vessel did not wish to stop or be contacted, but was proceeding back to towards the coast at a constant and healthy speed, the master of *Spartia*, which had ascertained that it had suffered no material damage ... had to take a pragmatic decision to continue on to Bunbury rather than heave to, much less pursue the course of the unlit fishing vessel into the night.

On reflection, *Hannah Lee*'s skipper stated he should have talked to the ship to confirm that *Hannah Lee* and her crew were not in need of assistance. He stated that his priority at the time was to get the vessel to port as soon as he could.

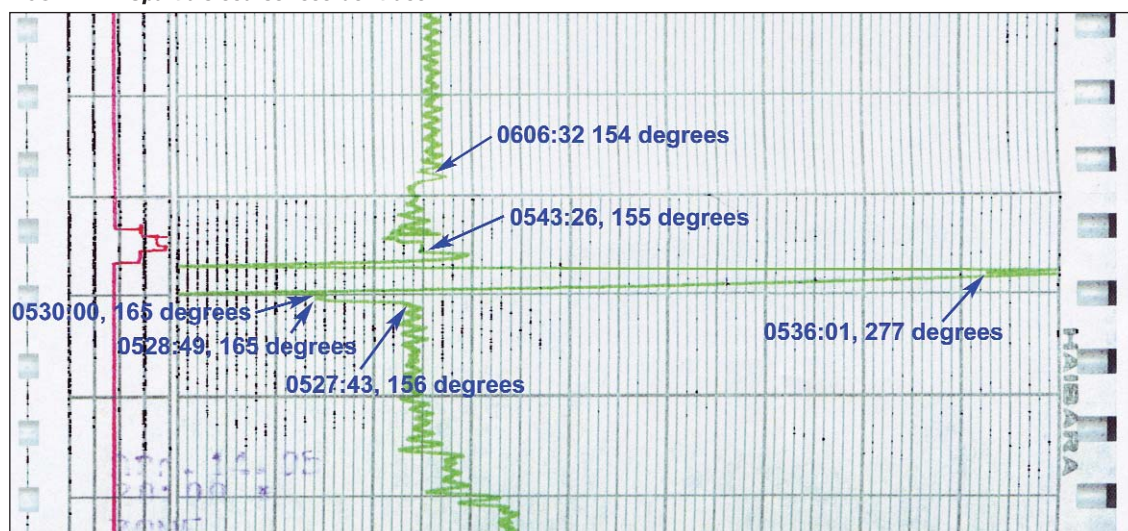
***Spartia*'s course recorder trace**

Analysis of the course recorder trace taken from *Spartia* shows that times recorded are 30 minutes fast. This is possibly a result of incorrect initiation when the vessel departed its last port of call.

The course recorder trace shows that a course alteration to starboard from 156°(T) (154°(T) plus two degrees for set/leeway) to approximately 165°(T) took place at 0527:43. The vessel steadied on 165°(T) for about 1.2 minutes.

At 0530:00, a turn was initiated by the application of starboard rudder which brought the ship to a heading to 277°(T). This heading was reached at 0536:01, shortly after the collision. The rate of turn of *Spartia* from 165°(T) to 277°(T) was calculated to be 19 degrees per minute. Information obtained from the ship's manoeuvring diagram indicated that the ship can achieve a rate of turn in the vicinity of 50 degrees per minute (in ballast, on full sea speed in winds of less than 10 knots) with full starboard helm on. Considering the circumstances of this case, a rate of turn of 19 degrees per minute is relatively slow.

FIGURE 7: *Spartia's* course recorder trace



At a rate of turn of 19 degrees per minute, the radius of the ship's turning circle would be approximately 0.7 nautical miles. This means that *Spartia's* advance⁶ would have been in excess of this amount, possibly up to the same distance the two vessels were apart when the master states he ordered the course alteration. Had the helm be put hard over to starboard when the master claims it was, at 0527:43, *Spartia's* advance would have been less than 0.7 nautical miles, possibly as low as 0.3 nautical miles and probably enough to avoid contact with *Hannah Lee*.

At 0536:01, the ship's course was then brought back to port and by 0543:26, *Spartia's* helmsman was beginning to steady the ship up on the original course of 154°(T). By 0606:32, *Spartia* had resumed its original heading of 154°(T).

In conclusion, the analysis of the course recorder trace indicates that the manoeuvre undertaken by *Spartia* to avoid the collision consisted of an alteration of course by ten degrees to starboard, then a relatively slow turn of 19 degrees per minute to starboard.

Lookout

The COLREGS '... apply to all vessels upon the high seas and in all waters connected therewith navigable by seagoing vessels.'

The regulations contain specific requirements for keeping a lookout and actions to avoid collisions. Rule 5 'Lookout' states:

Every vessel shall at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and the risk of collision.

In the case of the collision between *Spartia* and *Hannah Lee*, the crew on both vessels were obliged to maintain a proper lookout by all appropriate means and thereby avoid a collision.

⁶ Distance between the position at which a vessel commences to alter course and the position at which it is on a course 90 degrees opposed to its original course. It is measured along a line parallel to its original course.

Hannah Lee

Hannah Lee sailed from Mandurah with the skipper on watch. With the two deckhands below sleeping, he was the only person able to keep a lookout while the vessel was en route to its first line of lobster pots.

With the sea state as it was, there was an amount of sea spray building up on the outside of the wheelhouse windows during the voyage. *Hannah Lee* was not equipped with any means of cleaning the windows and therefore the spray build up limited a clear view from the wheelhouse.

The skipper was navigating using a 'C-Plot' ECS. He was not using any pre-entered routes in the ECS, merely setting a course line on the display after clearing Mandurah which would take the vessel to the lobster pots. As the ECS was not interfaced with the autopilot, the skipper had to continually monitor *Hannah Lee's* position and make frequent adjustments to the heading set on the autopilot to stay on the ECS course line. This meant that much of the skipper's attention was focused on the autopilot and ECS after leaving Mandurah. In his statement, he said that he did not properly lookout the wheelhouse windows and did not know there was any traffic in the vicinity, with the exception of his son's vessel.

The first time the skipper was aware of the presence of *Spartia* was immediately before the two vessels collided when he looked up over the helm position and saw 'a wall'. It can only be concluded that in the time leading up to the collision, the skipper's visual lookout from *Hannah Lee's* wheelhouse was manifestly inadequate.

Radar – *Hannah Lee* was equipped with radar, but at the time of the collision, it was not operating. A fault with the unit's magnetron caused a certain component to overheat. This in turn caused the unit to cease operating.

While there was no requirement under WA marine legislation for *Hannah Lee* to carry radar, or for the unit to be operational if fitted, radar is an invaluable aid in determining the risk of a collision. Had *Hannah Lee's* radar been operational, the skipper probably would have been aware of *Spartia's* proximity and taken action to avoid the collision.

Radio – When *Hannah Lee* sailed, the VHF radio was on but tuned to channel eight. The skipper and his son used this channel as an inter-ship frequency. In the time prior to the collision on 15 April, the skipper's son had tried to contact him using the VHF radio. However, the radio's volume was apparently turned down and his call was not heard above the noise made by *Hannah Lee's* engine.

Hannah Lee's VHF radio did not have the facility to monitor channel 16 and another channel simultaneously. As such, the skipper would not have heard any calls on VHF channel 16 that may have been made by *Spartia* to alert *Hannah Lee* to the ship's presence.

Hannah Lee's MF/HF radio was also turned on but it was monitoring a local fishing vessel frequency, 4535 kHz. Any attempts by *Spartia* to alert *Hannah Lee* by MF/HF using the GMDSS emergency frequencies would not have been heard on board *Hannah Lee*.

The skipper did not make allowance for the failure of the radar, an important collision avoidance aid, the noise coming into the wheelhouse from the engine as a result of the wheelhouse door being open or the limited visibility resulting from the build up of salt on the wheelhouse windows.

On the balance of the evidence, it can only be concluded that the skipper's lookout in the wheelhouse of *Hannah Lee*, with respect to sight, radar and hearing in the period leading up to the collision was inadequate, ineffective and, in the minutes immediately prior to the collision, non-existent. It certainly did not comply with the practice of good seamanship.

In submission, *Hannah Lee*'s owner/skipper stated that since the collision he has fitted a clearview to the front window, replaced the autopilot and interfaced it with the ECS, replaced the VHF radio with a new unit that monitors channel 16 and another channel simultaneously. He also stated that:

I will now be making sure that each of my crew will take it in turns to keep watch with me.

Spartia

The team on *Spartia*'s bridge in the time leading up to the collision consisted of the master, second mate and a lookout. All three men were maintaining a visual lookout and the master and second mate were also using both radars to track the vessels in the area.

According to the statements of the bridge team, ARPA information indicated about 35 minutes prior to the collision that the two vessels were on a collision course. In the time leading up to the collision, continued observation of the radars confirmed that *Hannah Lee* did not alter its course and/or speed.

The second officer stated that, at no time leading up to the collision, did he take any visual bearings of the fishing vessel in order to confirm the information being presented to him by the radars. He also did not see the master take any visual bearings.

In their submissions, *Spartia*'s master and managers stated that, in accordance with standard practice, visual bearings of the approaching vessel were taken from the port bridge wing gyrocompass repeater. These bearings concurred with the radars' indications.

Based on the statements made by the bridge team, the actions of the second mate and the master, in identifying the risk of collision were consistent with good navigational practice. While the actual time of detection (0500 as opposed to 0515) may have differed from the statements made by the bridge team, they were in compliance with the provisions of Rule 5 of the COLREGS in that they had identified the fishing vessel and had used the radar correctly to assess the risk of collision.

Actions to avoid a collision

There is an obligation on all vessels at sea to take appropriate actions to avoid a collision.

On the morning of 15 April, a 'crossing situation' existed between *Spartia* and *Hannah Lee*. In this case, *Hannah Lee*, with the other vessel on its starboard side, was the 'give-way' vessel and *Spartia* was the 'stand-on' vessel, as defined in the COLREGS. As such, under Rule 15, the first responsibility for taking avoiding action rested with *Hannah Lee*. However, there was still an onus on *Spartia* to take any necessary action to avoid a collision (Rules 2 and 17).

That a collision occurred at all means that there was a failure on the part of both vessels.

Spartia

Initially those on *Spartia's* bridge could have reasonably expected the fishing vessel to keep clear. It had a clear duty to do so. In busy waters, fishing vessels and large ships pass very close to each other. In such waters the risks of collision are much more obvious, the room for large ships to manoeuvre is often more limited and, in general, there is a heightened level of alertness. Australian waters, however, are relatively lightly trafficked, and in this case, *Spartia* had plenty of sea room.

Spartia's bridge team stated that they had been tracking *Hanna Lee* on both of the ship's radars from about 0500. Over the next twenty minutes, the ship's radars indicated that the fishing vessel was on a steady relative bearing and that a risk of collision existed. When it became apparent that the fishing vessel was not taking any action to give-way, *Spartia's* bridge team attempted to alert the fishing vessel using internationally accepted means i.e. VHF channel 16, followed later by the use of the Aldis lamp and the forward whistle. At this time the fishing vessel was three to four nautical miles off (more than ten minutes before the collision) and the bridge team's initial actions were consistent with its responsibilities as the 'stand-on' vessel.

When *Hanna Lee* subsequently failed to show that they had seen or heard *Spartia's* calls, there should have been sufficient time allowed for the ship to take immediate and substantial action to avoid the collision in accordance with COLREGS Rule 17 (a) (ii). Although it is a matter of judgement when a stand-on vessel must take action to avoid a collision, factors such as the amount of available sea room and the stand-on vessel's manoeuvrability must be taken into consideration. *Spartia's* master said he ordered full starboard rudder when the collision was imminent. This action was taken too late, given that the ship had been tracking *Hannah Lee* on a steady course and speed for up to 30 minutes and no change in course or speed was detected on either radar.

Aldis lamp and whistle – When the range between the two vessels had closed to approximately three nautical miles, the second mate on *Spartia* indicated that he had used the aldis lamp on the port bridge wing to signal *Hannah Lee*. *Hannah Lee's* skipper stated that he did not see any light from outside the wheelhouse in the time prior to the collision. Light from an aldis lamp would have been easily visible in the wheelhouse had his lookout been even cursory. However, he did recall seeing a 'narrow beam of light' from the ship immediately after impact, when he looked astern to be sure that the aft end of his boat did not hit the ship during turn.

Spartia's second mate and master stated that they had started to sound the ship's forward whistle when the range between the two vessels had closed to approximately three nautical miles. The COLREGS stipulate that *Spartia's* forward whistle (as a vessel more than 200 m in length) is audible for a minimum range of two nautical miles ahead of the vessel in conditions of still air.

With the wind coming from ahead, on *Spartia's* bow, the conditions were not conducive for *Hannah Lee's* skipper to hear the whistle at the two nautical mile range. Allowing for the reported wind strength and direction, the whistle was probably only clearly audible for a range of up to one nautical mile in *Hannah Lee's* direction, meaning that the skipper would only have been able to hear the whistle

from about 0530. However, at one nautical mile, there probably would have been time for *Hannah Lee*'s skipper to take avoiding action, had he heard the whistle.

Hannah Lee's skipper stated that the wheelhouse door was open while he was sitting in the wheelhouse in the time leading up to the collision. The loud noise coming from the engine, through an open hatch, would have effectively masked the sound of *Spartia*'s whistle until the fishing vessel was very close to the ship. Had the skipper heard and identified this warning from the ship, even at a range of considerably less than half a mile, the collision could have been avoided. Thus, the engine noise in the wheelhouse inhibited the skipper's ability to maintain an effective lookout using his hearing.

Hannah Lee

The skipper of *Hannah Lee* had no appreciation of the situation that was developing with *Spartia*. He did not know of the ship's presence until immediately before the collision. By that time, collision was imminent and unavoidable.

His response to the situation was to turn the fishing vessel hard to port and to try to disengage the autopilot. The skipper's actions in the time leading up to the collision were not in accordance with the COLREGS which state that

the give-away vessel in a crossing situation...shall, so far as possible, take early and substantial action to keep well clear.

The skipper's actions were far too late to avoid a close quarters situation as a direct result of his ineffective lookout and poor situational awareness at the time.

The skipper's last minute alteration to port was not in accordance with the COLREGS which normally dictate that the 'give-way' vessel should alter course to starboard in a 'crossing situation'. However, given the close proximity of the ship, each vessels' heading, the point of impact on the ship and the speed and rate of turn of the fishing vessel at the time; the skipper's action in turning to port rather than starboard was probably correct. Had he turned to starboard, it is likely that the fishing vessel would have impacted more squarely on the ship's after end with significantly more damage to both vessels.

Speed

The bridge team on *Spartia* did not make the decision to slow their vessel in the time leading up to the collision. Rule 8 of the COLREGS state:

If necessary to avoid collision or allow more time to assess the situation, a vessel shall slacken her speed or take all way off by stopping or reversing her means of propulsion.

Spartia as the stand-on vessel, was obliged to maintain course and speed until such time as it became apparent that *Hannah Lee* was not taking the appropriate action to avoid a collision. Given the speed of *Hannah Lee* and the relatively long time taken to slow *Spartia*, it is unlikely that a decision by the master to slow the ship, when it became reasonably apparent that *Hannah Lee* was not going to give way, would have prevented the collision. The bridge team expected that the fishing vessel had already, or would in sufficient time, identify the ship. They judged that any action to avoid a collision on the part of the much more manoeuvrable *Hannah Lee* would have been effective up to the time that the two vessels were at relatively close quarters.

Given the bridge team's assessment of the situation (which was reasonable), it is unlikely that they seriously considered slowing the ship at a time early enough to be effective, preferring to use the option of the course alteration at a later stage.

With respect to his vessel's speed, it is doubtful that the skipper of *Hannah Lee* would have had time to make a full astern movement when he identified the ship. Whether he could have stopped *Hannah Lee* in time to avoid the collision, is doubtful; however, it appears that this option did not occur to him at the time.

Hannah Lee's radio watch

While the evidence suggests that it is probable that no VHF transmissions on channel 16 were made by the crew of *Spartia* prior to the collision, had *Hannah Lee's* skipper heard a radio call from the ship it is likely that the collision would have been avoided.

A recommendation arising from ATSB Marine Safety Investigation Report number 163 into the 2001 collision off the WA coast between the merchant ship *Handymariner* and the rock lobster fishing vessel *Lipari* stated that:

All State and Territory registered commercial vessels operating offshore be required to carry an operational VHF radio capable of maintaining a continuous watch on 156.8 MHz (channel 16).

The *W.A. Marine (Radiotelephony) Regulations 1981* have not been amended to reflect the above recommendation.

The WA radiotelephony requirements for commercial vessels are contained in the above regulations. Regulation 5 states that vessels such as *Hannah Lee* with an operational area more than 20 nautical miles from a coastal radio station must be equipped with a single side band MF/HF radio capable of receiving and transmitting on 2182, 4125 and 6215.5 kHz (GMDSS emergency frequencies). There is still no requirement for an additional VHF radio on such vessels registered in Western Australia. On the morning of 15 April, *Hannah Lee* complied with the relevant statutory requirement as the vessel was fitted with a MF/HF radio, in addition to a VHF radio.

VHF radio is the accepted standard method of radio communication between vessels at sea in reasonably close proximity (up to 20 nautical miles or so). All SOLAS vessels are obliged to carry VHF radios and maintain a listening watch on channel 16. Since the introduction of GMDSS, the 2182, 4125, 6215.5 kHz MF/HF radio frequencies are no longer routinely used or monitored by ships. For practical purposes, it is now very difficult for another vessel to make radio contact with a ship using conventional (non-GMDSS) MF/HF radio equipment. Likewise it is highly unlikely that a ship would attempt to call another vessel in its immediate area using the 2182, 4125, 6215.5 kHz MF/HF radio frequencies.

For practical purposes, most commercial vessels operating more than 20 nautical miles from a coastal radio station are fitted with VHF radio, regardless of the lack of a statutory requirement to do so.

Hannah Lee's skipper's certification

Hannah Lee's skipper held the required certificate of competency for a vessel of *Hannah Lee's* size and operating area, and he had done so since 1972. In his

statement, he admitted that he did not have a full knowledge of the contents of the COLREGS.

The skipper had extensive experience navigating fishing vessels over a very long period of time. Given this experience, there is little doubt that he had a reasonably good understanding of what manoeuvres were required (by the COLREGS) in certain situations. However, his limited knowledge of the contents of the regulations probably meant that he did not fully understand his obligations as the skipper of a power driven vessel.

His lack of knowledge of the COLREGS at the time of the collision could have been addressed had there been some form of continuous professional development in place prior to the incident. The need to keep knowledge current is addressed in commonwealth certificate of competency holders by a five year revalidation requirement.

The skipper's Skipper Grade 2 certificate was issued in perpetuity and since its issue his competence had not been periodically checked by any authority. Current WA marine legislation, (as is the case in most other states and territories), mandates Section 3 of the Uniform Shipping Laws (USL) Code, 'Qualifications and Manning, Fishing Vessels'. Under the provisions of Section 3, certificates of competency issued in perpetuity do not require periodic revalidation. The only time the holder of a perpetual certificate can be required to demonstrate the knowledge required to hold their certificate of competency is if they come to the attention of the regulator as the result of an incident, or some other means.

Part D of the new National Standard for Commercial Vessels (NSCV), 'Crew Competencies', will replace Section 3 of the USL Code when its provisions are mandated in due course by legislation in the various states. The NSCV contains a requirement for Skipper Grade 2 certificates, issued under the standard, to be revalidated every five years. Current holders of perpetual certificates will be subject to 'grandfather' provisions and will still not be required to demonstrate their suitability to hold their certificate under any future legislation if State and Territory marine regulators mandate the NSCV alone.

Fatigue

Fatigue may be described as a reduction in physical and/or mental capability as a result of physical or emotional exertion which may impair nearly all physical abilities including, strength, speed, reaction time, coordination and decision making. Fatigue can be described as acute or chronic. Acute fatigue occurs in a matter of hours as the result of excessive mental or physical activity and may be cured by a period of rest or sleep.

A state of chronic fatigue is reached when the 'normal' period of rest or sleep is insufficient to restore an individual's working performance to its usual level. Chronic fatigue is insidious and usually develops over a period of time. Individuals suffering from chronic fatigue always perform below their personal best but are often unaware that their performance has been significantly degraded. In the worst case, chronic fatigue can drive an individual to sleep while at work often in the form of a momentary event or 'micro-sleep' which may last a few seconds or several minutes.

Hannah Lee's skipper

Prior to the morning of the collision, *Hannah Lee*'s crew had spent several months fishing following the opening of the rock lobster fishing season in November 2004. The skipper indicated that a routine had been established with the vessel leaving port early each morning to arrive at the fishing grounds to commence checking the lobster pots around dawn each day.

For the two weeks prior to the incident, the lobster pots had been set in waters some 37 nautical miles from Mandurah. *Hannah Lee* had been leaving port at around 0345 each day. After clearing the pots, the vessel travelled to Fremantle, where the catch was discharged. *Hannah Lee* then returned to Mandurah, arriving at around 1600, and the crew were then free to go home and rest if there was no maintenance to do on the vessel. The skipper indicated that occasionally he took a day off from fishing to work on his other boat, and to prepare it for sale.

Fatigue analysis

The skipper provided details of his hours of work and rest in the seven days prior to collision. He indicated that these hours were representative of his routine. The skipper worked an average of 12 hours per day for this period. It was his practice to go to bed between 2030 and 2100 and rise between 0300 and 0330. This meant that in the week prior to the collision, the skipper had had between six hours and seven hours sleep each night. His last day off from fishing was 13 April.

The skipper's work and rest routine was analysed using InterDynamics' Fatigue Audit InterDyne (FAID) (software developed in conjunction with the Centre for Sleep Research at the University of South Australia) to assess his level of fatigue at the time of the collision.

FAID is primarily a rostering tool, which calculates a 'score' for an individual's level of fatigue at a given time, based on their rostered tasks. These calculations take into consideration four factors that have emerged from research into shiftwork and fatigue over several decades. The specific determinates of work-related fatigue which FAID takes into account are:

1. the time of day of work and breaks;
2. the duration of work and breaks;
3. work history in the preceding seven days; and
4. the biological limits on recovery of sleep.

FAID does not make allowance for mode-specific environmental factors such as noise, age, medical condition, light, vibration or the proximity to the workplace of ship's crews. No allowance is made for any activity outside work hours such as domestic tasks or any required maintenance routines.

FAID results are given as an index score. The scores are interpreted as follows:

- < 80 work related fatigue is unlikely
- >80 to <100 **some** people will show signs of fatigue impairment on **some** tasks
- >100 all people are likely to be impaired in any task⁷

Research by the Centre for Sleep Research indicates that a fatigue score of 40 to 80 is moderate, 80 to 100 is high, and scores of 100 to 120 are very high.

A study conducted by the Centre for Sleep Research, following the development of the FAID program, states that:

the impairment observed in an individual working with a fatigue score between 80 and 100 is comparable to the impairment of an individual intoxicated with alcohol to a blood alcohol content of 0.05% or greater.

Such a level of alcohol related impairment would not be acceptable at work.

To examine the skipper's fatigue level at the time of the incident, two FAID scenarios were considered. The first scenario uses only his actual working hours on the vessel as the input, based on the assumption that in any time off he had the opportunity to take rest. The second scenario uses all of his waking hours as the input parameters. The actual score probably lies somewhere between these two scenarios.

The first FAID scenario shows an index score of 109, immediately prior to the collision. The second scenario score was 149. These fatigue scores are considered to be in the very high range.

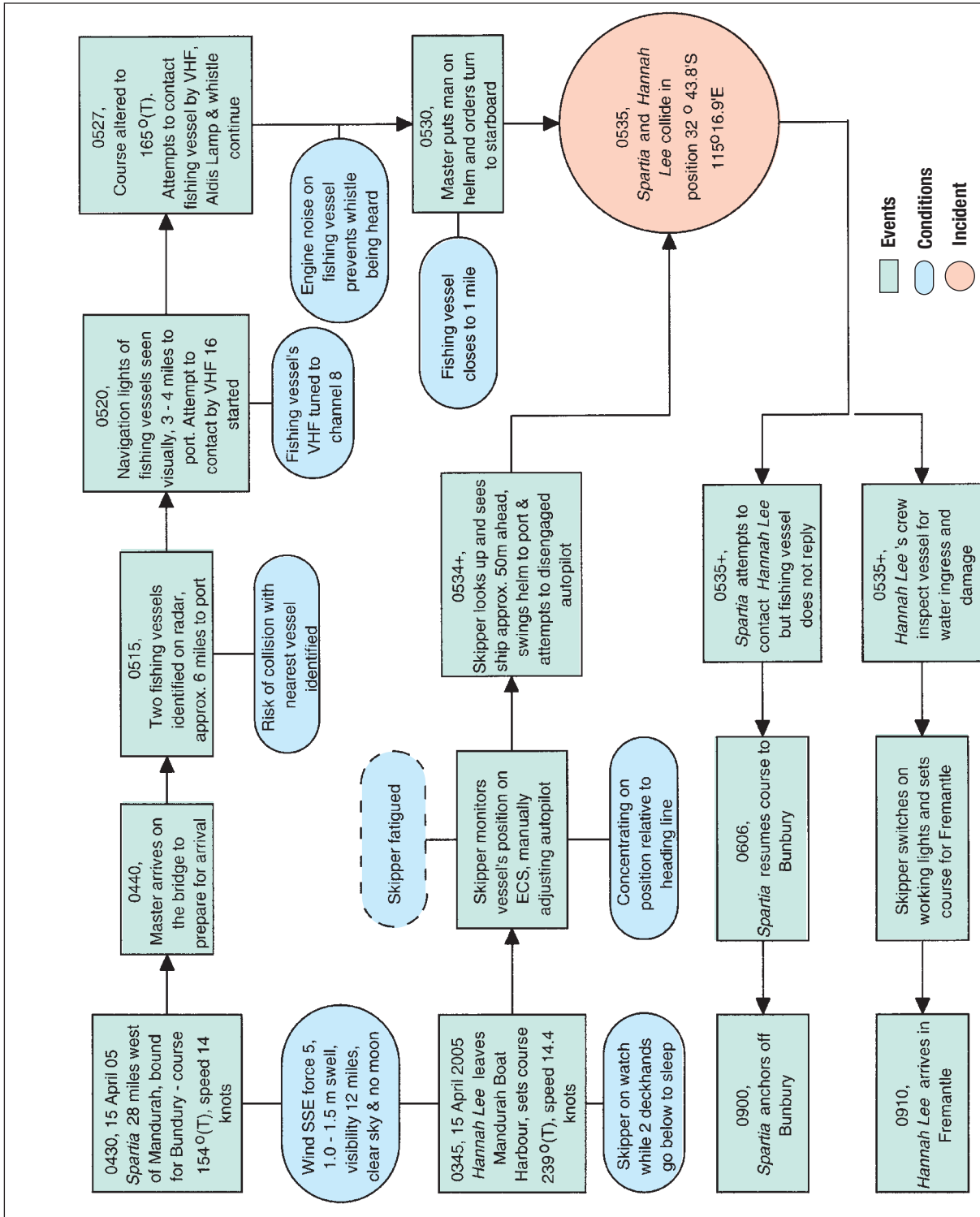
Based on the skipper's working routine and his time awake, it is reasonable to conclude that on the morning of 15 April, the skipper's judgement, actions and situational awareness were affected by fatigue.

***Spartia's* bridge team**

Analysis of the working hours of the master and second mate preceding the collision reveals no evidence to suggest that the actions or decisions of any of the men on *Spartia's* bridge were significantly affected by fatigue in the time leading up to the collision.

⁷ Professor Drew Dawson – Centre for Sleep Research, University of South Australia.

FIGURE 8: Spartia/Hannah Lee: Events and causal factor chart.



5 CONCLUSIONS

These conclusions identify the different factors that contributed to the incident and should not be read as apportioning blame or liability to any particular individual or organisation.

Based on the available evidence, the following factors are considered to have contributed to the collision between *Spartia* and *Hannah Lee* at 0535 on 15 April 2005:

1. The visual lookout being maintained on board *Hannah Lee* was inadequate, ineffective and in the minutes prior to the collision, non-existent.
2. The VHF on board *Hannah Lee* was not tuned to the internationally accepted distress and calling frequency, channel 16.
3. Engine noise emanating from the rear of the wheelhouse prevented *Hannah Lee*'s skipper hearing any sound signal from *Spartia*'s forward whistle.
4. A non-operational radar prevented *Hannah Lee*'s skipper from detecting *Spartia* by this means in the time leading up to the collision.
5. *Hannah Lee*'s skipper did not have the required knowledge of the COLREGS and his obligations under them.
6. It is probable that *Hannah Lee*'s skipper's judgement, actions and situational awareness were affected by fatigue as a result of his work routine and waking time activities over the previous week.
7. The decision by *Spartia*'s master to take avoiding action when *Hannah Lee* was one nautical mile away was too little and made too late.

It is also considered that:

8. VHF recordings from the Fremantle Port Authority indicate that it is probable that *Spartia*'s bridge team did not attempt to use VHF channel 16 to alert *Hannah Lee* to the presence of the ship in the period of time leading up to the collision, despite their claim to the contrary.
9. Both vessels should have stopped and established contact as soon as possible after the collision.

6 RECOMMENDATIONS

MR20050019

All State and Territory registered commercial vessels operating offshore should be required to carry an operational VHF radio which is capable of maintaining a continuous watch on channel 16 (156.8 MHz) and, if required for vessel operations, another channel.

MR20050020

Skippers of commercial State and Territory registered vessels should ensure that they have a full understanding of the COLREGS and their obligation under those regulations, with particular regard to keeping a lookout and actions to avoid a collision.

MR20050021

State and Territory marine regulatory authorities should consider amending their policy and regulations with regard to perpetual certificates of competency with a view to implementing a revalidation process consistent with the requirements of the National Standard for Commercial Vessels.

MR20050022

State and Territory marine regulatory authorities, through the National Marine Safety Committee, and in consultation with the Australian Seafood Industry Council, should ensure the safety and welfare of fishing vessel crews by reviewing work practices on Australian fishing vessels with a view to establishing guidelines for the management of crew fatigue.

7 SUBMISSIONS

Under Part 4, Division 2 (Investigation Reports), Section 26 of the *Transport Safety Investigation Act 2003*, the Executive Director may provide a draft report, on a confidential basis, to any person whom the Executive Director considers appropriate. Section 26 (1) (a) of the Act allows a person receiving a draft report to make submissions to the Executive Director about the draft report.

Copies of the final draft of this report were sent to the owner/skipper of *Hannah Lee*, the owners, master and second mate of *Spartia*, the WA Department for Planning and Infrastructure – Marine Safety and the Australian Maritime Safety Authority.

Submissions were included and/or the text of the report was amended where appropriate.

IMO number	9217644
Call sign	SYDH
Flag	Greek
Port of registry	Piraeus
Classification society	Lloyds Register of Shipping (LR)
Ship type	✘100 A1 bulk carrier, strengthened for heavy cargoes, ✘LMC UMS
Builder	Hitachi Zosen Corporation, Maizuru, Japan
Year built	2000
Owners	Fowler Transportation E.N.E., Piraeus, Greece
Managers	Neda Maritime Agency Company, Piraeus, Greece
Gross tonnage	39 783
Net tonnage	25 329
Deadweight (summer)	75 115 tonnes
Maximum draught	13.841 m
Length overall	225.00 m
Length between perpendiculars (LBP)	217.00 m
Moulded breadth	32.20 m
Moulded depth	19.15 m
Engines	1 x Hitachi Zosen B&W 6S60MC (Mark VI) diesel
Total power	10 750 kW (14 610 HP)
Number of propellers	1 x seven metre right hand, four bladed fixed pitch
Service speed	14.0 knots
Crew	22 (13 Greek, 8 Filipino, 1 Polish)

Registration number	LFBM 67
Call sign	VNW5320
Flag	Australian
Home port	Mandurah, WA
Survey authority	WA Department for Planning and Infrastructure
Vessel type	Rock lobster fishing vessel (USL Code Class 3B)
Builder	Marko's Slipways, Fremantle, WA
Year built	1995
Construction	Bondwood ply, single chine monohull
Gross tonnage	24
Length overall	16.65 m
Breadth	4.90 m
Depth	1.70 m
Engines	1 x 10 cylinder turbocharged M.A.N. D2840LF401 diesel
Total power	603 kW
Service speed	17.0 to 21.0 knots
Crew	Three

10 ABBREVIATIONS, TERMS AND DEFINITIONS

Definition

Deadweight	The weight of cargo, fuel, fresh water and stores that a vessel can carry at a relevant draught.
Gross tonnage	Measurement of total internal volume of a vessel, including all underdeck tonnage and all enclosed spaces above tonnage deck.
Net tonnage	Measurement derived from gross tonnage by deducting spaces allowed for crew and propelling power.
Length overall (LOA)	The length of a vessel, measured from the extremities at the stem and stern.
Length between perpendiculars (LBP)	The distance, at the summer waterline, from the forward side of the stem to the after side of the rudder post.

**Independent investigation into the collision between the
Greek registered bulk carrier *Spartia* and the Australian fishing vessel *Hannah Lee*
off the south-west coast of Western Australia on 15 April 2005**

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