ACCIDENT REPORT

Report on the investigation of the collision between

Seagate

and

Timor Stream

24 nautical miles north of the Dominican Republic

on 10 March 2012 at 0540 local time

MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

SERIOUS MARINE CASUALTY | REPORT NO 17/2013 | JUNE 2013

Extract from

The United Kingdom Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2012 – Regulation 5:

"The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

NOTE

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

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	-	Able Bodied Seaman
ABOT	-	Able Seaman Officer Trainee
AIS	-	Automatic Identification System
ARPA	-	Automatic Radar Plotting Aid
BV	-	Bureau Veritas
Cable	-	0.1nm or 185.2m
CBT	-	Computer Based Training
CoC	-	Certificate of Competency
COLREGS	-	International Regulations for Preventing Collisions at Sea 1972 (as amended)
CPA	-	Closest Point of Approach
DPA	-	Designated Person Ashore
EBL	-	Electronic Bearing Line
ECS	-	Electronic Chart System
GmbH	-	Gesellschaft mit beschrankter Haftung (company with limited liability – Germany)
GMDSS	-	Global Maritime Distress and Safety System
GPS	-	Global Positioning System
GT	-	Gross Tons
IMO	-	International Maritime Organization
ISM	-	International Safety Management
kW	-	kilowatt
LOA	-	Length Overall
LPG	-	Liquefied Petroleum Gas
m	-	metre(s)
“Mayday”	-	The International Distress Signal (spoken)
MGN	-	Marine Guidance Notice

NKK	-	Nippon Kaiji Kyokai
nm	-	Nautical mile
N.V.	-	Naamloze Vennootschap (company with public limited liability – Belgium)
OOW	-	Officer of the Watch
OS	-	Ordinary Seaman
SMS	-	Safety Management System
SOLAS	-	Safety of Life at Sea
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
TCPA	-	Time to closest point of approach
UK	-	United Kingdom
USA	-	United States of America
USCG	-	United States Coast Guard
UTC	-	Co-ordinated Universal Time
VDR	-	Voyage Data Recorder
VHF	-	Very High Frequency
Zodiac	-	Zodiac Maritime Agencies Limited

TIMES: All times in this report are UTC -4 hours unless otherwise stated.

SYNOPSIS

At 0540 on 10 March 2012, the bulk carrier *Seagate* and the refrigerated-cargo ship *Timor Stream* collided while transiting open waters, in good conditions of visibility, 24 nm north of the Dominican Republic. There were no injuries, but both ships were badly damaged and there was some minor pollution.

Timor Stream left port 3 hours before the collision and was proceeding to the United Kingdom; *Seagate* was on passage to the west coast of Africa. *Seagate*'s chief officer saw *Timor Stream* but assumed it was an overtaking vessel which would keep clear of *Seagate*. The master of *Timor Stream*, who was alone on the bridge, was not keeping an effective lookout. Neither watchkeeper realised that the two vessels were on a collision course until less than a minute before the accident.

Poor watchkeeping standards, driven by complacency, led to the collision. The officer in charge of the navigational watch on both vessels failed to keep a proper lookout, did not assess the risk of, or take appropriate action to avoid collision. In summary, both officers failed to comply with some of the most fundamental elements of the International Regulations for Preventing Collisions at Sea 1972 (as amended) and the written navigational procedures issued by their respective company managers.

The managers of both vessels have taken action designed to prevent similar accidents in the future which address the safety issues identified in the MAIB's investigation. Accordingly, no recommendations have been issued with this report.

SECTION 1 – FACTUAL INFORMATION

1.1 PARTICULARS OF *SEAGATE*, *TIMOR STREAM* AND ACCIDENT

SHIP PARTICULARS		
Vessel's name	*Seagate*	*Timor Stream*
Flag	British	Liberian
Classification society	Nipon Kaiji Kyokai (NKK)	Bureau Veritas (BV)
IMO number	8905488	9172947
Type	Geared bulk carrier	Refrigerated-cargo ship with containers on deck
Registered owner	Burnley Shipping Enterprises Ltd	Timor Stream Schiffahrts GmbH
Manager(s)	Zodiac	Triton Schiffahrts GmbH
Construction	Steel	Steel
Length overall	170.02m	150.0m
Registered length	162.5m	140.18m
Gross tonnage	17,590	9,307
Minimum safe manning	17	14
Authorised cargo	No	No
VOYAGE PARTICULARS		
Port of departure	Beaumont, Texas, USA	Manzanillo, Dominican Republic
Port of arrival	Lagos, Nigeria	Portsmouth, United Kingdom
Type of voyage	International	International
Cargo information	Wheat	Refrigerated bananas and general cargo in containers

MARINE CASUALTY INFORMATION		
Date and time	10 March 2012, 0540 local time	
Type of marine casualty or incident	Serious Marine Casualty	
Location of incident	24nm north of Dominican Republic, 20° 18.4N 071° 38.9W	
Place on board	Not applicable	Not applicable
Injuries/fatalities	Nil	Nil
Damage/environmental impact	12500 litres of diesel oil + 5500 litres of lubricating oil	Nil
Ship operation	On passage	On passage
Voyage segment	Mid-water	Mid-water
External environment	Wind NNE Force 3. Cloudy with occasional rain. Moderate swell.	
Persons on board	21	20

Photograph courtesy of www.FotoFlite.com

Seagate

Timor Stream

1.2 NARRATIVE

1.2.1 Events leading to the collision

On 3 March 2012 *Seagate* departed Beaumont, Texas, United States of America (USA), with a cargo of wheat for carriage to Lagos and Warri, Nigeria.

At 0248 on 10 March *Timor Stream* departed Manzanillo in the Dominican Republic, its final Caribbean port call, with a cargo of refrigerated bananas and a deck cargo of containers bound for Portsmouth in the United Kingdom (UK). Immediately after departure the crew carried out a stowaway search. This was completed at 0325 and the chief and second officers, who had both previously been busy with cargo operations, went to the bridge and reported their findings to the master. The bridge watchkeeping system was in transition from a routine for the vessel's frequent Caribbean port calls to one more suited for the long ocean passage. The master decided that he was best placed to take the bridge watch. He released the two officers to go to their beds and remained alone on the bridge. A lookout was available, but the master decided not to call him.

Seagate's chief officer, assisted by an Ordinary Seaman (OS) as lookout, took over the bridge watch on his vessel at 0400. It was reported that *Seagate* was on an auto-pilot heading of 104º at a speed of 10.8 knots.

At 0416 *Timor Stream*'s master set an auto-pilot heading of 043º and a speed of 19.5 knots for the 3,592nm track across the Caribbean Sea and Atlantic Ocean **(Figure 1)**. At 0441, the master sent a standard departure email **(Annex A)** to the ship's managers and other interested parties from a computer located on the starboard side of the bridge **(Figure 2)**. The master noted the ship's position from the Global Positioning System (GPS) at 0500. He wrote it in the deck logbook and plotted the ship's position on the chart; he then adjusted the ship's heading to 041º. Information from the vessel's voyage data recorder (VDR) indicated that the master then occupied himself on the bridge with other tasks.

At around 0515, *Seagate*'s lookout alerted the chief officer to a vessel on his starboard side. *Seagate*'s transmitted Automatic Identification System (AIS) data showed that she was on a heading of 114º at that time. The chief officer determined that the vessel (*Timor Stream*) was overtaking *Seagate* on a course of around 090º and would pass 3 or 4 cables clear down his vessel's starboard side. He attempted to plot *Timor Stream*'s radar target, but was unsuccessful: he did not take a visual bearing of the vessel.

At 0520, the motor yacht *Battered Bull* was heading 326º at a speed of 12.5 knots at a range of 13nm from *Seagate*, on an almost reciprocal heading **(Figure 3)**. *Timor Stream* was around 25º on *Battered Bull*'s port bow crossing from port to starboard. *Battered Bull*'s chief officer identified that *Seagate* and *Timor Stream* were 6.7nm apart and that action was required by *Seagate*, the give way vessel, to avoid a close quarters situation or collision.

By 0532, *Seagate* and *Timor Stream* were 2.8nm from each other on a collision course **(Figure 4)**; *Battered Bull* was 8.5nm from *Seagate*. *Battered Bull*'s chief officer altered course 24º to port to avoid the developing situation with both *Seagate* and *Timor Stream* **(Figure 5)**.

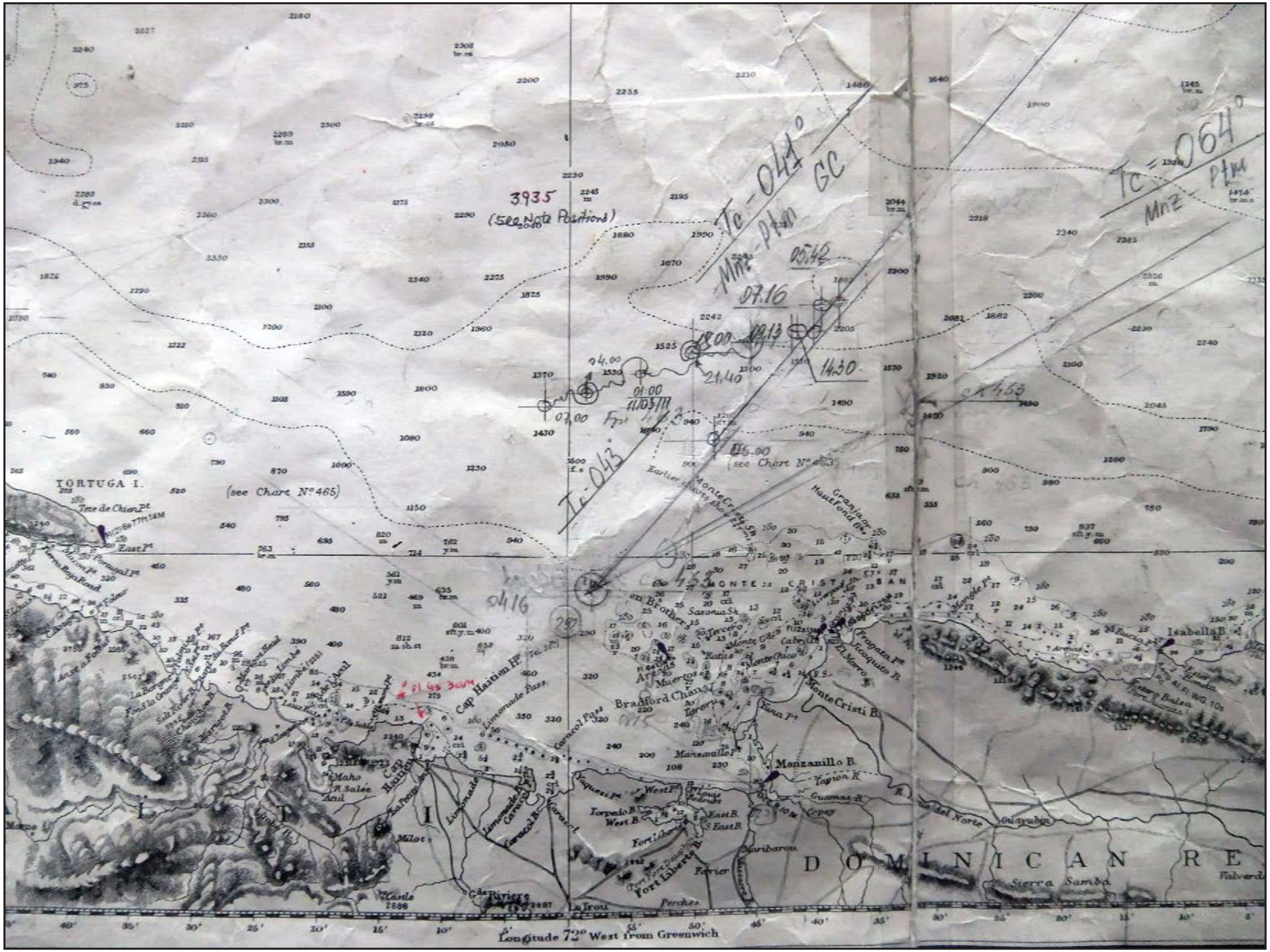

Figure 1: *Timor Stream*'s chart (extract)

Figure 2: *Timor Stream* – desk on the starboard side of the bridge

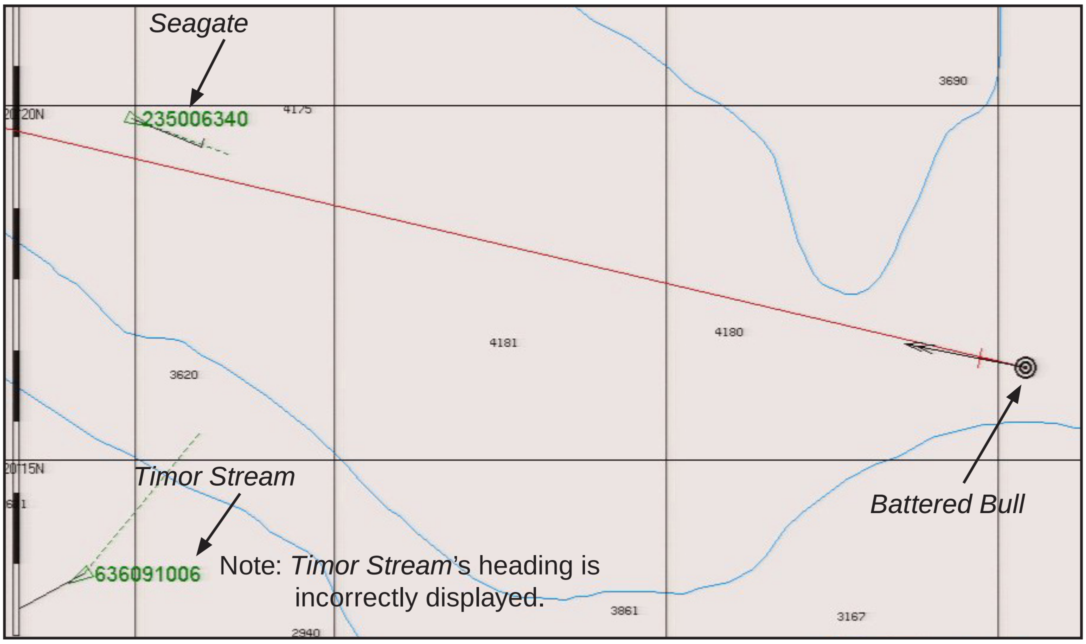

Figure 3: *Battered Bull*'s ECS display at 0520

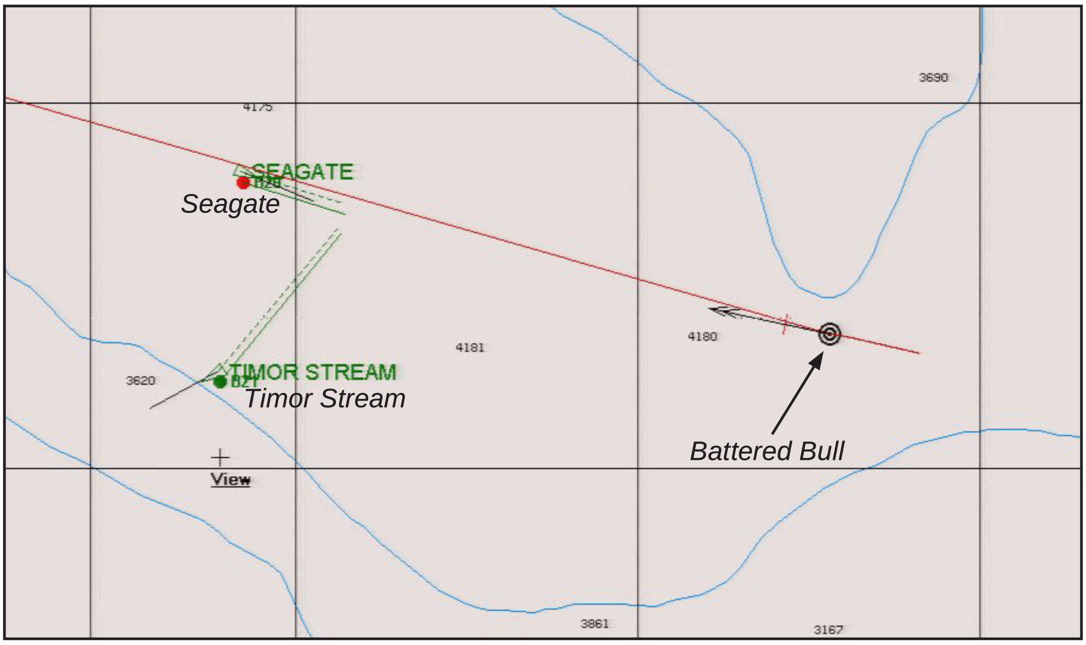

Figure 4: *Battered Bull*'s ECS display at 0532

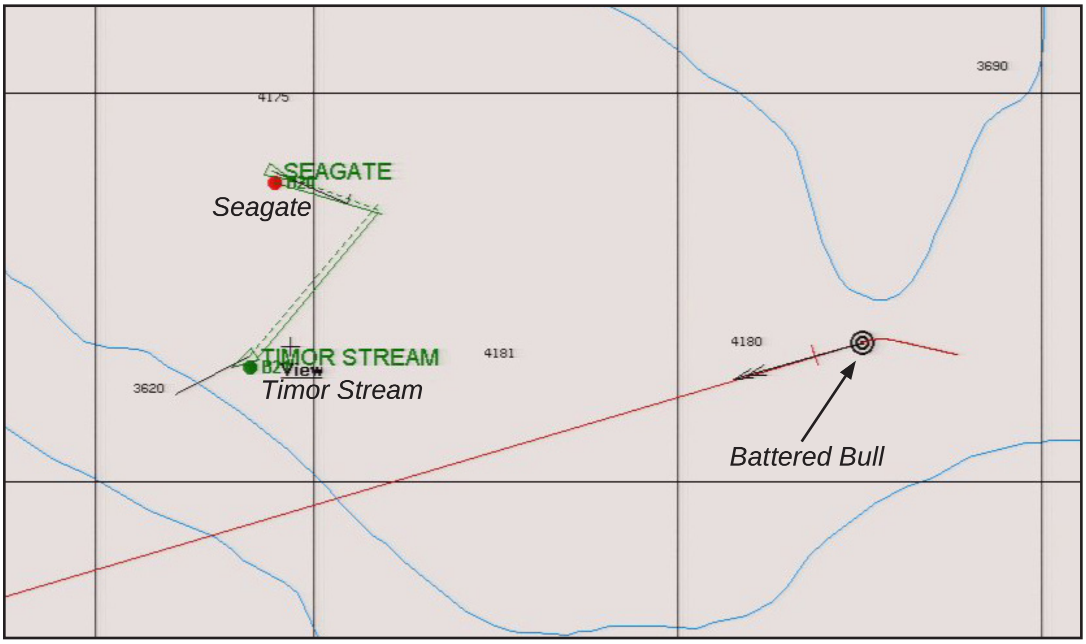

Figure 5: *Battered Bull*'s ECS display at 0533

At around 0535, *Seagate*'s lookout again told the chief officer about the other ship on his starboard side. As the distance between the two ships further reduced, the lookout yet again alerted the chief officer to the presence of the other ship. At 0539 **(Figure 6)** the chief officer started to alter *Seagate*'s heading slowly to port; he predicted that this adjustment would increase the passing distance of the two ships. Shortly afterwards the lookout shouted at the chief officer to "*do something".* The chief officer reported that he saw *Timor Stream* turn to port towards *Seagate* and, when he realised that a collision was imminent, he put the steering controls into manual mode and turned the helm hard to port.

Timor Stream's master first saw a ship very close on his port bow at 0540 **(Figure 7)**. He was unable to take avoiding action prior to the collision in the short time available to him.

1.2.2 The collision

At 0540:50 the two vessels collided **(Figure 8)**. *Timor Stream*'s heading had not changed; *Seagate*'s heading had altered by 7º. *Timor Stream*'s bow hit the after part of *Seagate*'s starboard side in the area of the accommodation block and engine room; the engine room started to flood and the electrical power system failed. *Seagate*'s starboard liferaft was destroyed and its starboard lifeboat fell onto *Timor Stream*'s damaged forecastle deck.

1.2.3 Actions following the collision

Seagate's master went to the bridge. The chief officer activated the ship's general emergency alarm, but it did not sound. As the engine room flooded, the duty engineer and the motorman evacuated it. The steering gear compartment subsequently flooded through the two fire doors that separated it from the engine room.

At 0542 *Timor Stream*'s master sounded the general alarm on his vessel. This was followed at 0544 by *Seagate*'s master issuing a "Mayday" call by Very High Frequency (VHF) radio. At 0547 *Timor Stream*'s master also issued a VHF radio "Mayday" call; *Battered Bull* altered course towards the two damaged ships at 0548.

Shortly after the collision several of *Timor Stream*'s crewmen arrived on the forecastle; they shouted to *Seagate*'s crew to come across to their vessel. At around 0600, six of *Seagate*'s crew climbed on board *Timor Stream*.

Also at around 0600, *Seagate*'s master instructed the chief officer to prepare the port side lifeboat and liferaft for launching. The chief officer took a motorman, and told him to lower the lifeboat into the water. The chief officer, who was not wearing a lifejacket, then climbed onto the top of the lifeboat **(Figure 9)**, went inside it and attempted to disengage the lifeboat's fall blocks from their release hooks. The chief officer was not familiar with the release mechanism and was unable to release the hooks.

At 0607, full astern power was used on *Timor Stream* to separate her from *Seagate*. No discussion had taken place between the masters of the two vessels before the manoeuvre. *Timor Stream*'s crew prepared a pilot ladder on each side of the ship and prepared to launch their rescue boat.

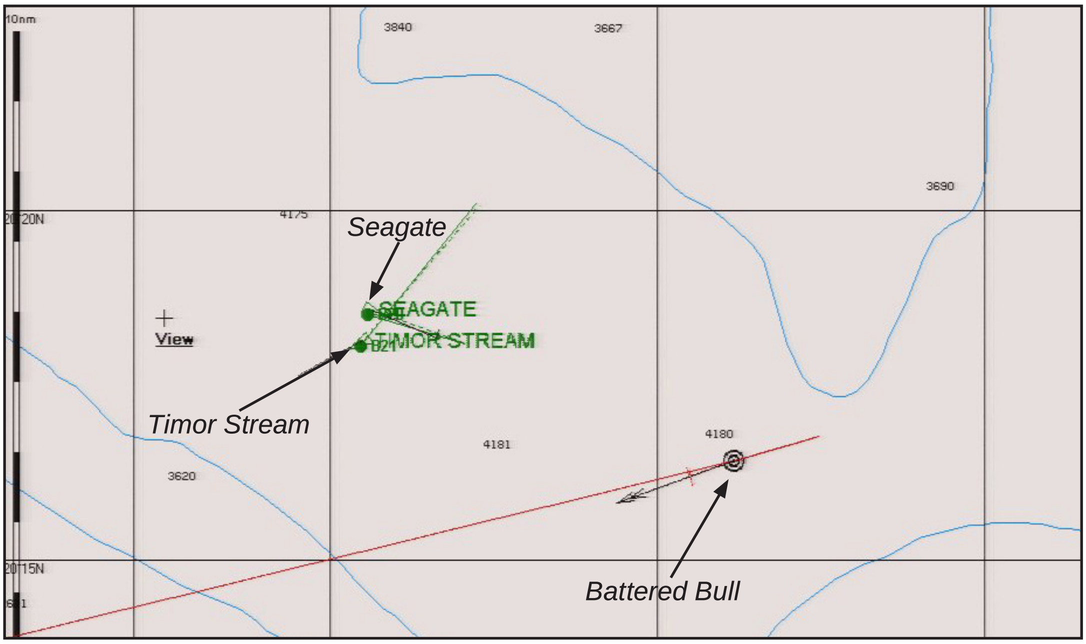

Figure 6: *Battered Bull*'s ECS display at 0539

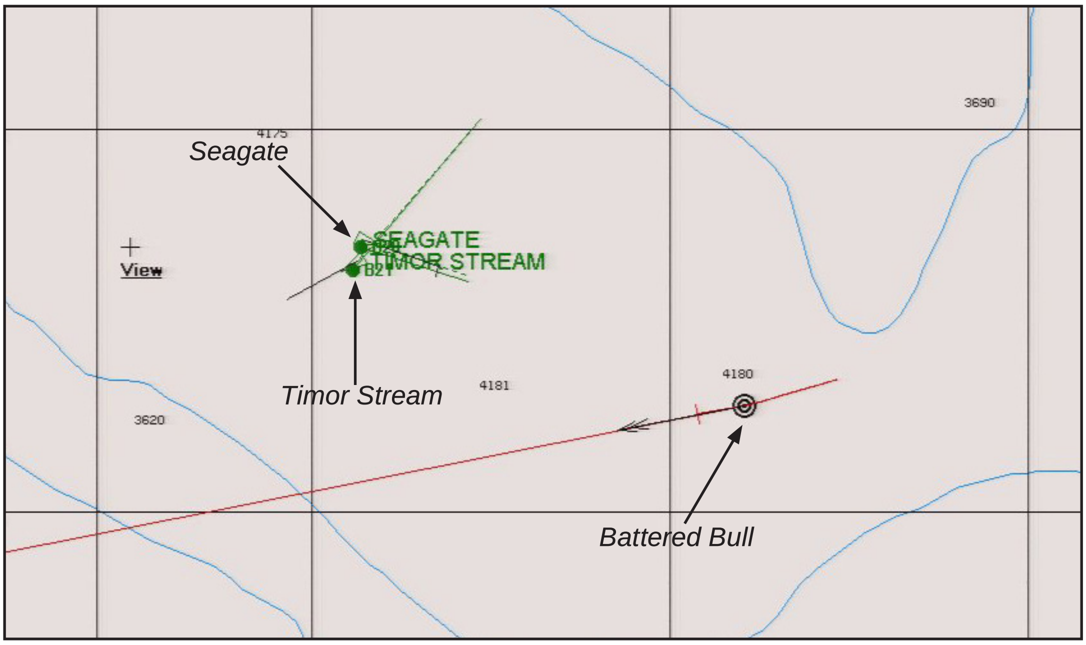

Figure 7: *Battered Bull*'s ECS display at 0540

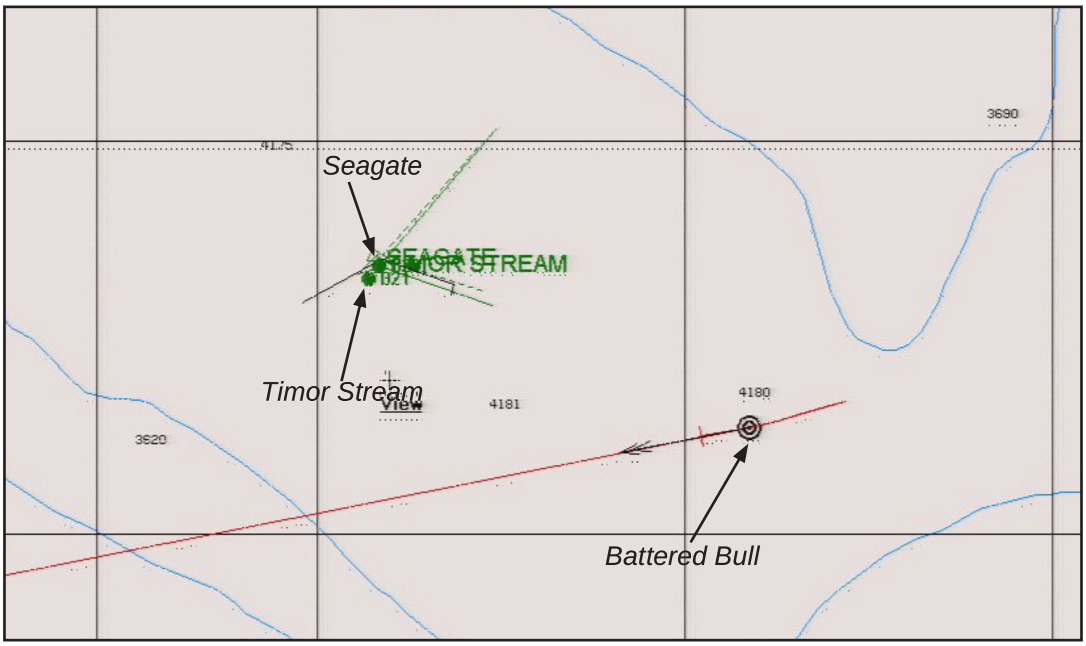

Figure 8: *Battered Bull*'s ECS display at 0540:50

Figure 9: Pre-accident photograph showing *Seagate*'s starboard lifeboat for illustration purposes

At around 0625 *Seagate*'s port liferaft was thrown overboard, and inflated. Eleven crewmen lowered themselves overboard and dropped into the liferaft. The master, chief engineer and second officer remained on board.

Timor Stream's master manoeuvred the vessel to facilitate recovery of *Seagate*'s crewmen from the liferaft. At 0630 *Seagate*'s liferaft was positioned alongside *Timor Stream* and all the crewmen climbed up the pilot ladder and on board.

At about 0630, *Seagate*'s chief officer climbed onto the bow of the port lifeboat and attempted to disengage the lifeboat's release hooks manually. Shortly afterwards, at around 0635, he fell overboard from the lifeboat, landing in the sea between the lifeboat and the ship's side. *Seagate*'s master used the VHF radio to broadcast that a man was overboard, and the chief engineer threw a lifebuoy into the sea close to the chief officer. The chief officer held onto the lifebuoy and the liferaft boarding ladder. *Battered Bull*'s master manoeuvred his yacht **(Figure 10)** close to the chief officer and a manoverboard recovery net was rigged over the yacht's side **(Figure 11)**. The chief officer swam, with the lifebuoy, to *Battered Bull* and their crewmen pulled him on board. The chief officer was covered in oil, exhausted and disorientated, but was uninjured.

At 0715 *Seagate*'s master broadcast on VHF radio channel 16 that, despite sustaining substantial damage, the vessel was not sinking or in immediate danger.

Figure 10: *Battered Bull*

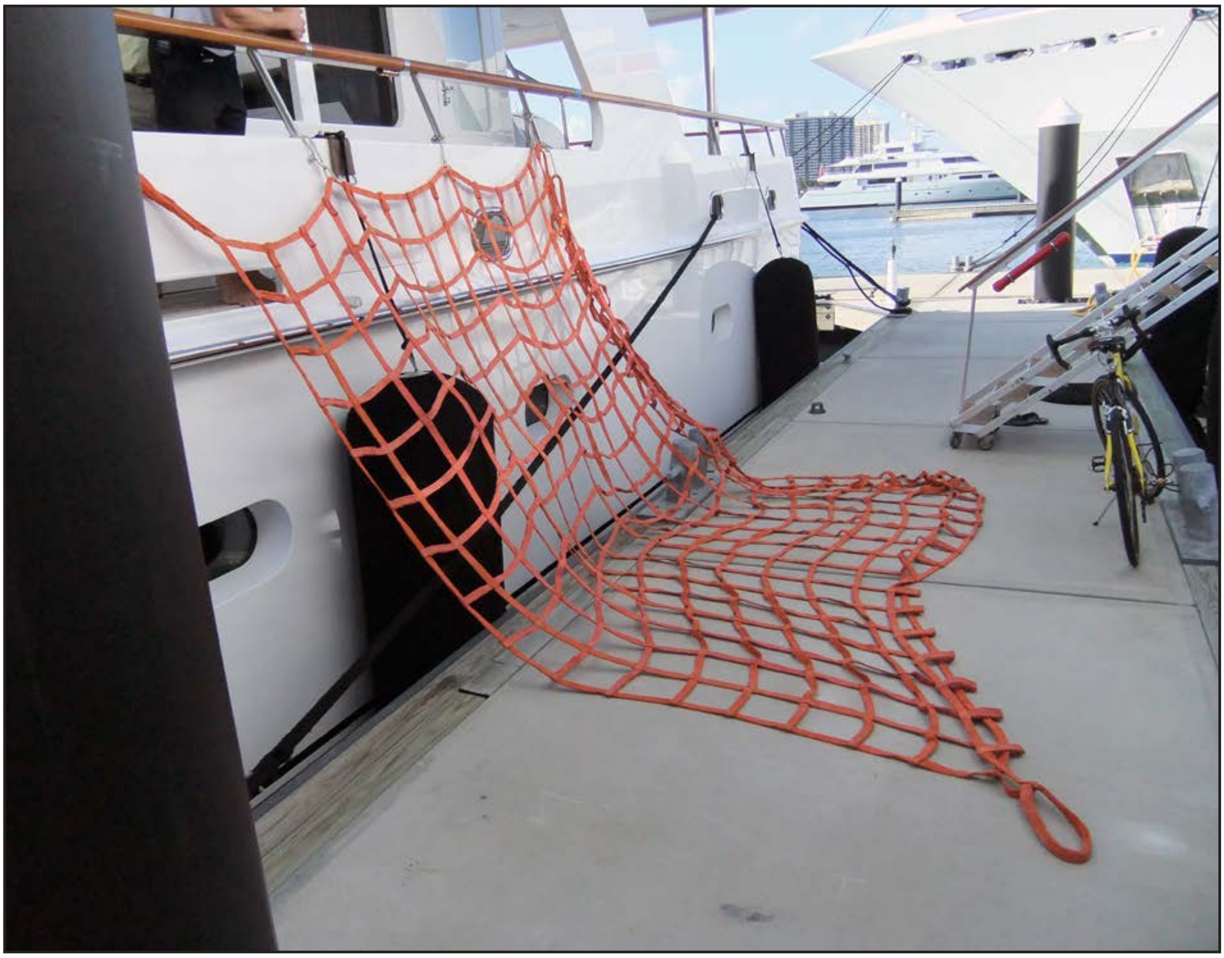

Figure 11: *Battered Bull*'s manoverboard recovery net

Battered Bull's master contacted *Seagate*'s managers in London at 0740 and *Seagate*'s chief officer told them about the situation. At 0803, *Battered Bull*'s master spoke to the United States Coast Guard (USCG) station in Miami, USA, by satellite telephone. At 0910 the coastguard advised *Battered Bull*'s master that a helicopter and fixed wing aircraft would be on site in 10 minutes' time, and that a cutter would arrive in around 2 hours' time. The USCG helicopter and fixed wing aircraft arrived on scene at 0930; the cutter, *USCG Venturous* **(Figure 12)**, arrived at 0958.

Figure 12: *USCG Venturous*

At 1015, *Seagate*'s chief officer transferred from *Battered Bull* onto *USCG Venturous*. The USCG released *Battered Bull* from the scene at 1017 and it continued on its voyage.

Seventeen crewmen from *Seagate* transferred from *Timor Stream* to *USCG Venturous* at 1100; at 1106 the USCG vessel's commanding officer released *Timor Stream* from the scene to return to port. *Timor Stream*'s master headed his vessel for Santo Domingo Bay, to the south of the Dominican Republic.

A boarding team from *USCG Venturous* embarked on *Seagate* at 1215 to assess the vessel's condition. The boarding team's leader handed the master an email that contained a number of instructions from *Seagate*'s managers; one of these was to download the data relating to the accident from the ship's VDR. The master interpreted the company's instruction to download the VDR literally. Rather than attempt to save the data or safeguard it by removing the data storage capsule, he left the VDR intact until there was electrical power to allow him to download the data. As a consequence, the VDR's data was not saved or otherwise protected. At 1340 *Seagate*'s last three crewmen, including the master, transferred to *USCG Venturous*.

1.2.4 Subsequent actions

The following day, 11 March 2012, the USCG escorted the master and several officers back on board *Seagate* to stabilise the ship's condition and consider how the vessel might be salvaged. While they were on board, the crew restored some electrical power. Unknown to the crew, this allowed the VDR to restart and the data from the accident was eventually overwritten. During the day, 16 crewmen were transferred to a Dominican Republic naval ship and landed ashore in the Dominican Republic. The master, chief engineer, second officer, bosun and a fitter remained on board *Seagate*.

A tug arrived to support and stand by *Seagate* and, once *USCG Venturous'*s commander was satisfied that the situation was stable, she left the scene. *Seagate*'s managers contracted a larger tug to tow the vessel and, a few days later, *Seagate* was towed to Port-au-Prince, Haiti, where the cargo was later discharged. The vessel was subsequently declared a total constructive loss[1] and scrapped.

Timor Stream continued to Port of Spain, Trinidad and Tobago, for temporary repairs. *Timor Stream*'s classification society then allowed the ship to undertake a single voyage to Portsmouth in the UK to discharge its cargo before undergoing permanent repairs in Europe.

1.3 DAMAGE

1.3.1 *Seagate*'s damage and pollution

Seagate suffered extensive damage to the aft starboard side **(Figures 13a** and **b)**. The engine room was holed above and below the waterline and flooded. Around 12500 litres of diesel oil and 5500 litres of lubricating oil spilled into the sea and flooded engine room from two damaged tanks. The accommodation on the starboard side was heavily damaged, including numerous cabins and the mess room. The starboard lifeboat and liferaft were destroyed. The cargo holds were undamaged and the vessel remained stable throughout the tow to Port-au-Prince.

Although crew members were asleep in some of the heavily damaged cabins **(Figure 14)**, there were no injuries either in the collision or subsequent abandonment.

1.3.2 Damage to *Timor Stream*

Timor Stream sustained major damage to its bow section **(Figure 15)**; however, the collision bulkhead was not breached. The bulbous bow was damaged and the lower forepeak tank was holed. The shell plating to the upper fore peak tank was also holed above the waterline. Both anchors were badly damaged and were unusable. The forecastle deck, mooring equipment, bulwarks and mooring line fairleads were also severely damaged. There were no injuries and there was no pollution.

[1] A constructive total loss is where the cost of repairs to a ship, plus the cost of salvage, equals or exceeds its value for insurance purposes.

Figure 13a: *Seagate's* starboard side – post-collision

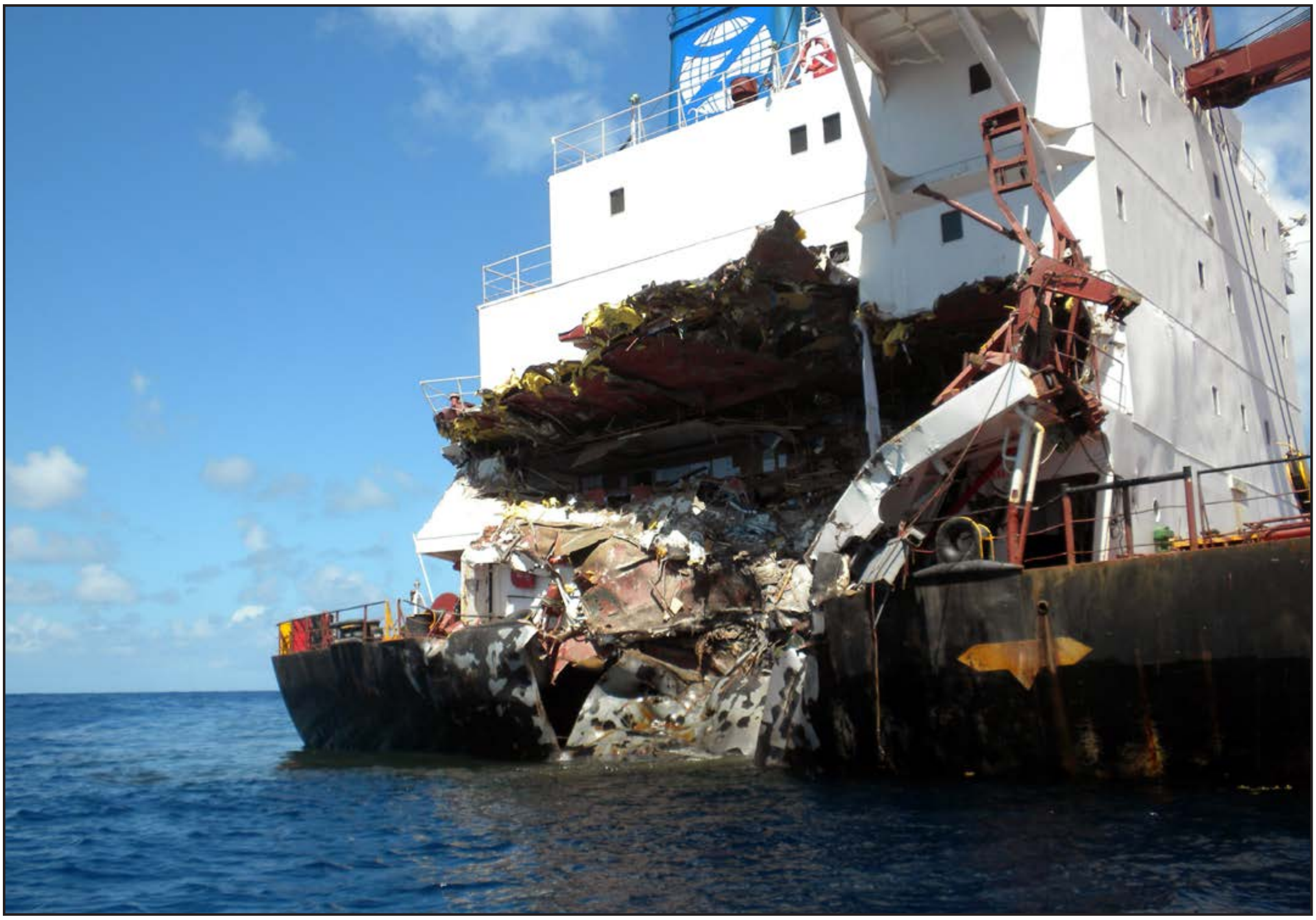
Figure 13b: *Seagate's* starboard side – post-collision (close-up)

Figure 14: Crew cabin on board *Seagate* – post-collision

Figure 15: *Timor Stream*'s bow section – post-collision

1.4 *SEAGATE*

1.4.1 Zodiac Maritime Agencies Limited

Seagate was managed by Zodiac Maritime Agencies Limited (Zodiac), a London based ship management company which operates a fleet of about 140 ships.

Training

Zodiac's crews were required to undertake additional Computer Based Training (CBT) in various subjects to meet minimum standards set by the company. Bridge watchkeepers were required to undertake specific training in navigation techniques and the application of the International Regulations for Preventing Collisions at Sea 1972 (as amended) (COLREGS).

Audit

Zodiac's managers carried out an internal International Safety Management (ISM) audit of *Seagate* in December 2011; no non-conformities were raised. As most of the voyages undertaken by the company's bulk carriers consisted of long sea passages, the opportunities for company managers to carry out internal audits at sea were limited, and therefore most audits were carried out in port. However, an in-house navigation audit was carried out in August 2008 while the ship was at sea.

Crew evaluation

Zodiac operated a system to evaluate each crew member's performance. Senior officers recorded evaluations either at the end of a crewman's contract on board the ship, or when the reporting officer completed his contract. Zodiac's London office staff maintained a database of the results.

Crew were marked from 1 to 5 (1 being the highest score) in each of the following categories: safety, proficiency, obedience, loyalty, sobriety, English language and dedication. A brief section for any other comments was provided, as well as an option to state whether the crewman was suitable for promotion. The reporting officer was not required to disclose the content of the evaluation report to the person being evaluated.

If a crewman was marked with a score of 4 or 5 in any category, the Human Resources Department informed the relevant Zodiac manager or superintendent of the results: the manager or superintendent would then decide whether any further action was required.

1.4.2 *Seagate*'s key personnel

Master

The 63 year old Croatian master held an International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) II/2 Certificate of Competence as master. He had been a master for 30 years, the last 26 of which were with Zodiac; he had been on board *Seagate* for 7 weeks.

Chief Officer

The 50 year old Ukrainian chief officer held an STCW II/2 Certificate of Competence as master. He had been a chief officer for 17 years, the last 6 years of which were with Zodiac; he joined *Seagate* 10 days before the accident.

The chief officer's previous performance evaluations ranged from the highest score to the lowest, but were generally considered to be within the company's limits of acceptability. The written comments primarily referred to his ability to manage the loading and discharge of cargo. On the occasion when he was given a score of 4 for 'proficiency' it was understood to relate to his cargo work. The company warned the chief officer that his performance had been identified as poor. He was asked to respond to this assessment and undertook to improve his performance.

Ordinary Seaman – the lookout

The 42 year old Romanian OS held an STCW II/4 Certificate of Competence as a rating forming part of a navigational watch. He had worked as an OS for the previous 8 years, and for Zodiac for the last 4 years; he had been on board *Seagate* for 9 days.

1.4.3 Watchkeeping routines

At sea the chief officer, second officer and third officer worked bridge watches of 4 hours on duty, followed by 8 hours off duty. The chief officer kept the 0400 to 0800 and 1600 to 2000 watch.

1.4.4 Instructions for watchkeepers

Zodiac had issued guidance on collision avoidance as part of its standing instructions **(Annex B)**. These stated that:

> *"The primary means to determine whether risk of collision exists is to carefully monitor the compass bearing of an approaching vessel. Visual bearings should be supported by ARPA."*

The master's standing orders for "*Keeping a good watch"* **(Annex C)** stated*:*

> *"The officer of the watch is responsible for the maintenance of a continuous and alert watch, this is one of the most important considerations in the avoidance of collisions, strandings and other casualties.*
>
> *In order to keep an efficient watch the officer of the watch should ensure the following:*
>
> *a) An alert all-round visual and aural (sound) lookout to allow a full grasp of the current situation, including the presence of ships and landmarks in the vicinity*
>
> *b) Close observation of the movements and bearing of approaching vessels*
>
> *c) Identification of ship and shore lights.*

The master's general night orders, dated 20 January 2012 **(Annex D)**, stated, inter alia:

- *A sharp lookout is to be maintained at all times. Radars are to be used as appropriate.*

- *Frequent radar plotting of all targets is to be done without fail.*

- *Early action to avoid close quarters situations will always be taken in ample time and be large enough so as to be clearly identifiable by all other vessels in the vicinity. In such cases always inform me if time permits.*

- *IF IN THE SLIGHTEST DOUBT….AT ANY TIME….DO NOT HESITATE TO CALL THE MASTER AT ONCE!*

The master's night order book for 9/10 March 2012 **(Annex E)** stated that OOWs should:

- *Keep a sharp lookout for traffic around.*

- *Attend to standing orders posted on the bridge.*

- *Keep CPA ≥3nm and TCPA[2] ≥15 minutes.*

The chief officer had signed the master's night orders to acknowledge that he had read and understood them.

1.4.5 Bridge equipment

The primary means of navigation was with British Admiralty paper Standard Nautical Charts **(Figure 16)**.

Seagate's bridge **(Figure 17)** was fitted with two X band (3cm wavelength) radars, one on each side of the bridge. Both radars were fitted with an automatic radar plotting aid (ARPA). The starboard radar was also capable of displaying AIS data overlaid onto radar targets. At the time of the accident, it was reported that there was a fault with the system and, consequently, the radar was not able to display the AIS data.

A Nauticast AIS unit was located in the chart room **(Figure 18)**. The AIS display screen was small and showed vessels' ranges, bearings, and names, in the form of text lists.

1.4.6 Radar operation

The chief officer used the starboard radar mainly for collision avoidance. The radar was set to a north-up display, usually on a 12nm range setting and offset to increase the range ahead. Targets were displayed with true vectors.

The port radar was set in north-up, true motion mode, usually on a 12nm range.

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[2] Closest Point of Approach (CPA) and Time to Closest Point of Approach (TCPA) refer to the master's instructions for the minimum acceptable limits of either distance or time for collision avoidance.

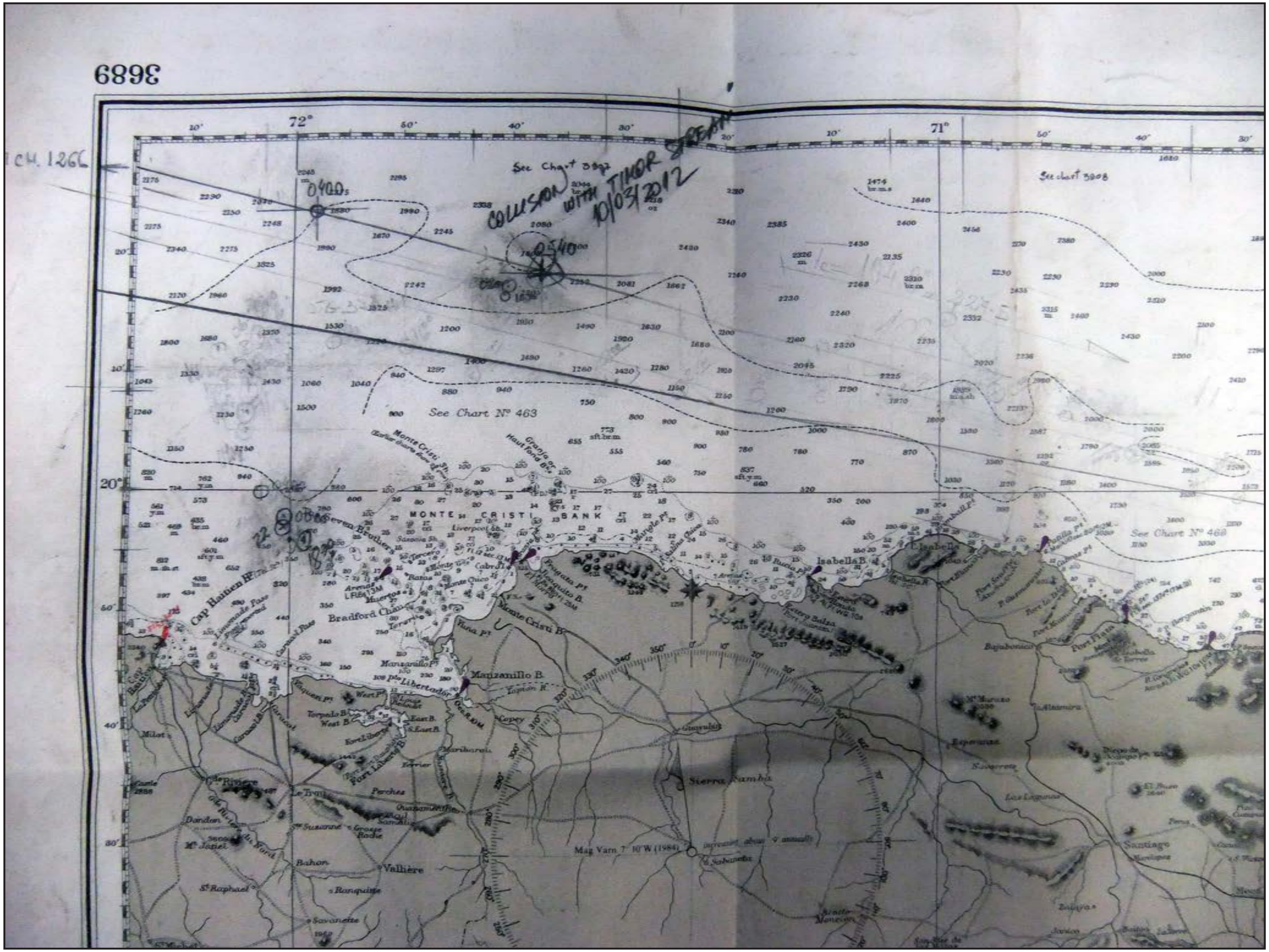

Figure 16: *Seagate*'s chart (extract)

Figure 17: *Seagate*'s bridge

Figure 18: *Seagate*'s AIS unit

1.4.7 Lifeboats and liferafts

Seagate was fitted with a totally enclosed lifeboat and a liferaft on each side of the accommodation block at the aft end of the ship; a smaller liferaft was positioned close to the bow.

1.5 *TIMOR STREAM*

1.5.1 Background

Timor Stream was one of four ships that were time-chartered to Geest Line Limited by Seatrade Reefer Chartering Naamloze Vennootschap (N.V.). The ships were managed by Triton Shiffahrts Gesellschaft mit beschrankter Haftung (GmbH).

The four ships operated a liner service between Portsmouth and Le Havre in Europe and several ports in the Caribbean islands. Each ship would take about 7 days at sea on passage to the Caribbean and then call at around 8 ports in a week before the return passage to Europe.

1.5.2 *Timor Stream*'s key personnel

Master

The 49 year old Russian master held an STCW II/2 Certificate of Competency as master. He had worked for Triton Schiffarts GmbH for 6 years as master.

The hours of work and rest records **(Annex F)** showed that the master had rested for 13.5 hours the previous day. The records stated that he had rested the night before departure and had started to work at 0230 on the morning of the accident. He had worked for just over 3 hours by the time of the accident.

1.5.3 Bridge layout and operation

The primary means of navigation was with British Admiralty paper Standard Nautical Charts. Two X band (3cm wavelength) ARPA radars were located on the port side of the bridge **(Figure 19)**. The AIS unit **(Figure 19)** was located by the centre bridge front window. A pilot chair was provided on the centre line and, although the view ahead was partially obstructed by the deck cranes **(Figures 20)**, it was still possible to obtain a good view ahead by changing position on the bridge. A watch alarm was provided, but was not in use at the time of the accident.

The Global Maritime Distress and Safety System (GMDSS) station was located at the aft part of the bridge on the centre line, separated from the bridge front by a curtain. A computer, which was used for the ship's routine emails, was located at a desk on the starboard side of the bridge **(Figure 21)**.

1.5.4 Watchkeeping routines

During the busy period of the port calls in the Caribbean islands, the master and the second officer kept bridge watches of 6 hours on and 6 hours off between them. The chief officer worked in port and rested between port calls. Once on ocean passage, the master kept the 0800 to 1200 and the 2000 to 2400 watch, the chief officer kept the 0400 to 0800 and 1600 to 2000 watch and the second officer kept the 0000 to 0400 and 1200 to 1600 watch. An able seaman officer trainee (ABOT) carried out a combination of watchkeeping and day work as a part of his training programme.

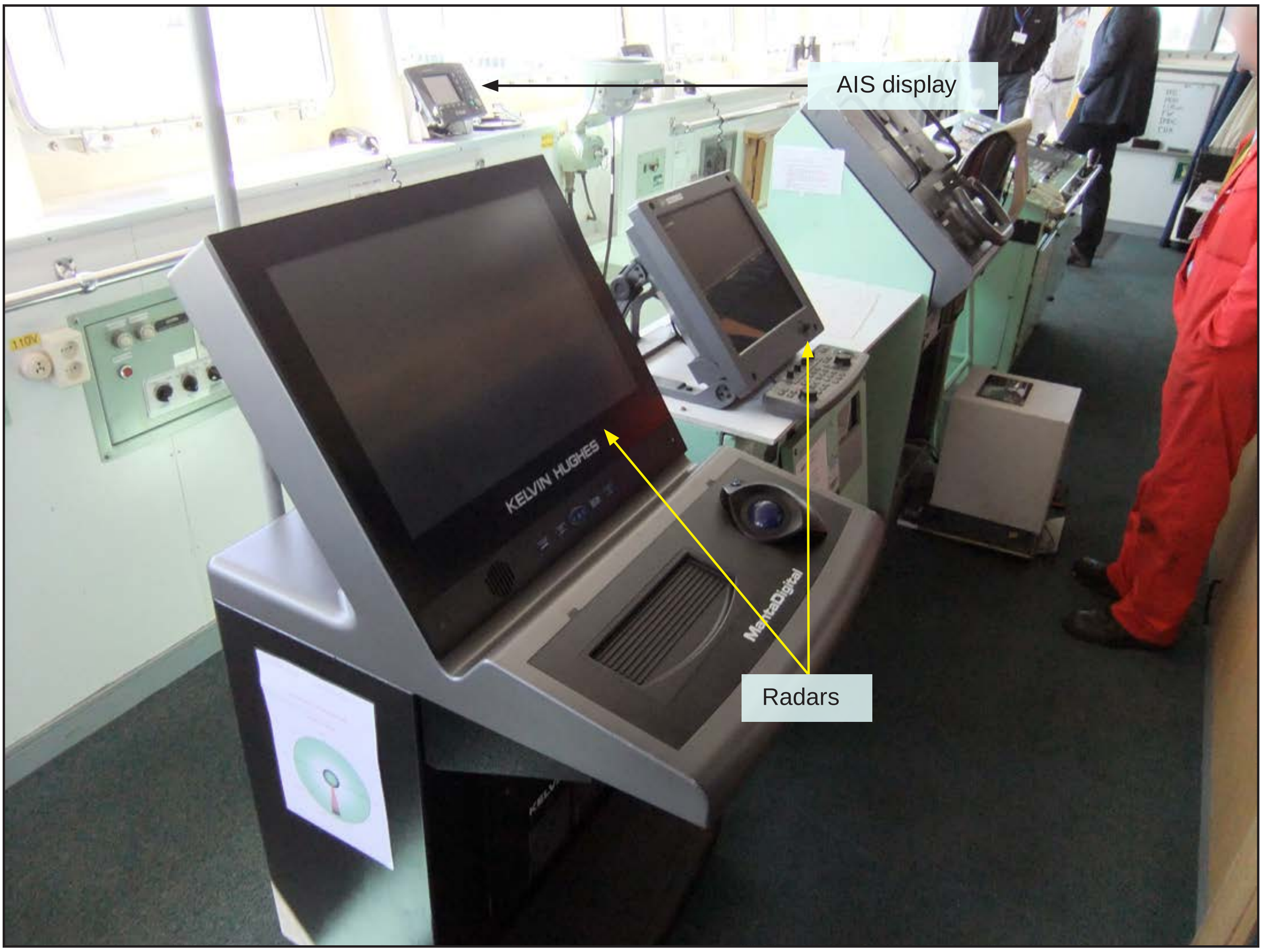

Figure 19: *Timor Stream*'s bridge – radars and AIS display

1.5.5 Instructions for watchkeepers

The master's Standing Orders **(Annex G)** for bridge watchkeeping included instructions that OOWs should, continuously, maintain a good lookout and check the radar (including its adjustment).

1.5.6 AIS heading and gyro compass repeater alignment

At the time of the accident, the AIS data transmitted from *Timor Stream* showed that the vessel's heading was around 160º different to its actual heading. This data was recorded on *Timor Stream*'s VDR and on *Battered Bull*'s electronic chart system. *Timor Stream*'s AIS data was received from the gyro compass via the gyro interface repeater **(Figure 22)**. Following the accident it was established that the error introduced into the AIS was variable.

Figure 20: *Timor Stream*'s pilot chair and forward view

Figure 21: *Timor Stream*'s bridge computer used for emails

Figure 22: *Timor Stream*'s gyro interface repeater

1.5.7 Voyage data recorder

Timor Stream's VDR data was saved by the master after the accident. The technician employed to remove the data from the VDR was unable to recover the data due to several faults with the software that was loaded onto the equipment. Data from *Timor Stream*'s systems, and *Seagate*'s AIS data were later downloaded by the MAIB's VDR specialists who were able to identify and provide the correct versions of the software. It was established that *Timor Stream*'s radar information had not been saved due to a fault with the system.

1.6 ENVIRONMENTAL INFORMATION

The weather and sea conditions at the time of the accident were reported as:

- Cloudy, with occasional light isolated rain showers
- Wind: north-east, Beaufort Force 3
- Swell: north-east, height 1.5m **(Figure 23)**

The accident occurred at night. Civil twilight that morning was at 0637, with sunrise at 0659. The moon, when visible, was gibbous and waning (2 days after full moon) with moonset at 0821.

Figure 23: Environmental conditions shortly after the collision

1.7 REGULATIONS FOR COLLISION PREVENTION

The COLREGS relevant to this accident are quoted in full at **Annex H**. The effects of these COLREGS are summarised as follows:

- Rule 2 – Responsibility. This rule permits a departure from the collision prevention rules if required to avoid immediate danger.
- Rule 5 – Lookout. This rule states that, as well as visual lookout, radar and any other means can, and should, be used when required to assess the risk of collision.
- Rule 7 – Risk of Collision. This rule requires that all means possible, including radar, should be used to assess if a risk of collision exists as early as possible. Risk of collision is primarily determined by monitoring the compass bearing of an approaching vessel.
- Rule 8 – Action to Avoid Collision. This rule requires that action to avoid collision is positive, clear, and made in ample time.
- Rule 13 – Overtaking. This rule states that the overtaking vessel must keep out of the way of the vessel being overtaken. A vessel is defined as overtaking when it is approaching another vessel from a direction more than 22.5º (2 points) abaft its beam. Only the stern light of a vessel being overtaken would be visible from an overtaking vessel.
- Rule 15 – Crossing situation. When two power-driven vessels are crossing each other and there is a risk of collision, the vessel which has the other on its own starboard side shall keep out of the way of the other and, if possible, avoid crossing ahead of the other vessel.
- Rule 16 – Action by the give-way vessel. Every vessel required to give way must take early and substantial action to keep well clear.
- Rule 17 – Action by the stand-on vessel. Where one of two vessels is to keep out of the way the other vessel should maintain its course and speed. The stand-on vessel may take action to avoid collision as soon as it is apparent that the give way vessel is not taking the required actions. If the two vessels are so close, that both vessels would need to take action to avoid collision, then the stand on vessel shall take the best action available to avoid the collision. However, a stand on vessel should try to avoid altering course to port for a vessel on its own port side.

1.8 ISM CODE REQUIREMENTS

The ISM Code[3] states inter alia:

- Section 6, Resources and personnel
  - *"The Company should establish procedures to ensure that new personnel and personnel transferred to new assignments related to safety and*

[3] The IMO International Safety Management Code – Resolution A.741 (18) as amended by MSC.104(730), MSC.179(79), MSC.195(80) and MSC.273(85)

protection of the environment are given proper familiarization with their duties. Instructions which are essential to be provided prior to sailing should be identified, documented and given."

- Section 8, Emergency preparedness
    - "The Company should identify potential emergency shipboard situations, and establish procedures to respond to them."
    - "The Company should establish programmes for drills and exercises to prepare for emergency actions."

1.9 *BATTERED BULL*'S ACTIONS TO AVOID COLLISION

The privately owned motor yacht *Battered Bull* was on passage from Gustavia, Saint Barthélemy (St. Barts) to West Palm Beach, Florida, USA. At the time of the accident, the bridge was manned by a chief officer and a lookout. The chief officer held a yachtmaster qualification which was suitable for ocean passages on privately owned leisure vessels of up to 200 gross tons (GT). The chief officer and the lookout both saw *Seagate* and *Timor Stream* on their radar and by eye. The two ships were tracked by the radar's ARPA and displayed, along with their AIS tracks on the yacht's Electronic Chart System (ECS) **(Figure 24)**. The ECS stored the displayed data in its system's memory.

Battered Bull's chief officer realised, at a range of at least 10nm, that a close quarters situation was developing between his vessel and *Seagate*; he also realised that an alteration of course to starboard would result in a subsequent close quarters situation with *Timor Stream*. The chief officer made an early and bold alteration of course to port to avoid any risk of collision with the other two ships.

1.10 PREVIOUS/SIMILAR ACCIDENTS

Three major collisions of SOLAS sized vessels[4] were reported to the MAIB at around the same time as this accident and were investigated by the Branch. In all three accidents, the actions of the watchkeepers were significant causal factors and in all three cases the key players were senior navigating officers who should have been fully familiar with their responsibilities as watchkeepers:

- In December 2011, the Panamanian registered container ship *ACX Hibiscus* and the UK registered container vessel *Hyundai Discovery* collided in the eastern approaches to the Singapore Strait.

- In March 2012, the UK registered passenger ferry *Stena Feronia* and the Cook Islands registered general cargo vessel *Union Moon* collided in the approaches to Belfast Harbour.

- In March 2012, the Dutch registered reefer container vessel *Spring Bok* and the Maltese registered liquefied petroleum gas (LPG) carrier *Gas Arctic* collided 6nm south of Dungeness.

[4] Greater than 500 Gross Tons (GT)

Figure 24: *Battered Bull*'s bridge and ECS display

SECTION 2 – ANALYSIS

2.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

2.2 THE COLLISION

Seagate was well established on a long sea passage; *Timor Stream* had left port 3 hours earlier at the beginning of the voyage to the UK. *Seagate*'s chief officer saw *Timor Stream,* but assumed that he was being overtaken and that *Timor Stream* would pass clear of *Seagate*. *Timor Stream*'s master, on watch alone, was not keeping an effective lookout. Neither watchkeeper was aware that the two ships were on a collision course.

Seagate's chief officer realised that a collision was imminent around 1 minute before it occurred. He turned his vessel's helm full to port for a few seconds; however, this was too late to have any significant effect. *Timor Stream*'s master was not aware of *Seagate*'s position until moments before the collision and had no time to take avoiding action.

2.3 *SEAGATE* – ACTIONS LEADING TO THE COLLISION

2.3.1 Effective lookout

Seagate's OS lookout repeatedly alerted the chief officer to the presence of a vessel approaching from the starboard side. Having decided that the reported vessel was overtaking, the chief officer dismissed the lookout's reports without making adequate checks himself. Had he done so, he would have established that *Timor Stream* was on a steady bearing, and that his was the give-way vessel. His actions were contrary to the COLREGS' Rule 5 (lookout) which requires watchkeepers to assess the situation, and the risk of collision.

The chief officer's inaction showed a total disregard for the safety of his vessel and his shipmates. Despite his experience as an OOW and gaining the required level of knowledge of the COLREGS, he made an unfounded assumption that *Timor Stream* would pass clear of his vessel.

2.3.2 Assessment of the situation

Seagate's chief officer believed that *Timor Steam* was on a heading of around 090º, at a speed capable of overtaking *Seagate* so that it would pass his vessel with a CPA of 3 or 4 cables. *Battered Bull*'s ECS data showed that, for the 40 minutes before the collision, *Timor Stream* was on a constant heading of 041º at a speed of 19.5 knots. *Timor Stream* was on a steady compass bearing of 187º from *Seagate*, 17º forward of *Seagate*'s starboard beam **(Figure 25)**.

Timor Stream displayed the appropriate navigation lights for a ship of its size when underway. Its two masthead lights and port-side light could have, in theory, shown *Seagate*'s chief officer that *Timor Stream*'s heading was between 007º and 119.5º **(Figure 26)**. Had the chief officer established *Timor Stream*'s actual heading using

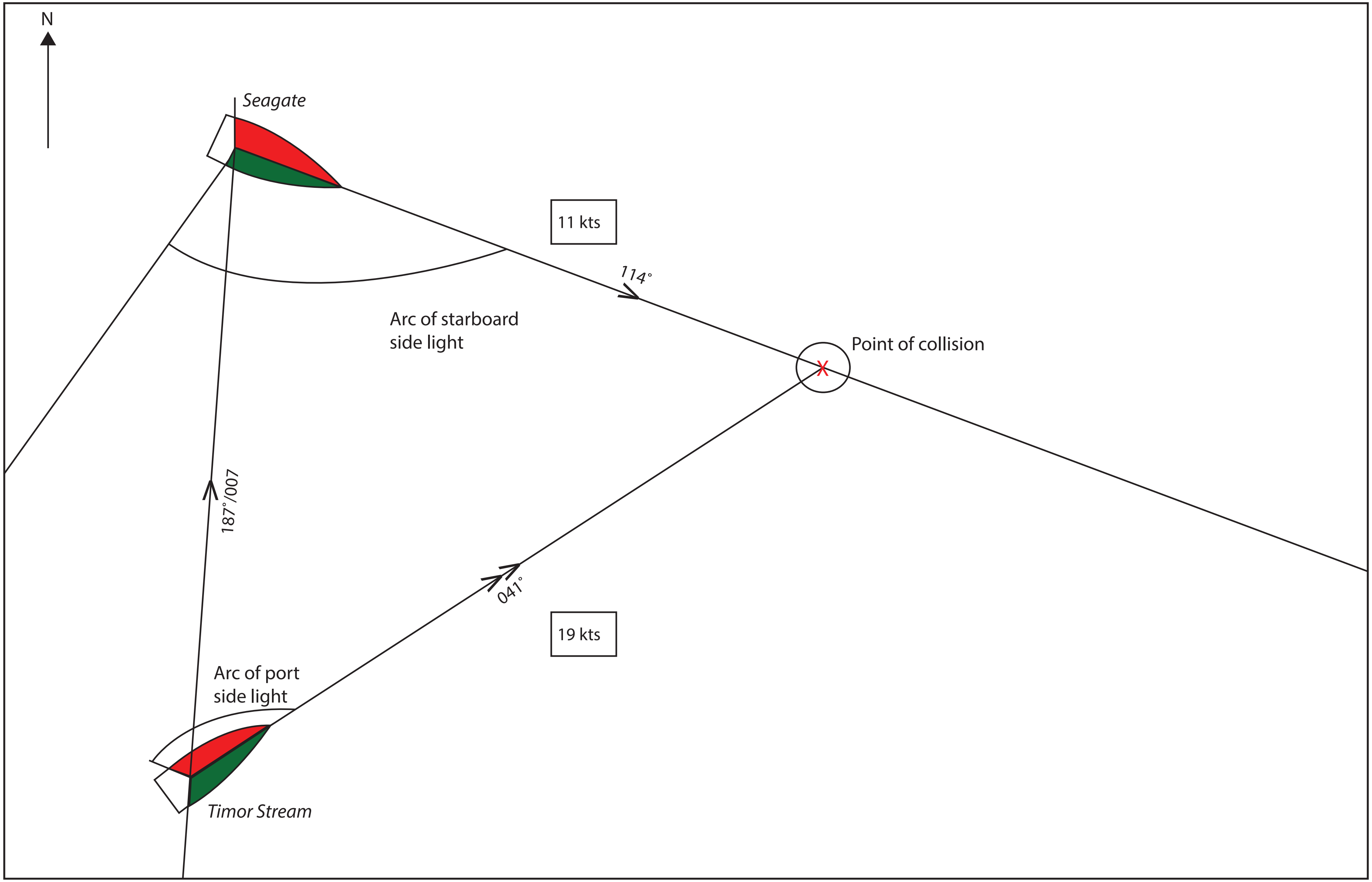

Figure 25: Collision analysis

his radar's ARPA, he should have identified that his estimate of *Timor Stream*'s heading differed by about 50º from its actual heading; he should also have realised that *Seagate* was in a crossing situation rather than an overtaking one.

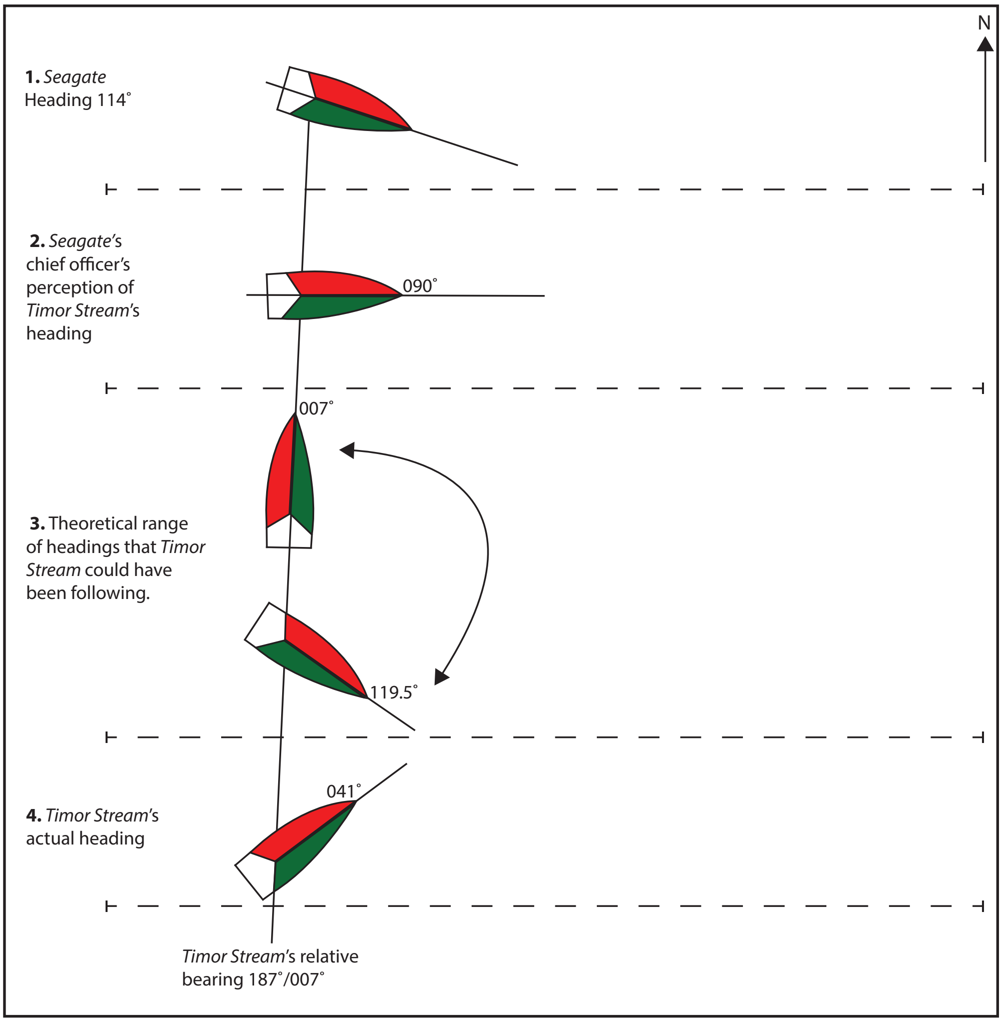

Figure 26: Analysis of the potential range of headings being followed by *Timor Stream* based on viewing its navigation lights alone

When *Seagate*'s lookout first reported the presence of *Timor Stream* to the chief officer, it was forward of the starboard beam. *Timor Stream* remained forward of *Seagate*'s beam throughout, on a steady bearing of 187º and with a steady aspect, until the two ships collided. The chief officer did not receive any indication that the relative bearing of the other vessel was changing to support his assumption that *Timor Stream* was overtaking. Had he given any thought to what was being reported to him, it should have prompted him to consider that further assessment was required.

If the chief officer had himself taken steps to verify the lookout's reports, for example by taking a series of compass bearings of the ship or plotting it using his radar's ARPA, he would have identified that *Timor Stream* was on a steady bearing. He would then have had ample time to establish that his was the give-way vessel, and been able to take appropriate action to avoid the collision.

The chief officer did not assess the situation correctly initially, or reconsider his assessment when the situation did not develop as he expected. Even in the scenario that he had imagined, he was willing to accept a CPA that was much less than specified in the master's night orders. Unfortunately, he was not able to explain why his actions had fallen so far short of what was normally expected of him.

2.3.3 The chief officer's perception of *Timor Stream*'s aspect

The chief officer estimated from the aspect of *Timor Stream*'s navigation lights, that the vessel was on a heading of around 090º. The vessel's actual heading was 041º, a discrepancy of almost 50º **(Figure 26)**. A few seconds before the collision, the chief officer believed that *Timor Stream* turned to port, although the vessel's heading did not change at all. It is considered likely that the 'turn' reported by the chief officer was actually him correcting his false perception of *Timor Stream*'s aspect.

This accident emphasises the importance of maintaining a methodical approach to watchkeeping and collision avoidance. It is extremely difficult to determine a vessel's aspect at night and, even if correct, aspect is no guarantee of a vessel's actual heading or course.

2.3.4 Human factors

Seagate's chief officer was qualified to be the master of deep sea ships of unlimited size and had been a bridge watchkeeper for many years. However, on the morning of the accident he felt able to ignore the basic watchkeeping requirements of keeping an effective lookout and establishing whether a risk of collision existed with an approaching ship. Specifically, he had a misplaced confidence in his ability to determine by eye alone whether a risk of collision existed, and felt able to ignore the risks of making a misjudgment based on scanty information.

The chief officer's attitude could have been influenced by several factors. Travelling at 11 knots, *Seagate* was a relatively slow ship and the chief officer could have expected that faster ships would routinely overtake his vessel. He might also have been lulled into a false sense of security by the conditions: it was a warm, occasionally moonlit night, with light to moderate winds, good visibility and little other traffic in an open sea. In these circumstances, it is possible that an otherwise experienced watchkeeper might allow himself to underestimate the risks of a collision.

The chief officer's complacent attitude to the required watchkeeping standards, his misplaced belief in his ability to assess the risk of collision by using visual observation, and his underestimation of the chance of encountering another vessel at close quarters combined to prevent him from taking the necessary actions to prevent the collision.

2.3.5 Fatigue

There was no evidence that *Seagate*'s chief officer was fatigued at the time of the accident, and fatigue was not considered to have had any effect on his actions.

2.3.6 The chief officer – watchkeeping summary

Seagate's chief officer was provided with overwhelming evidence that should have alerted an experienced watchkeeper that the situation he thought existed was incorrect. However, the chief officer never questioned his initial cursory assessment and remained convinced that he had correctly evaluated the situation, until it was too late to avoid the collision.

2.4 *TIMOR STREAM* – ACTIONS LEADING TO THE COLLISION

2.4.1 The master's decision to take the watch alone

Timor Stream's master decided that it was better to let the nominated night watchkeepers go to bed and for him to take the watch himself. In isolation, this decision was understandable as it would help the transition from the busy port schedule into the watchkeeping routine for the ocean passage. However, the master did not post a lookout or set the watch alarm, and instead relied on his ability to maintain an effective lookout on his own.

2.4.2 Conduct of the navigational watch

The experienced master was fully aware of the requirements of the COLREGS, the flag administration, and his company with respect to maintaining a proper lookout, particularly at night.

At 0441, an hour before the collision, *Timor Stream*'s master sent a departure email message from the computer located on the desk on the starboard side of the bridge. This would probably have taken him several minutes to complete. At that time, in the prevailing conditions, *Seagate* would probably have been detectable on *Timor Stream*'s radar. At 0500, when the master plotted the ship's position on the chart, *Seagate* was 34º on *Timor Stream*'s port bow at a range of 12nm. However, the master did not detect *Seagate* either visually or on his radar display. Similarly, he either did not notice, or took no action to correct, the incorrect heading information that was being transmitted from his vessel's AIS.

The master could easily have moved to see past any obstructions, such as the deck cranes, and to check both radars and the AIS display. He could even have maintained a partially effective lookout from the seat on the centreline. However, his report that he saw nothing of *Seagate* until moments before the collision strongly suggests that he was not looking out of the bridge windows, or at the radar or AIS displays. Given the visibility and radar conditions, it is likely that he had not been keeping an effective lookout for at least 40 minutes, and potentially longer.

VDR information indicated that the master was occupying himself on the bridge. It must therefore be concluded that he allowed himself to be distracted by tasks other than keeping a lookout, possibly by placing himself in a position where he could not see out of the bridge windows or look at his navigation aids. In choosing to take the watch alone and not setting the watch alarm, the master demonstrated extremely poor judgment, systematically overcoming each of the safeguards that should have been in place for keeping an effective navigational watch.

2.4.3 Human factors

It was evident from his lack of proper action that *Timor Stream*'s master assumed that he did not need to keep a vigilant navigational watch. It was the beginning of a long ocean passage and, like the chief officer on *Seagate*, he might also have drawn a false sense of security from the good weather conditions and lack of traffic. However, he allowed himself to become distracted while sending the departure email, and then positioned himself where he could not see what was going on around him.

The master set the standards of watchkeeping on board, yet he did not keep a proper lookout or post an additional lookout to help him. In this respect, he did not meet the minimum standards that he would have expected of his officers. His lack of regard for his primary roles as lookout and officer in charge of a navigational watch can only be assessed as complacent; he allowed himself to dismiss the potential risks of not keeping an effective watch.

2.4.4 Fatigue

Despite the timing of the accident, *Timor Stream*'s master was considered to have had adequate opportunity to rest. There was no evidence to suggest that he was adversely affected by fatigue at the time of the accident.

2.5 *BATTERED BULL*'S ACTIONS TO AVOID COLLISION

Battered Bull's chief officer, working with his lookout, established that a close quarter's situation was developing between *Seagate* and *Timor Stream*. The chief officer took early and substantial action, by making a broad alteration of course to port, to avoid any risk of *Battered Bull* colliding with either vessel. The actions were positive, made in ample time, and were fully in accordance with the COLREGS.

Battered Bull's chief officer showed a thorough understanding of the situation that he faced, and took the appropriate actions that should be expected of a diligent watchkeeper leading an effective bridge team.

2.6 STANDARDS OF BRIDGE WATCHKEEPING

The performance of the bridge watchkeepers on both *Seagate* and *Timor Stream* fell well short of expected standards. Both were well qualified and experienced, yet neither considered that their watchkeeping duties required their full attention.

It is evident, from other accidents that have been reported to the MAIB, that this situation is not isolated. These accidents all involved senior officers, each with many years experience. These accidents should serve as powerful reminders to all officers in charge of a navigational watch, and their employers, of the importance of maintaining high standards of watchkeeping at all times.

2.7 POST-ACCIDENT ACTIONS

2.7.1 Post-collision response

After the collision, the masters of both *Seagate* and *Timor Stream* took steps to account for their crew, and broadcast emergency messages. The crew of *Timor Stream* also assisted crewmen from *Seagate* onto the bow of their vessel.

There was, however, no apparent conversation or planning between the two masters before *Timor Stream* was manoeuvred away from *Seagate*. The manoeuvre was conducted relatively quickly, certainly before the effect of the damage on *Seagate* was known. *Timor Stream* might well have been supporting *Seagate* and preventing it from sinking further. The weather and sea conditions were benign and there was no immediate pressure to separate the vessels. The hasty decision to do so placed *Seagate* in unnecessary danger.

Masters and bridge watchkeepers must think carefully before attempting to manoeuvre their vessels after a major accident. The extent and effect of any damage must be considered carefully to make sure that any manoeuvres do not make the situation more hazardous.

2.7.2 *Battered Bull*'s actions

After the collision, the crew of *Battered Bull* acknowledged *Seagate*'s distress call and headed towards the two damaged ships. The master responded to the manoverboard broadcast and quickly recovered *Seagate*'s chief officer from the water. The master then communicated with the USCG, and allowed the chief officer to communicate with *Seagate*'s managers ashore.

The skilful and highly responsible actions of *Battered Bull*'s master, chief officer and crew in their reactions to the collision were very commendable.

2.8 ACTIONS TAKEN BY *SEAGATE'S* CHIEF OFFICER AFTER THE COLLISION

2.8.1 The chief officer's attempt to lower the lifeboat

Seagate's chief officer oversaw the lowering of the unoccupied sole remaining lifeboat to the water, despite only being tasked to prepare it for lowering. With no power available to recover the boat to its launch position, he then decided to board the lifeboat to release it from the falls by operating the release mechanism inside the boat. The chief officer's actions made it extremely difficult for any other crew members to board the lifeboat, or for it to be released from the falls, thereby denying the crew the use of the most capable piece of lifesaving apparatus, and the lifeboat was not used thereafter. With some of the crew embarking in the port liferaft, the only means of escape for the remaining crew was the small liferaft located close to *Seagate*'s bow.

The chief officer had not been inside the lifeboat since joining the ship 10 days before, and he was unable to operate the release mechanism because he did not know how it worked. He did not stop to ask for help from any of the other crew who had been on board for longer and had a better knowledge of the equipment.

2.8.2 Chief officer's fall overboard

The chief officer faced significant risk by boarding the lifeboat without first donning a lifejacket. This risk was realised when, as he tried to release the falls from the lifeboat's forward deck area, he fell into the sea. Fortunately, he was seen falling into the water, and he was able to hold onto a life-ring and the lifeboat embarkation ladder. It was also fortunate that *Seagate*'s master was able to alert *Battered Bull*'s master so that the chief officer could be rescued quickly.

Had the chief officer's fall gone unnoticed, or had he been injured as he fell between the lifeboat and the ship, he could have easily drowned. By not wearing a lifejacket while attempting such a risky task the chief officer placed himself in unnecessary danger and required others to come to his rescue. His actions added yet more problems to an increasingly difficult situation.

2.8.3 Summary of the chief officer's actions

In the immediate aftermath of the accident, it is quite possible that the chief officer was traumatised from his part in the collision and was not thinking clearly. Nonetheless, his actions then made a difficult situation even worse.

Had the chief officer fully familiarised himself with the operation of the lifeboat during his time on board, or asked for help, he would have been better prepared to lower it during the emergency. Instead, his actions introduced additional hazards to the situation. Further, by boarding the lifeboat alone, and failing to wear a lifejacket, he obliged others to come to his rescue.

Drills and training are specifically designed to assist personnel react effectively during the traumas of an emergency situation. The chief officer had only been on board for 10 days prior to the accident. However, his rank placed him in a position where he would be expected to take a leading role in responding to any emergency on board and, as required by the ISM Code, he should therefore have been familiar with the operation of all the lifesaving appliances and the emergency procedures on board.

2.9 ASSESSMENT OF PERSONNEL AND WORKING PRACTICES

2.9.1 Effective assessment

Neither the master on *Timor Stream* nor the chief officer on *Seagate* was working as their company managers would have wished. Managers need to have trust in their crew, but at the same time must make efforts to ensure that their trust is being earned and not misplaced. The nature of both these vessels' trading patterns made it difficult for managers to conduct sea-going audits or personnel assessments. No assessment scheme is infallible, but this and the other similar accidents show that there is a need for company managers to implement systems which seek to identify and correct poor professional standards.

Zodiac, the managers of *Seagate*, operated a personnel evaluation system, which has since been modified to make it more effective. It is considered below in order to help other vessel managers develop their own systems.

As *Timor Stream* was not UK registered, the personnel evaluation system operated by Triton Schiffahrts GmbH has not been reviewed. However, given the performance of *Timor Stream*'s master during this accident, it would be appropriate for the vessel's managers to reassess the effectiveness of their personnel reporting system.

2.9.2 Zodiac's personnel evaluation system

Zodiac's managers' records of its personnel's performance were primarily recorded in numerical format from 1 (highest), to 5 (lowest). The evaluations did not necessarily consider whether a bridge watchkeeper was proficient in their watchkeeping duties. Personnel were asked to account for their poor performance only when required to do so by a company manager; they were not routinely provided with feedback about their performance from their reporting officer.

The chief officer's written evaluations varied from the highest to the lowest levels of performance. Zodiac's managers had warned him about his poor performance on one occasion and he had subsequently provided assurances that his performance would improve. However, the chief officer's reports were primarily related to his work with cargo operations, and during his 6 years working for Zodiac there had been no specific assessment of his competence as a bridge watchkeeper. He had joined the company as a senior officer and was expected to have adequate watchkeeping standards.

Similarly, the chief officer had been on board *Seagate* for only a relatively short time before the accident, giving the master little time in which to assess his performance and identify any shortcomings in his watchkeeping. Even if he had, there was no guarantee that he would have identified any concerns in such a short period.

A more detailed evaluation system, which included the opportunity to write a description of an individual's performance across the whole range of their duties, would have helped Zodiac's managers improve their knowledge of crew performance over the long term. There are also benefits in reporting officers routinely providing more immediate feedback to crew on their performance. Zodiac's managers have since implemented a more open and wide-ranging form of evaluation, which should be more beneficial to them and their personnel.

2.9.3 Company audits

Seagate was previously audited by Zodiac managers in December 2011, a few months before the accident. The previous audit of the ship's navigational practices was carried out in 2008 when the ship was at sea.

The company's ability to carry out internal audits of its bulk carrier fleet was limited by the ships' long sea passages and unpredictable trading patterns. By accepting the limited scope and frequency of audits, Zodiac's managers reduced their oversight of the performance of their sea staff. They came to rely increasingly on their masters to ensure that standards of navigation and collision avoidance were appropriate. While this is appropriate to a certain extent, this accident highlights the importance of managers maintaining an effective inspection and audit system of vessel operations at sea.

Following the accident Zodiac's managers have reviewed their system for internal and navigation auditing of their bulk carrier fleet to ensure that they are provided with an effective oversight of bridge watchkeeping standards.

2.10 VOYAGE DATA RECORDERS

VDR data is a significant aid to accident investigation, and the data is equally beneficial to ship managers, masters and their crew. In this instance, the total lack of VDR data from one vessel, and incomplete data from the other, significantly hampered the reconstruction of events.

Seagate's VDR data was not saved after the accident, despite the MAIB inspector's and Zodiac's manager's requests to the master. The master was aware of the request and focused on downloading the data, rather than making sure it was safe. He was subsequently evacuated from the ship before he was able to download the data. When limited electrical power was later restored the VDR restarted, without the crew realising, and the data was overwritten.

The VDR data would have provided valuable factual information as to the sequence of events prior to the collision, particularly the conversations between the chief officer and the lookout. While the saving of VDR data should not interfere with actions to protect the safety of the ship and crew, it is considered likely that there was time to press the save button or remove the data capsule. Once the situation had stabilised, there were further opportunities to make sure the data was safe before the electrical power was restored. Masters and bridge officers should be familiar with the process for saving their VDR data. Emergency response drills should include the protection of VDRs' data so that it becomes established as a routine procedure.

Timor Stream's VDR had faults that prevented the data from the accident being downloaded as designed. Consequently, the local technician was unable to retrieve any data. Although the MAIB's technicians were later able to download some of the data, ship managers should ensure that the VDRs on their vessels can both record and be downloaded correctly. One way, and perhaps the best way, to have confidence that a vessel's VDR will work when it is needed is to practise recording, downloading and interrogating the data regularly.

SECTION 3 – CONCLUSIONS

3.1 SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION WHICH HAVE BEEN ADDRESSED OR HAVE NOT RESULTED IN RECOMMENDATIONS

Seagate

1. *Seagate*'s chief officer did not establish that *Timor Stream* was on a steady bearing, and that his was the give-way vessel. His actions were contrary to the COLREGS' Rule 5 (lookout) which requires watchkeepers to assess the situation, and the risk of collision. [2.3.1]

2. The chief officer's inaction showed a total disregard for the safety of his vessel and his shipmates. Despite his experience and knowledge of the COLREGS, he made an unfounded assumption that *Timor Stream* would pass clear of his vessel. [2.3.1]

3. The chief officer did not assess the situation correctly initially, or reconsider his assessment when the situation did not develop as he expected. Even in the scenario that he had imagined, he was willing to accept a CPA that was much less than specified in the master's night orders. [2.3.2]

4. It is considered likely that the 'turn' seen by the chief officer was actually him correcting his false perception of *Timor Stream*'s aspect. This accident emphasises the importance of maintaining a methodical approach to watchkeeping and collision avoidance. It is extremely difficult to determine a vessel's aspect at night and, even if correct, aspect is no guarantee of a vessel's acting heading or course. [2.3.3]

5. The chief officer's complacent attitude to the required watchkeeping standards, his misplaced belief in his ability to assess the risk of collision by eye, and his underestimation of the chance of encountering another vessel at close quarters combined to prevent him from taking the necessary actions to prevent the collision. [2.3.4]

6. The chief officer was unable to operate the lifeboat release mechanism because he did not know how it worked. [2.8.1]

7. Had the chief officer's fall overboard gone unnoticed, or had he been injured as he fell between the lifeboat and the ship, he could have easily drowned. By not wearing a lifejacket while attempting such a risky task the chief officer placed himself in unnecessary danger and required others to come to his rescue. [2.8.2]

8. The chief officer had only been on board for 10 days prior to the accident. However, his rank placed him in a position where he would be expected to take a leading role in responding to any emergency on board and, as required by the ISM code, he should therefore have been familiar with the operation of all the lifesaving appliances and emergency procedures on board. [2.8.3]

9. A more detailed evaluation system would have helped Zodiac's managers improve their knowledge of crew performance. There are also benefits in reporting officers routinely providing more immediate feedback to crew on their performance. Zodiac's managers have since implemented a more open and wide ranging form of evaluation which should be more beneficial to them and their personnel. [2.9.2]

Timor Stream

1. *Timor Stream*'s master decided that it was better to let the nominated night watchkeepers go to bed and for him to take the watch himself. However, the master did not post a lookout or set the watch alarm, and instead relied on his ability to maintain an effective lookout on his own. [2.4.1]

2. The master allowed himself to be distracted by tasks other than keeping a lookout, possibly by placing himself in a position where he could not see out of the bridge windows or look at his navigation aids. In choosing to take the watch alone and not setting the watch alarm the master demonstrated extremely poor judgment, systematically overcoming each of the safeguards that should have been in place for keeping an effective navigational watch. [2.4.2]

3. The master set the standards of watchkeeping on board, yet he did not meet the minimum standards that he would have expected of his officers. His lack of regard for his primary roles as lookout and officer in charge of a navigational watch can only be assessed as complacent. [2.4.3]

Battered Bull

1. *Battered Bull*'s chief officer showed a thorough understanding of the navigational situation that he faced, and took the appropriate professional actions expected of a diligent watchkeeper leading an effective bridge team. [2.5]

2. The skilful and highly responsible actions of *Battered Bull*'s master, chief officer and crewmen in their response to the collision are highly commendable. [2.7.2]

Other conclusions

1. This, and the other accidents recently reported to the MAIB, should serve as powerful reminders to officers in charge of a navigational watch, and their employers, the importance of maintaining high standards of watchkeeping at all times. [2.6]

2. Masters and bridge watchkeepers must think carefully before attempting to manoeuvre their vessels after a major accident. The extent and effect of any damage must be considered carefully to make sure that any manoeuvres do not make the situation more hazardous. [2.7.1]

3. The nature of both *Seagate*'s and *Timor Stream*'s trading patterns made it difficult for managers to conduct sea-going audits or personnel assessments. This accident and the other similar accidents show that there is a need for company managers to implement systems which seek to identify and correct poor professional standards. [2.9.1]

4. VDR data is a significant aid to accident investigation, and the data is equally beneficial to ship managers, masters and their crew. In the accident, the total lack of VDR data from one vessel, and incomplete data from the other significantly hampered the reconstruction of events. Ship managers should ensure that the VDRs on their vessels can both record and be downloaded correctly. One way, and perhaps the best way, to have confidence that a vessel's VDR will work when it is needed is to practise recording, downloading and interrogating the data regularly. [2.10]

SECTION 4 – ACTIONS TAKEN

Zodiac Maritime Agencies Limited has:

- Revised the computer-based training standards for its watchkeepers' knowledge and understanding of the COLREGS and navigational competence.
- Increased the audit requirements of its bulk carrier fleet and required that more audits are carried out during sea passages.
- Created an open evaluation system in which the crewman's performance is discussed prior to leaving the ship.
- Improved the narrative content of its crew evaluation system.
- Initiated a training program to increase masters' and officers' familiarisation with voyage data recorders.
- Ensured that VDR data recovery is practised during emergency drills.

Triton Schiffahrts GmbH has:

- Carried out an intensive debriefing and incident root cause analysis with the master and the bridge officers on board at the time of the accident.
- Extensively re-familiarised the master in the application of the COLREGS and bridge resource management techniques.
- Disseminated its analysis of the incident to its fleet, with specific focus on the COLREGS, STCW, and bridge resource management procedures.

SECTION 5 – RECOMMENDATIONS

Due to the actions taken by both Zodiac Maritime Agencies Limited and Triton Schiffahrts GmbH following the accident, no recommendations have been made.

Marine Accident Report

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