ACCIDENT REPORT

Report on the investigation of the collision between

the container vessel

ANL Wyong

and the gas carrier

King Arthur

in the approaches to Algeciras, Spain

on 4 August 2018

MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

SERIOUS MARINE CASUALTY REPORT NO 7/2020 MARCH 2020

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

AB	-	Able-bodied seaman
AIS	-	Automatic Identification System
ARPA	-	Automatic Radar Plotting Aid
BV	-	Bureau Veritas
COG	-	Course Over the Ground
COLREGS	-	See IRPCS
CCISC	-	CMA CGM International Shipping Company Pte. Ltd
CPA	-	Closest Point of Approach
DOC	-	Document of Compliance
DSC	-	Digital Selective Calling
ECDIS	-	Electronic Chart Display and Information System
GIBREP	-	Strait of Gibraltar Reporting System
GPA	-	Gibraltar Port Authority
GPS	-	Global Positioning System
IALA	-	International Association of Marine Aids to Navigation and Lighthouse Authorities
ICS	-	International Chamber of Shipping
IMO	-	International Maritime Organization
IRPCS	-	International Regulations for Preventing Collisions at Sea, 1972, as amended. Also referred to as the COLREGS
ISM	-	International Safety Management Code
m	-	Metre
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
MMSI	-	Maritime Mobile Service Identity
nm	-	Nautical mile
NUC	-	Not under command
OCIMF	-	Oil Companies International Marine Forum
OOW	-	Officer of the Watch
RAM	-	Restricted in ability to manoeuvre
SIRE	-	Ship Inspection Report Programme

SMC	-	Safety Management Certificate
SMS	-	Safety Management System
SOG	-	Speed Over the Ground
STCW	-	International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended
TMSA	-	Tanker Management and Self-Assessment
UK	-	United Kingdom
UTC	-	Universal Co-ordinated Time
UUE	-	Underway Using Engine
VDR	-	Voyage Data Recorder
VHF	-	Very High Frequency

TIMES: all times used in this report are UTC+2 unless otherwise stated.

SYNOPSIS

At 0636 on 4 August 2018, the UK registered container vessel *ANL Wyong* and the Italian registered gas carrier *King Arthur* collided 4 nautical miles south-east of Europa Point, Gibraltar. Both vessels were damaged but there was no pollution or injury.

The collision occurred in darkness, dense fog and in an area of heavy shipping traffic. *ANL Wyong* was stopped, having been given direction by Algeciras Pilots to wait outside Gibraltar Bay. *King Arthur* was making way towards a boat transfer position inside Gibraltar Bay.

King Arthur's master was conning, and altered course to starboard intending to pass astern of *ANL Wyong*. Although *King Arthur*'s master could not see *ANL Wyong*, his assessment of the situation was primarily based on automatic identification system data. However, *ANL Wyong* was stopped in the water and not making way as *King Arthur*'s master had perceived. As a result, the decision to turn *King Arthur* to starboard actually had the effect of putting the vessels on a collision course. When *King Arthur*'s master realised that a dangerous situation was developing, full starboard rudder was applied; however, this action came too late to prevent the collision. *ANL Wyong*'s officer of the watch was monitoring the situation but took no action when it became apparent that a multiple close quarters situation was unfolding.

The accident happened because neither bridge team appreciated the risk of collision in sufficient time to take effective action to pass at a safe distance. The investigation also identified that very high frequency radio conversations were a significant distraction on board *King Arthur*. Additionally, although the collision occurred within a designated vessel traffic service area, neither vessel received a warning of the risk of collision from ashore.

Following the accident the managers of both vessels have carried out investigations and have taken steps to help prevent a reccurence.

A recommendation has been made to the Spanish Government's Ministry of Development to review the provision of vessel traffic services in the approaches to Algeciras. A recommendation has also been made to the Maritime and Coastguard Agency to propose a review to the navigation status descriptor fields used in the automatic identification system.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *ANL WYONG, KING ARTHUR* AND THE ACCIDENT

SHIP PARTICULARS		
Vessel's name	*ANL Wyong*	*King Arthur*
Flag	United Kingdom	Italy
Classification society	Bureau Veritas	RINA Services S.p.A
IMO number	9334155	9480382
Type	Container vessel	Gas carrier
Registered owner	SNC Fenice Bail 2	Mediterranea Di Navigazione S.p.A
Manager(s)	CMA CGM International Shipping Company Pte. Ltd	Mediterranea Di Navigazione S.p.A
Construction	Steel	
Year of build	2008	
Length overall	260.0m	103.9m
Registered length	246.79m	97.12m
Gross tonnage	39906	4761
Minimum safe manning	15	14
Authorised cargo	Containers	Gas products

VOYAGE PARTICULARS		
Port of departure	Douala, Cameroon	Kulevi, Georgia
Port of arrival	Algeciras, Spain	Rotterdam, Netherlands
Type of voyage	International	
Cargo information	1378 ISO containers	2126m³ propylene
Manning	22	18

MARINE CASUALTY INFORMATION		
Date and time	0636 (UTC+2), 4 August 2018	
Type of marine casualty or incident	Serious Marine Casualty	
Location of incident	36˚04.1'N - 005°16.6'W 4nm south-east of Europa Point, Gibraltar	
Place on board	Hull	
Injuries/fatalities	None	
Damage/environmental impact	Impact damage to hull, steering compartment and CO_2 room	Impact damage to port bow
Ship operation	On passage	
Voyage segment	Arrival	

MARINE CASUALTY INFORMATION		
External & internal environment	Wind: westerly at 10 – 15 knots Current: north-easterly at 2 knots Visibility: darkness, dense fog	
Persons on board	22	18

Image courtesy of Marine Traffic.com

ANL Wyong

Image courtesy of Sakis Antoniou and Marine Traffic.com

King Arthur

1.2 NARRATIVE

1.2.1 Events prior to the collision

King Arthur was on passage from Kulevi, Georgia to Rotterdam, the Netherlands via Gibraltar Bay to embark personnel by boat transfer. *ANL Wyong* was on passage from Douala, Cameroon to Algeciras, Spain **(Figure 1)**.

At 0345 on 4 August 2018, *ANL Wyong*'s third officer took over as officer of the watch (OOW); the deck cadet and an able-bodied seaman (AB) were also on the bridge. It was dark, and visibility was poor in patchy fog. *ANL Wyong*'s navigation lights were on, sound signals were being made and the 'restricted visibility' bridge checklist had been completed. At 0424, when *ANL Wyong* was in the eastbound lane of the Strait of Gibraltar traffic separation scheme (TSS), the third officer contacted the Port of Algeciras Pilots' Corporation (Algeciras Pilots) using very high frequency (VHF) radio, channel 13. A transcript of the conversation is at **Table 1**.

Time	Station	Transmission
0424:06	*ANL Wyong*	*"Algeciras pilot station, Algeciras pilot station, motor vessel ANL Wyong."*
0424:13	Algeciras Pilots	*"ANL Wyong, Algeciras Pilots"*
0424:16	*ANL Wyong*	*"Morning ma'am, our ETA to pilot station, 0600, over"*
0424:20	Algeciras Pilots	*"OK, ETA 0600, sir, according to the terminal, the vessel at your berth is expected to finish cargo operations at 0700, seven o'clock in the morning, so, do not proceed inside the Bay, wait outside, standing by all the time on channel 13 and waiting for our instructions"*
0424:46	*ANL Wyong*	*"Roger, stand by channel 13, waiting for further instruction…"*
0425:00	Algeciras Pilots	*"…but please remember, do not enter in the bay, OK, do not enter in the bay, wait at least 3 miles from the bay entrance."*
0425:07	*ANL Wyong*	*"Roger, well understood, we will keep clear of the bay, at least 3 nautical miles…thank you ma'am."*

Table 1: Transcript of the VHF radio conversation between *ANL Wyong*'s OOW and Algeciras Pilots

ANL Wyong's OOW then called the master, who came to the bridge to assess the situation. Given the information received from Algeciras Pilots, the master decided to amend the passage plan and proceed to a waiting position about 3 nautical miles (nm) east of the entrance to Gibraltar Bay. The navigational track in *ANL Wyong*'s electronic chart display and information system (ECDIS) was amended to show the intended waiting position **(Figures 2a** and **2b)**.

Reproduced from Admiralty Chart 0773 by permission of HMSO and the UK Hydrographic Office

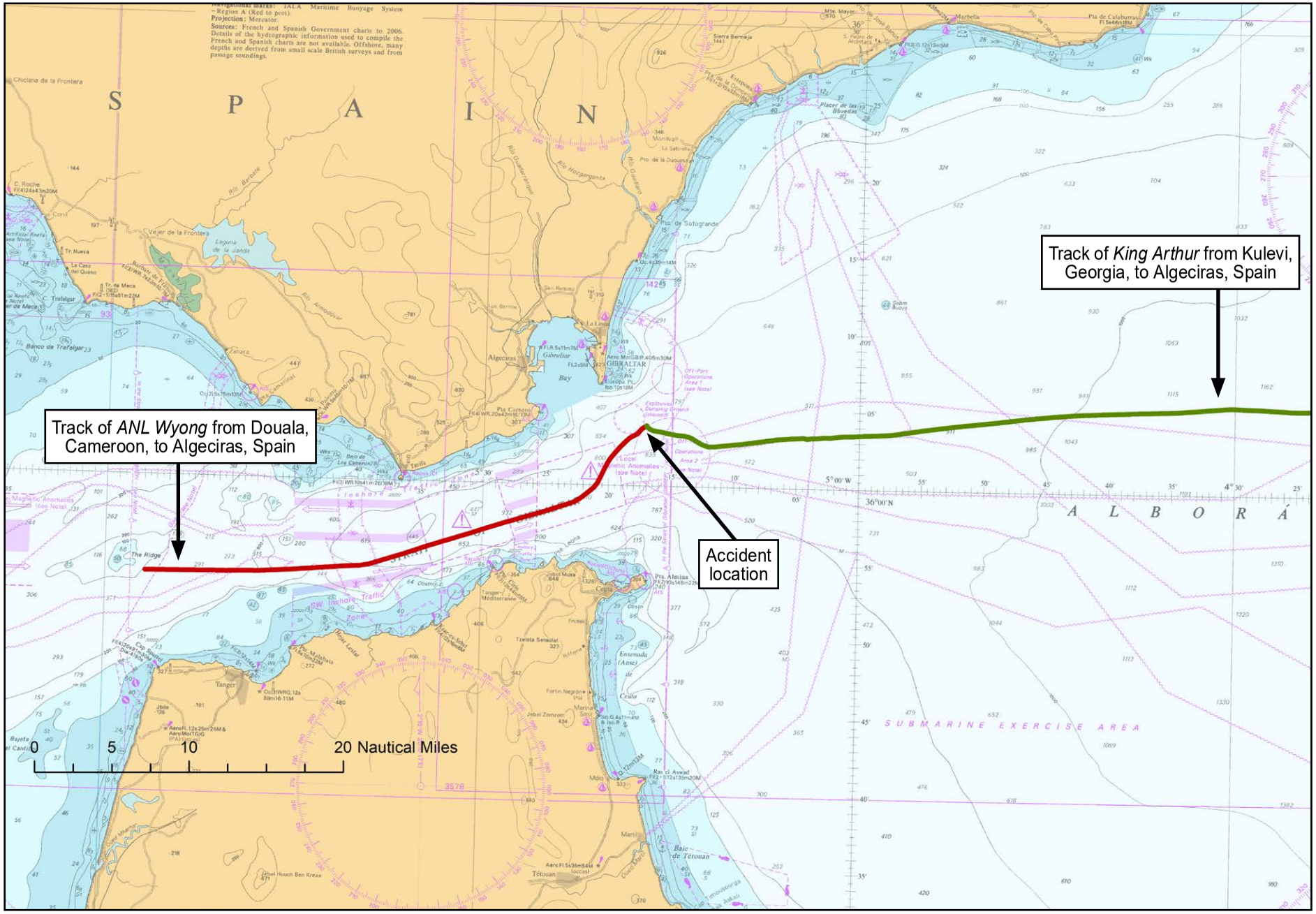

Figure 1: Chart showing an overview of the tracks of *ANL Wyong* and *King Arthur* including the collision location (other vessels excluded)

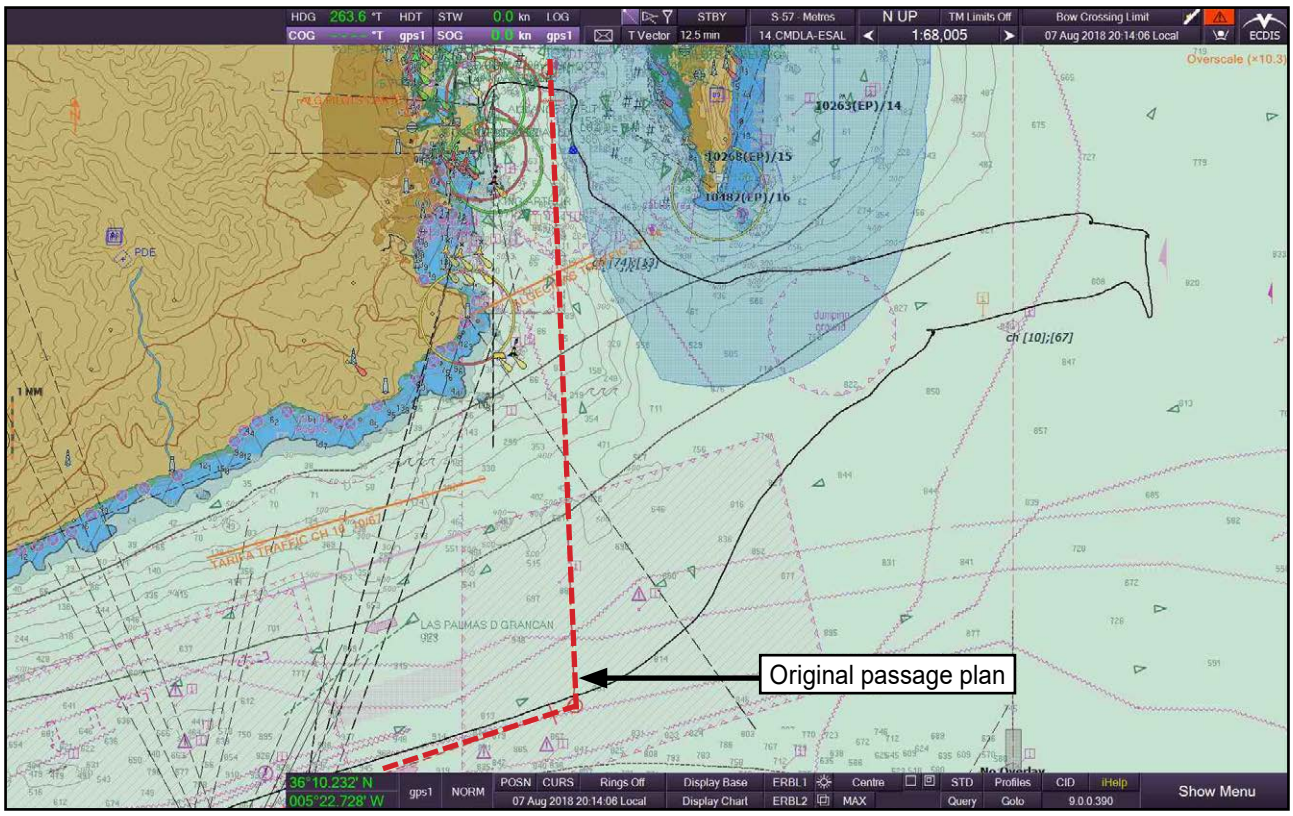

Figure 2a: *ANL Wyong*'s ECDIS display showing the original passage plan to Algeciras

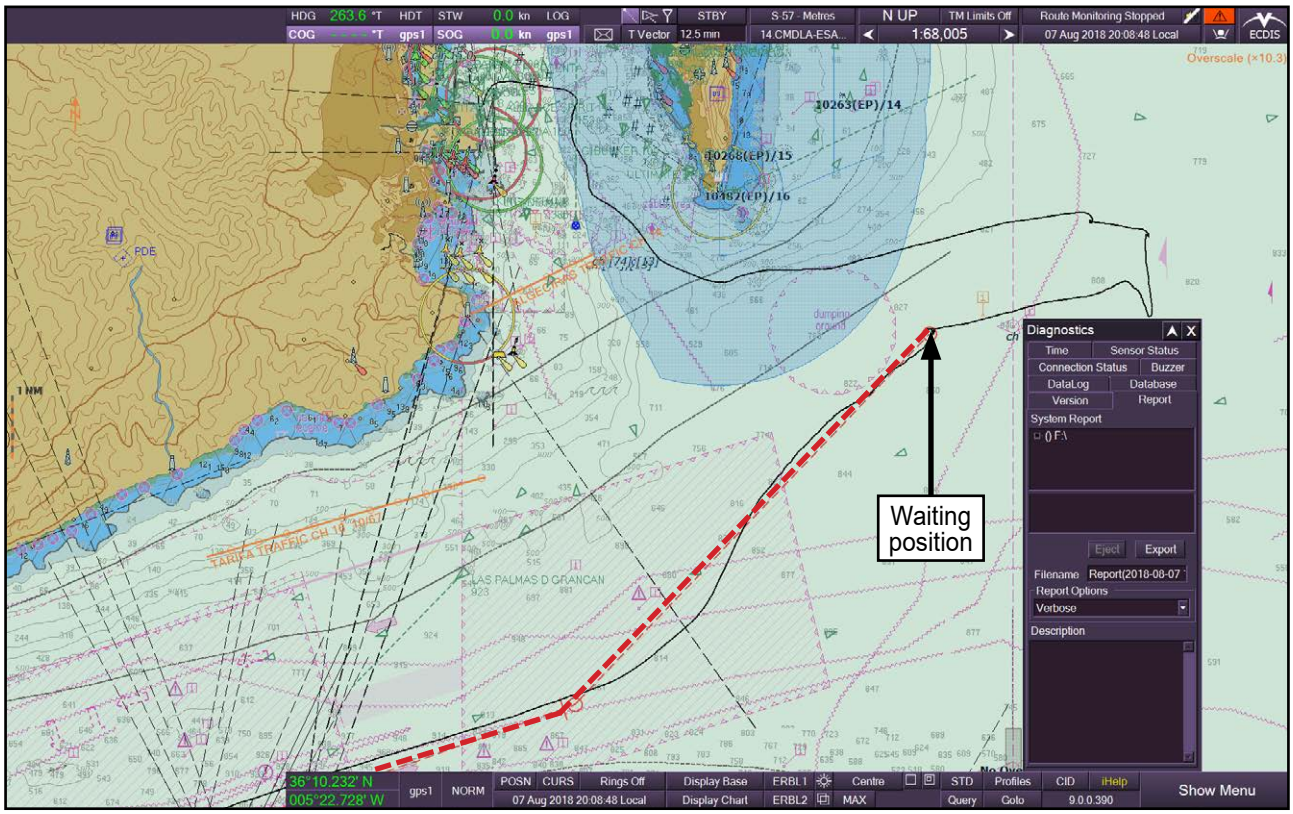

Figure 2b: *ANL Wyong*'s ECDIS display showing the amended track to the waiting position

Due to the shipping density, *ANL Wyong*'s master took the con from the OOW for the passage to the waiting position. The fog was dense, and several other vessels were detected on radar nearby but not observed visually.

ANL Wyong arrived at the waiting position at 0521; the engine was then stopped but remained at immediate notice, upper deck lighting was switched on and the con was passed back to the OOW. In the waiting position, the traffic level was assessed as moderate with westbound shipping passing to the south. *ANL Wyong*'s radar picture at 0531 is at **Figure 3**; at this time, the vessel's heading was north-westerly,

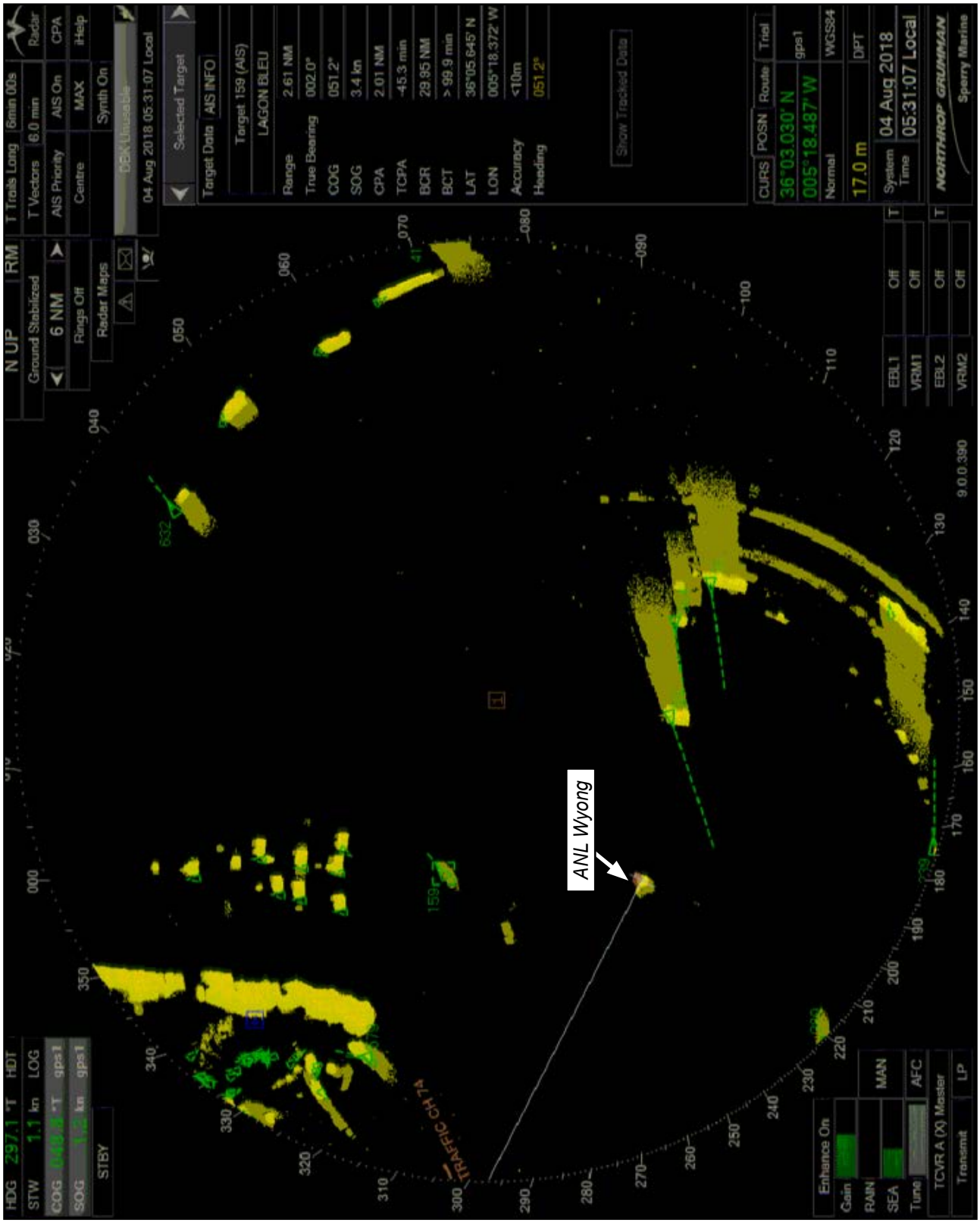

Figure 3: *ANL Wyong*'s starboard radar display at 0531 showing shipping traffic levels prior to the master leaving the bridge

and it was drifting slowly in a north-easterly direction. At 0548, the master left the bridge, leaving the OOW, the lookout and the deck cadet on watch. The OOW then monitored the shipping situation from the starboard side of the bridge console where he had access to radar and ECDIS displays as well as VHF radio **(Figure 4)**.

At 0600, *King Arthur*'s chief officer, who was the OOW, called the master and informed him that there was 1 hour to go before the planned boat transfer in Gibraltar Bay. *King Arthur*'s master came to the bridge and, after a handover brief from the OOW, took the con for the approach to the boat transfer position. When conning, *King Arthur*'s master was on the port side of the bridge horseshoe **(Figure 5)** where he had access to radar and ECDIS displays. The chief officer remained on the bridge to support the master, and he worked on the starboard side where he had access to radar and ECDIS displays as well as VHF radio **(Figure 5)**.

At 0616 *King Arthur*'s master altered course from 270° to 290°, the vessel's speed was 13.5 knots (kts). The aim of the alteration was to pass astern of the general cargo vessel *Hadeland* **(Figure 6)**. The alteration created a potential close quarters situation with the container ship *MSC Judith*. At the same time, *ANL Wyong*'s OOW was monitoring numerous shipping contacts approaching from the east with two showing a closest point of approach (CPA) less than the alarm setting[1] **(Figure 7)**.

MSC Judith called *King Arthur* at 0621 using VHF radio; *King Arthur*'s chief officer responded to the call, with the master also listening to the exchange. A transcript of the VHF radio conversation is at **Table 2**.

Time	Station	Transmission
0621:16	*MSC Judith*	*"Motor tanker King Arthur, motor tanker King Arthur, MSC Judith"*
0621:25	*King Arthur*	*"Yes"*
0621:30	*MSC Judith*	*"Motor tanker King Arthur, King Arthur, MSC Judith"*
0621:36	*King Arthur*	*"Yes, go ahead"*
0621:40	*MSC Judith*	*"Yes, it's MSC Judith, vessel ahead of you, 1.4 miles, so please keep clear, I will keep this speed and course"*
0621:45	*King Arthur*	*"Okay"*
0621:47	*MSC Judith*	*"Good watch"*

Table 2: Transcript of the VHF radio conversation between *MSC Judith* and *King Arthur*

During this conversation, *King Arthur*'s master commenced a slow turn to port with the vessel settling on a new heading of 275°; the aim of this alteration was to keep clear of *MSC Judith* **(Figure 6)**.

Between 0626 and 0629, *King Arthur*'s chief officer made VHF radio calls to the Algeciras Traffic and Tarifa Traffic stations, and submitted the vessel's details and navigational intentions.

[1] The CPA alarm setting on board *ANL Wyong* was 0.4nm. When an approaching vessel's CPA was less than this value, the contact's symbol on the radar display switched from green to red.

Figure 4: The starboard side of *ANL Wyong*'s bridge console showing the radar and ECDIS displays in use by the OOW

Figure 5: *King Arthur*'s bridge horseshoe arrangement showing the displays in use by the master and OOW

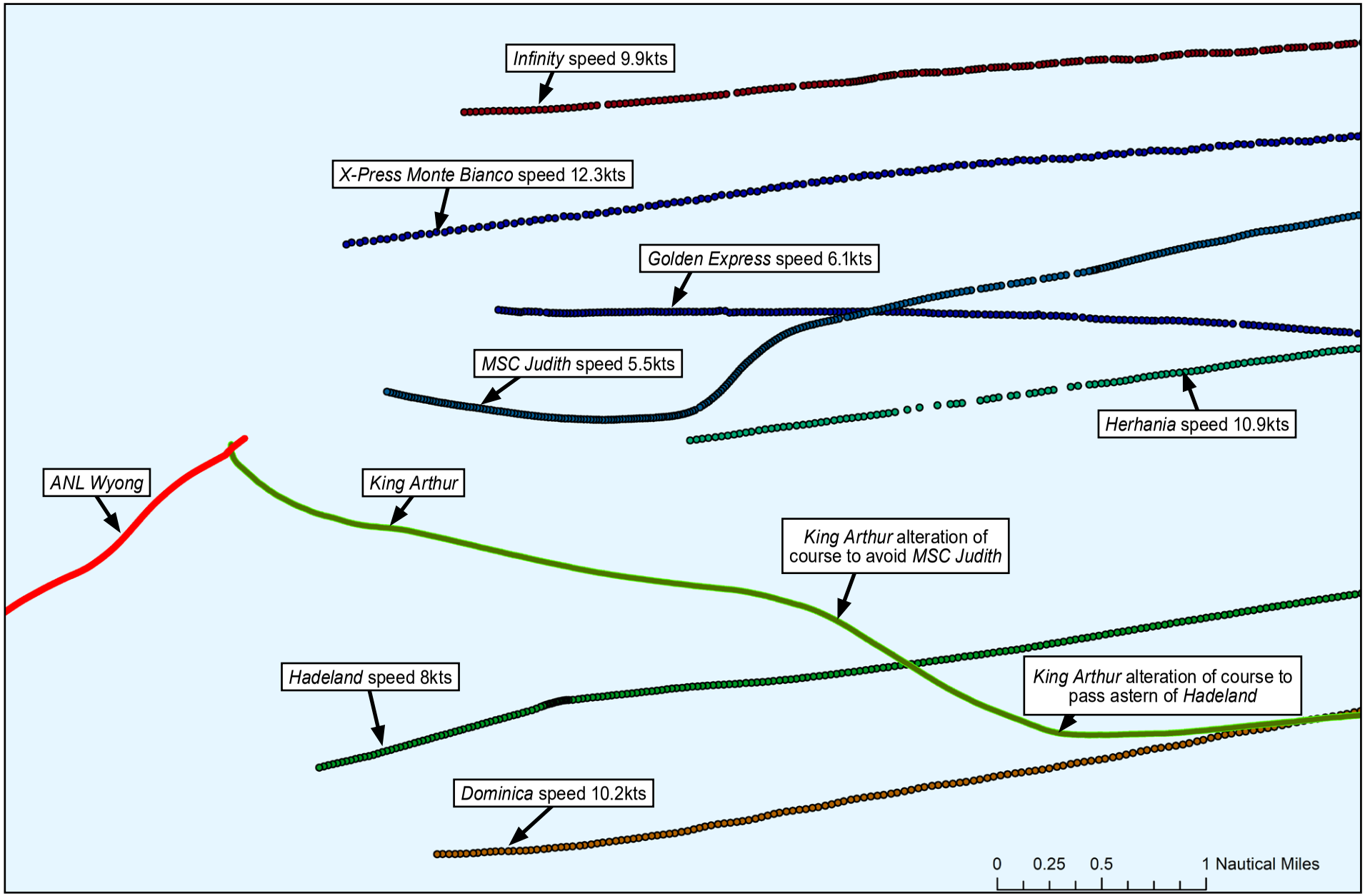

Figure 6: Tracks of eight closest vessels proceeding towards *ANL Wyong* and showing *King Arthur*'s heading alterations

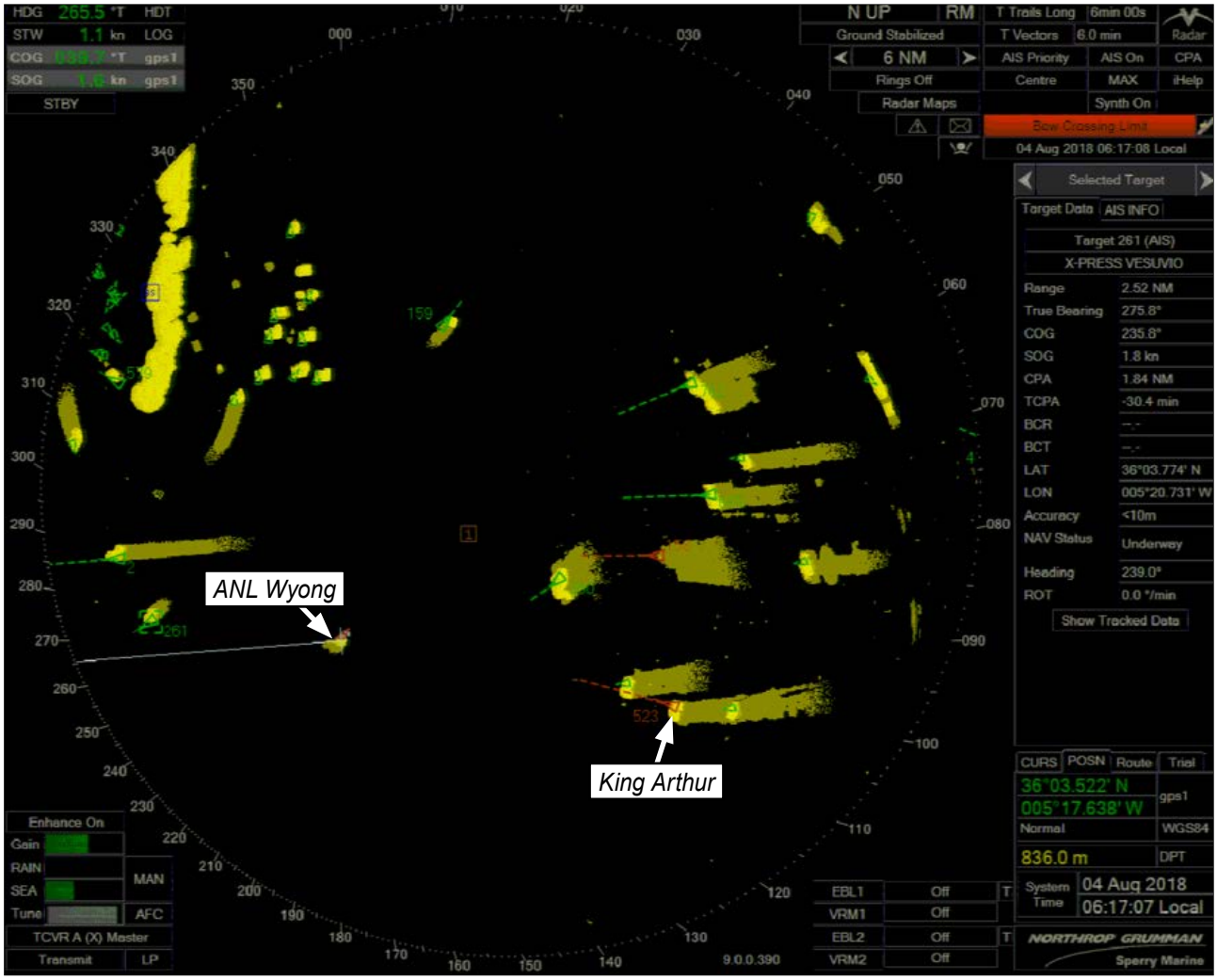

Figure 7: *ANL Wyong*'s starboard radar display at 0617 showing nine radar contacts approaching from the east

Having completed the turn to port, *King Arthur*'s master observed a new radar contact about 2.4nm ahead **(Figure 8)**. From automatic identification system (AIS) data, *King Arthur*'s master established that the new contact was *ANL Wyong* and, from the orientation of the AIS symbol, that it was heading in a south-westerly direction. The master also observed from AIS information that *ANL Wyong*'s navigational status was '*underway using engine*'. At the same time, *King Arthur*'s chief officer was monitoring the situation and had noted that *ANL Wyong*'s predicted CPA was 0.3nm on *King Arthur*'s starboard side.

At 0632 *ANL Wyong* was stopped in the water on a heading of 197˚; due to the north-easterly current, its course and speed over the ground (COG and SOG) was 060˚ at 2.2kts. *ANL Wyong*'s OOW continued to monitor the situation and the radar display was still showing numerous contacts approaching from the east with three CPAs, including *King Arthur*'s, below the alarm value and shown in red **(Figure 9)**. By this time, the visibility was very poor in dense fog. Aware of the numerous vessels approaching on the port side and the poor visibility, *ANL Wyong*'s OOW sent the deck cadet to the port bridge wing to keep lookout there.

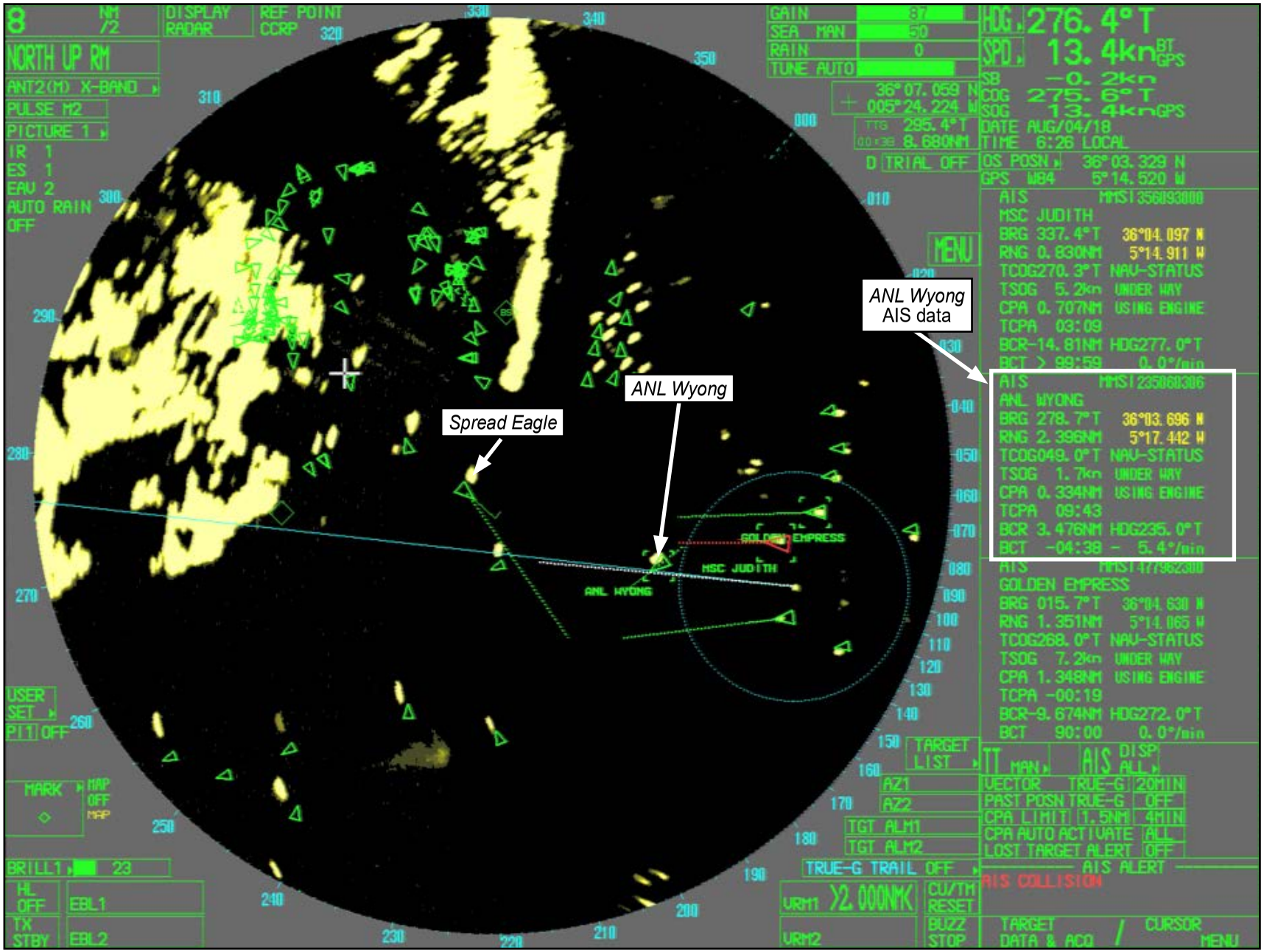

Figure 8: *King Arthur*'s starboard radar display at 0626, in use by the OOW, showing *ANL Wyong* ahead of *King Arthur* and AIS data selected in the target data section

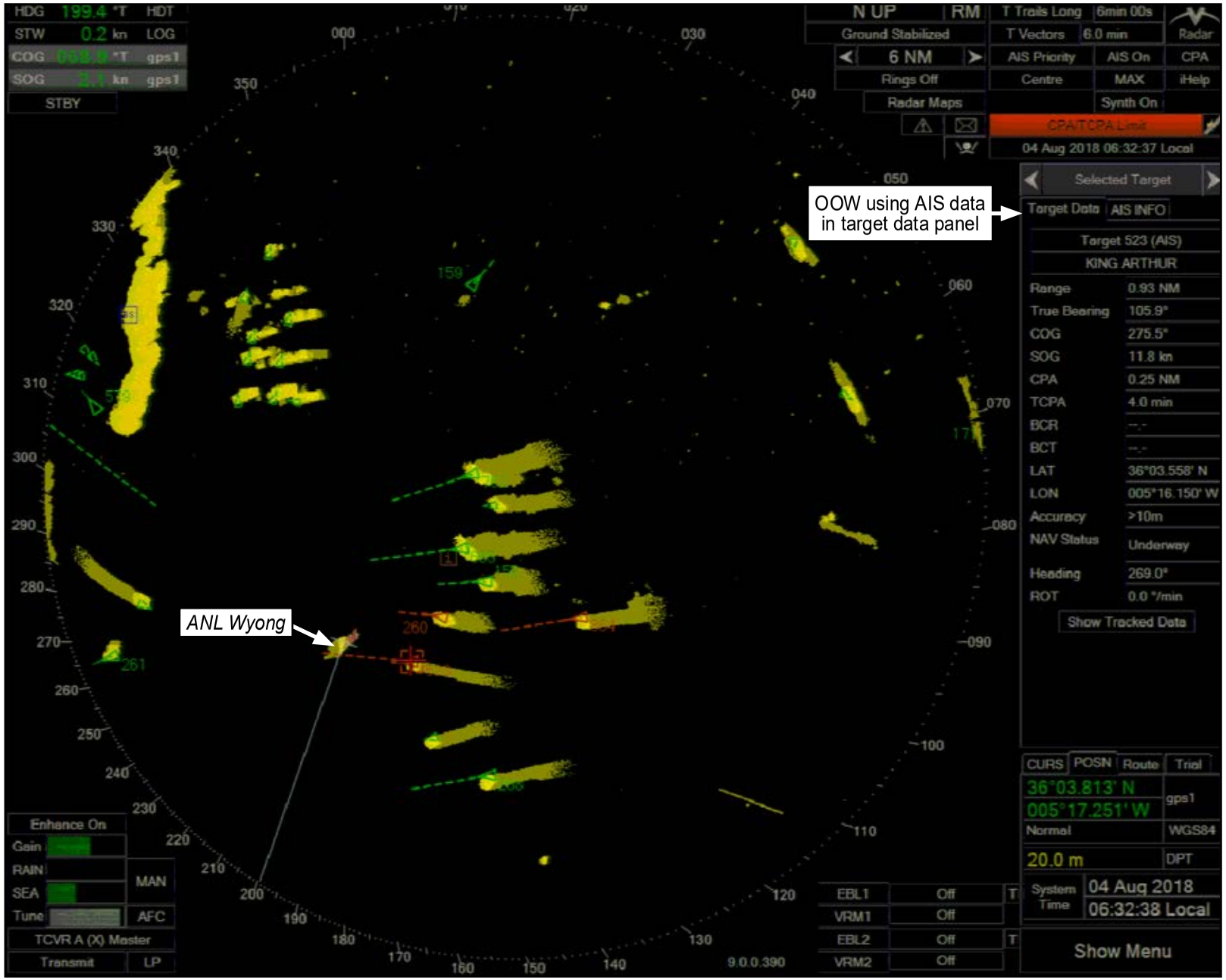

Figure 9: *ANL Wyong*'s starboard radar display at 0632 showing three contacts with CPA values below 0.4nm and AIS data selected in the target data section

At 0633, *King Arthur*'s chief officer responded to a VHF radio call from the tanker *Spread Eagle* **(Figure 8)**; a transcript of the conversation is in **Table 3**.

Time	Station	Transmission
0633:52	*Spread Eagle*	*"King Arthur, King Arthur, Spread Eagle"*
0633:58	*King Arthur*	*"Yes, go ahead, this is King Arthur"*
0634:00	*Spread Eagle*	*"Channel zero six please"*
0634:03	*King Arthur*	*"Zero six"*
0634:06	*Spread Eagle*	*"Sir, Spread Eagle"*
0634:08	*King Arthur*	*"the name of the vessel"*
0634:11	*Spread Eagle*	*"King Arthur…um…vessel...ah…this right, right ahead of you, this, I tell you, what is your intentions sir"*
0634:20	*King Arthur*	*"What is the name of the vessel, what is the name of the vessel?"*
0634:21	*Spread Eagle*	*"Spread Eagle, Spread Eagle"*
0634:22 until 0635:02		Pause in transmissions
0635:02	*Spread Eagle*	*"King Arthur, Spread Eagle"*
0634:04	*King Arthur*	*"Yes, go ahead"*
0635:14	*King Arthur*	*"Spread Eagle, King Arthur"*
	Spread Eagle	*"Ah…yes Sir, what is your intentions, Sir"*
0635:21	*King Arthur*	*"Don't worry, we have CPA 0.6, okay, 0.6 CPA, okay, I alter course to my starboard side, don't worry"*
0635:31	*Spread Eagle*	*"Okay sir, thank you very much for your…"*

Table 3: Transcript of the VHF radio conversation between *Spread Eagle* and *King Arthur*

1.2.2 The collision

During the VHF radio conversation with *Spread Eagle* **(Table 3)**, *King Arthur*'s master made an alteration of course to starboard **(Figure 10)** to a heading of 300° intending to avoid *ANL Wyong* by passing its stern. This course change was also intended to increase the CPA of *Spread Eagle*, which was approaching to port. Noticing that the CPA of *ANL Wyong* had not increased as expected, *King Arthur*'s master increased to full starboard rudder. At the same time, the OOW of *ANL Wyong* noticed that the CPA of *King Arthur* was reducing, so he used the VHF radio to attempt to establish communications with *King Arthur*.

Moments prior to collision, both the master and chief officer of *King Arthur* saw the superstructure deck lights of *ANL Wyong* emerging from the foggy darkness ahead; the lights were spotted very close on the port bow. *King Arthur*'s port bow struck *ANL Wyong*'s port quarter at 0636. None of *ANL Wyong*'s bridge team saw *King Arthur*, including the deck cadet, who was on the port bridge wing.

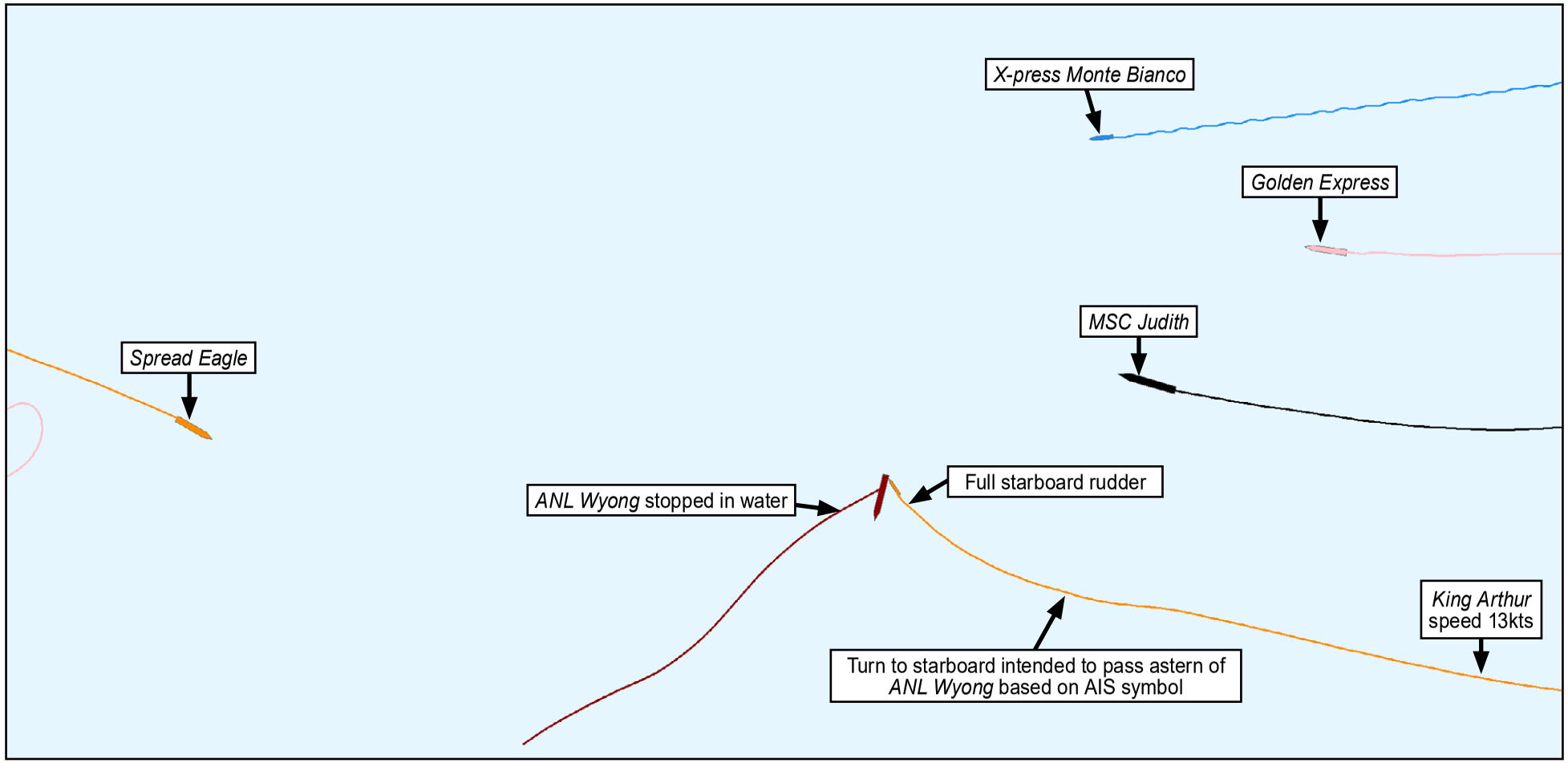

Figure 10: Plot showing the tracks of *ANL Wyong* and *King Arthur* prior to collision

1.2.3 Post-collision

Immediately after the collision, *King Arthur*'s master put the rudder hard to port in an attempt to swing the vessel's stern away from *ANL Wyong*.

ANL Wyong's master, who was in his cabin, heard and felt a heavy vibration, so phoned the bridge to ask the OOW what had happened; the OOW answered the phone and asked the master to proceed to the bridge immediately.

On board *King Arthur*, the crew were tasked to search for damage, and it was soon established that there was no water ingress but that serious damage had been sustained on the port bow.

When *ANL Wyong*'s master arrived on the bridge, he assessed the situation and realised that, although nothing had been seen visually by the bridge team, it was highly likely that the collision had been with *King Arthur*. *ANL Wyong*'s master then called Tarifa Traffic vessel traffic service (VTS) to report the collision. Meanwhile, *ANL Wyong*'s chief officer led a search party to find the damage. It soon became apparent that *ANL Wyong* had been struck and holed on the port side aft above the waterline.

Tarifa Traffic VTS contacted both vessels and directed them to proceed to Algeciras. Later in the morning of 4 August, *King Arthur* anchored close to Algeciras harbour and *ANL Wyong* proceeded alongside. After Port State Control inspections, both vessels were detained subject to completion of repairs.

Both vessels were significantly damaged by the collision. An area of approximately 14 x 3 metres (m) on *ANL Wyong*'s port quarter was dented, holed and scraped, with the hull penetrated in several places **(Figure 11)**. The port side of *King Arthur*'s bow flare was badly damaged **(Figure 12)**.

1.3 ENVIRONMENTAL CONDITIONS

The wind was westerly at 10 – 15kts and the current was setting in a north-easterly direction at about 2kts. It was dark and visibility was very poor in dense fog.

1.4 *ANL WYONG*

1.4.1 General

Built in 2008 and registered in Hull, UK, *ANL Wyong* was a 39,906gt container vessel with a registered length of 246.79m. *ANL Wyong* was propelled by a 36,560kW main engine giving a maximum speed of 22.5kts. At the time of the accident, *ANL Wyong* was laden with 1378 ISO containers.

1.4.2 Crew

ANL Wyong's crew of 22 complied with the Flag State's minimum safe manning requirement and was composed of Chinese officers and Sri Lankan crew; English was the language spoken on board.

ANL Wyong's master was a 37-year-old Chinese national; this was his second contract as master. *ANL Wyong*'s OOW at the time of the collision was a 26-year-old Chinese national in his first contract as a third officer and certified watchkeeper.

Figure 11: Detail of damage to *ANL Wyong*'s port quarter

Figure 12: Detail of damage to *King Arthur*'s port bow

1.4.3 Navigation

ANL Wyong's primary means of navigation was ECDIS, and all the deck officers had completed generic and type-specific training.

ANL Wyong's bridge console included two radar and two ECDIS displays. At the time of the accident, the OOW was monitoring the situation from the starboard side of the main console **(Figure 4)**. The radar system was capable of analysing target data using both AIS and automatic radar plotting aid (ARPA) information; the OOW's radar display was set to prioritise AIS information.

1.4.4 Standing and night orders

The master's standing orders stated that the OOW was required to comply with the International Regulations for Preventing Collisions at Sea (IRPCS) and that the master was to be called in dense traffic or if the movements of other vessels caused concern, or any circumstance where the OOW needed assistance.

The master's night orders **(Figure 13)** required the OOW to follow the standing orders and to call the master if in any doubt. The night orders also required that the OOW was to keep a good lookout, follow the IRPCS and achieve the planned 0600 arrival time at the Algeciras pilot station.

1.4.5 Safety management

ANL Wyong was one of 509 vessels operated by the CMA CGM Group and was managed by CMA CGM International Shipping Company Pte. Ltd (CCISC) from CMA CGM's Singapore office. The company operated a fully integrated safety management system (SMS) that assured compliance with the International Maritime Organization's (IMO) International Safety Management Code (ISM Code). *ANL Wyong*'s safety management certificate (SMC) was issued by Bureau Veritas (BV) and was valid until 6 March 2023. The SMC stated that the vessel's SMS was fully compliant with the ISM Code. CCISC held a document of compliance (DOC), valid until 16 November 2019, certifying the company's compliance with the ISM Code.

CCISC's bridge manual stated that the safe passing distance (minimum CPA) was 2nm in the open sea or 0.4nm in restricted waters. The bridge manual also stated that *'VHF radio should not be used for collision avoidance purposes. Valuable time can be wasted attempting to make contact, since positive identification may be difficult, and once contact has been made misunderstandings may arise. Although the use of VHF radio may be justified on occasion as a collision avoidance aid, the provision of the Collision Regulations should remain uppermost'.*

1.5 *KING ARTHUR*

1.5.1 General

Built in 2008 and registered in Ravenna, Italy, *King Arthur* was a 4,761gt gas carrier with a registered length of 97.12m. It was owned and managed by Mediterranea di Navigazione S.p.A. *King Arthur* was propelled by a 4,000kW main engine giving a service speed of 16kts. The vessel had a single controllable pitch propeller and a Becker style rudder, giving a high degree of manoeuvrability. At the time of the accident, *King Arthur* was laden with 2126m³ of propylene.

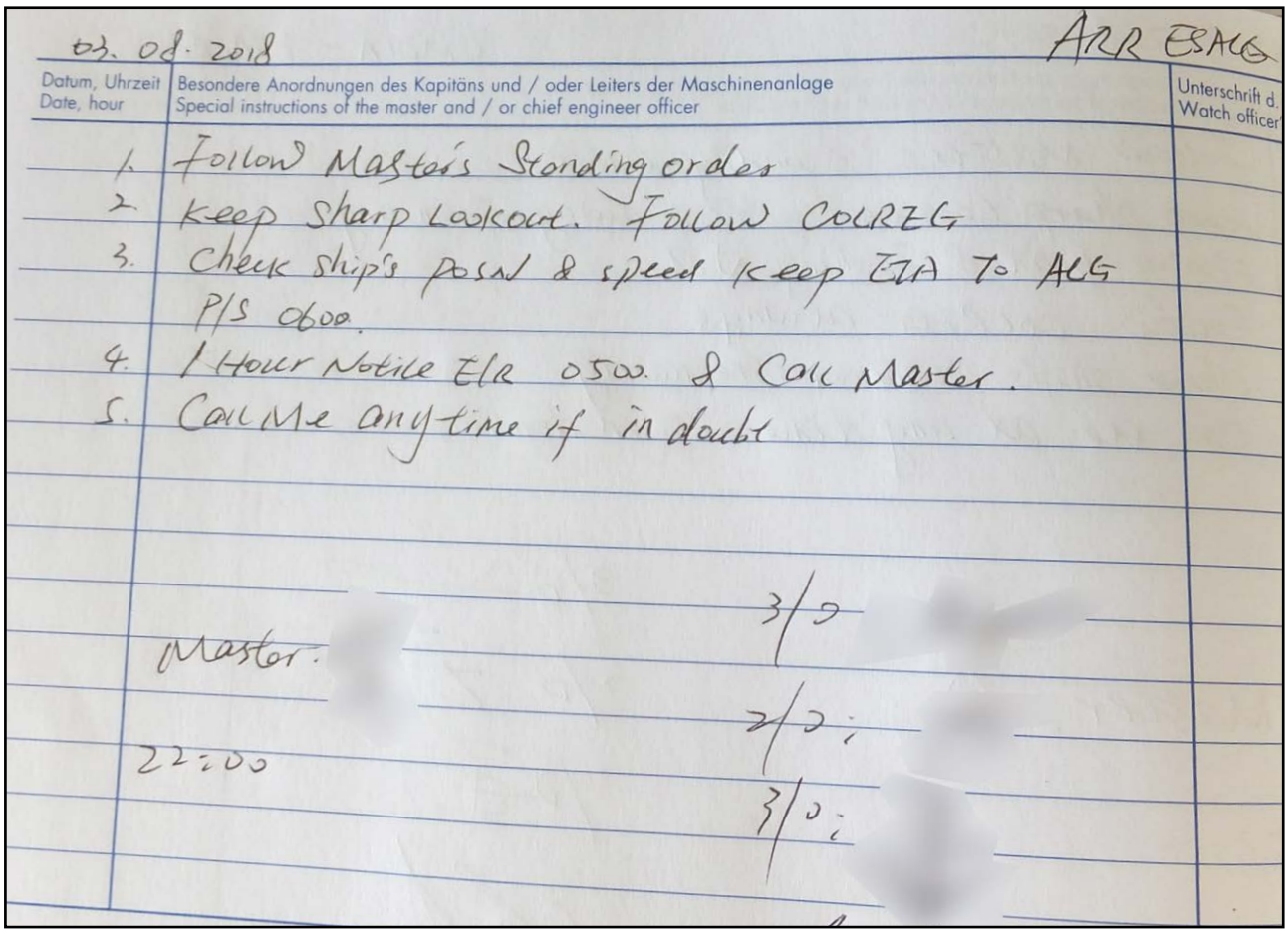

Figure 13: *ANL Wyong* - master's night orders

1.5.2 Crew

King Arthur's crew of 18 complied with the Flag State's minimum safe manning and was composed of Italian, Romanian and Filipino nationals. English was the official language on board; Italian was also spoken among the officers.

King Arthur's master was a 64-year-old Italian national who had been with the company as a master for 14 years. He was well regarded and this was his fourth contract in command of *King Arthur*. The chief officer, who was the OOW at the time of the accident, was a 31-year-old Romanian national who had been with the company for 8 years and had worked his way from deck cadet to chief officer. This was his first contract as a chief officer that had started in April 2018.

At the time of the accident, the master was conning, the chief officer was the OOW; there was also an Italian deck cadet on the bridge as an additional lookout and a Filipino AB as helmsman.

1.5.3 Navigation

King Arthur's bridge layout was a horseshoe arrangement **(Figure 5)** with a central console for propulsion controls and two independent radar and ECDIS displays either side; both radars integrated ARPA and AIS data. The master was conning from the port side of the horseshoe and the chief officer was monitoring on the starboard side. *King Arthur*'s voyage data recorder (VDR) only recorded the radar picture on the starboard side of the bridge. Consequently, only the settings of

the OOW's radar could be verified after the accident. VDR data showed that the OOW's target data section on the starboard radar display was prioritising AIS data for selected tracks. The master's display was reported to be set to prioritise ARPA information.

King Arthur's primary means of navigation was paper charts, and an appropriate outfit of charts and nautical publications was carried. The chart table was on the starboard side of the bridge behind the horseshoe, and was easily accessible by the OOW. An image of the chart in use at the time is at **Figure 14** and shows the intended passage to the boat transfer position in Gibraltar Bay. Although not the primary method of navigation, ECDIS was fitted on board and was in use by the vessel's bridge watchkeeping officers who had all completed ECDIS training courses.

1.5.4 Safety management

King Arthur was one of 10 specialised gas, chemical and oil product carriers owned and managed by Mediterranea Di Navigazione S.p.A. The company operated an SMS that assured compliance with the ISM Code.

King Arthur's SMC was issued by the Italian Ministry of Infrastructure and Transport and was valid until 23 May 2021 stating that the vessel's SMS was compliant with the ISM Code. Mediterranea Di Navigazione S.p.A held a DOC, valid until 26 July 2021, certifying the company's compliance with the ISM Code.

As a gas and oil product carrying company, Mediterranea Di Navigazione S.P.A's safety management was also subject to OCIMF[2]'s SIRE[3] and TMSA[4] assessment regimes. Under the TMSA system, Mediterranea Di Navigazione's SMS consistently scored above the industry average.

King Arthur's SMS consisted of guidance chapters and operational checklists. It stated that:

> *'when restricted visibility is encountered or expected, the first responsibility of the Officer on watch, is to comply with the relevant rules of the international regulations for preventing collisions at sea, COLREG 1972, with particular regard to the sounding of fog signals, proceeding at a safe speed and having the engines ready for immediate manoeuvre; however the restricted visibility shall be considered each condition when the visibility fall under the 4 nautical miles'.*

Prior to the accident, the OOW had completed the preparations required by the following checklists:

- master on conning;
- navigation in restricted visibility;
- navigation in coastal waters; and
- pre-arrival checklist for the boat transfer at Algeciras.

[2] Oil Companies International Marine Forum

[3] Ship Inspection Report Programme

[4] Tanker Management and Self-Assessment

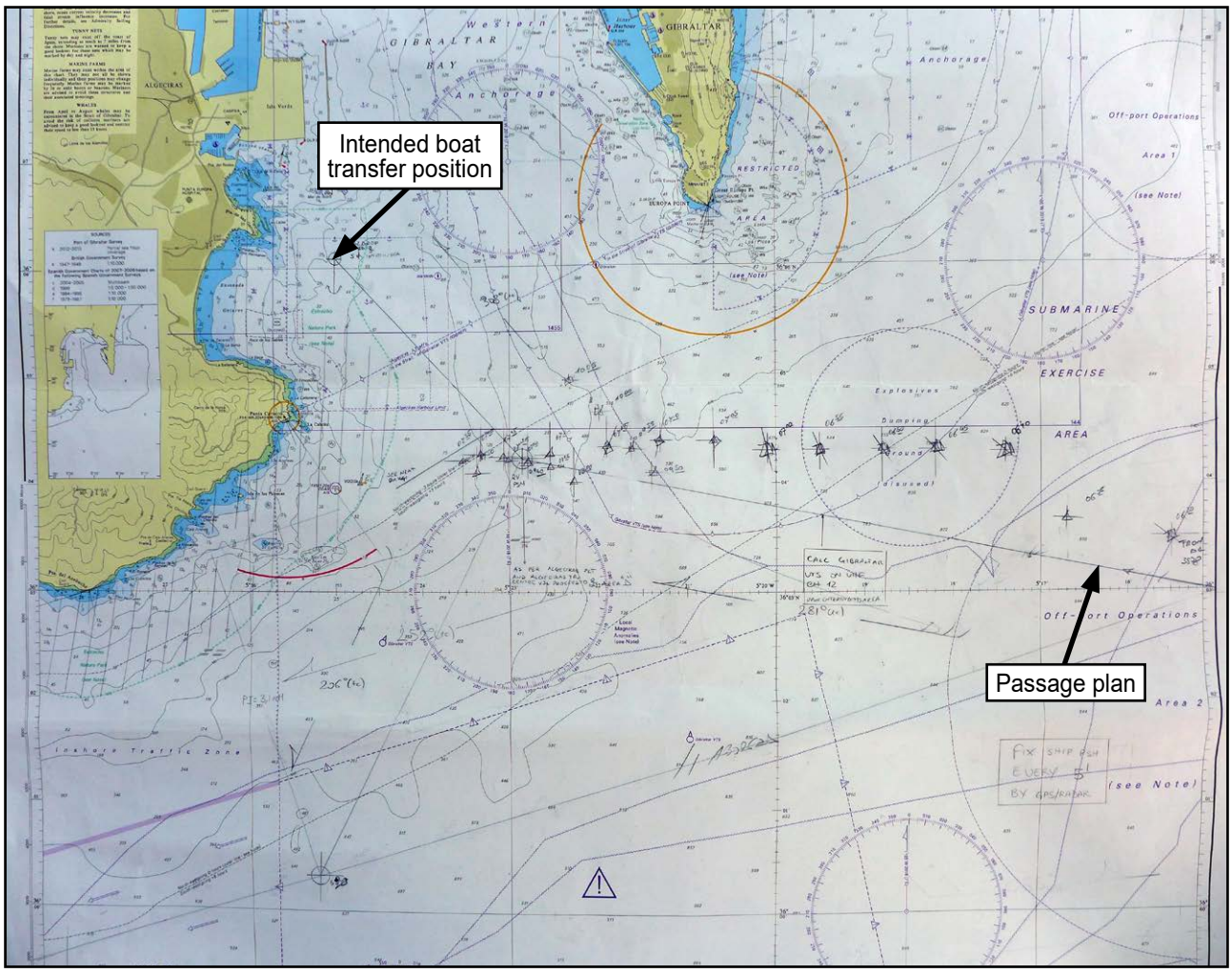

Figure 14: *King Arthur*'s paper chart in use at the time of the accident showing the passage plan to the boat transfer position

1.6 AUTOMATIC IDENTIFICATION SYSTEM INFORMATION

AIS information transmitted by a vessel is divided into three categories: static, voyage-related and dynamic. Static information included a vessel's name and maritime mobile service identity (MMSI). Voyage-related data was manually entered and related to the planned passage. Dynamic AIS information included automatically updated values from onboard equipment including COG and SOG derived from the global positioning system (GPS). Dynamic information also included the vessel's 'navigation status', which was updated manually. The available 'navigation status' settings were:

0. - underway using engine
1. - at anchor
2. - not under command
3. - restricted in ability to manoeuvre
4. - constrained by draught
5. - moored
6. - aground
7. - engaged in fishing
8. - underway by sail
11. - power driven vessel towing astern
12. - power driven vessel pushing ahead or towing alongside.

These values utilised 15[5] of the 16 data fields available in the system; one channel (15) was unallocated.

Guidance on the operational use of AIS was in IMO Resolution A.1106(29), which stated that '*the potential of AIS as an assistance for anti-collision device is recognized and AIS may be recommended as such a device in due time. Nevertheless, AIS information may merely be used to assist in collision avoidance decision-making. When using the AIS in the ship-to-ship mode for anti-collision purposes, the following cautionary points should be borne in mind:*

- *AIS is an additional source of navigational information. It does not replace, but supports, navigational systems such as radar target-tracking and VTS; and*

- *the use of AIS does not negate the responsibility of the OOW to comply at all times with the Collision Regulations, particularly rule 7 when determining whether risk of collisions exists.'*

At the time of the accident, AIS data showed that there were 11 vessels outside Gibraltar Bay waiting to enter either Algeciras or Gibraltar **(Figure 15)**. The majority of these vessels were between 8nm and 16nm east of Gibraltar and one vessel, the container ship *Xpress Vesuvio*, was nearby *ANL Wyong*. The AIS information being transmitted by these vessels is at **Table 4**.

AIS static data			**AIS voyage-related data (port of destination)**	**AIS dynamic data – navigational status**
Name	**Length (m)**	**Type**		
ANL Wyong	260	Cargo	Algeciras	UUE[6]
Xpress Vesuvio	133	Cargo	Algeciras	UUE
MV *Senorita*	190	Cargo	Gibraltar	UUE
MT Azra S	105	Tanker	Algeciras	NUC[7]
Ludwig Schulte	175	Cargo	Algeciras	NUC
Kite Bay	180	Cargo	Dnepr	UUE
CMA CGM Lapis	258	Cargo	Algeciras	UUE
CIC Rolaco	292	Cargo	Gibraltar	UUE
Cherokee	274	Tanker	Gibraltar	UUE
BSL Piraeus	208	Cargo	Algeciras/Drift	UUE
Argentina	292	Cargo	Gibraltar	RAM[8]

Table 4: AIS information being transmitted by 11 vessels waiting to enter Algeciras or Gibraltar at the time of the accident

[5] Channels 9, 10 and 13 were reserved for future use and channel 14 was allocated for search and rescue systems.

[6] Underway using engine

[7] Not under command

[8] Restricted in ability to manoeuvre

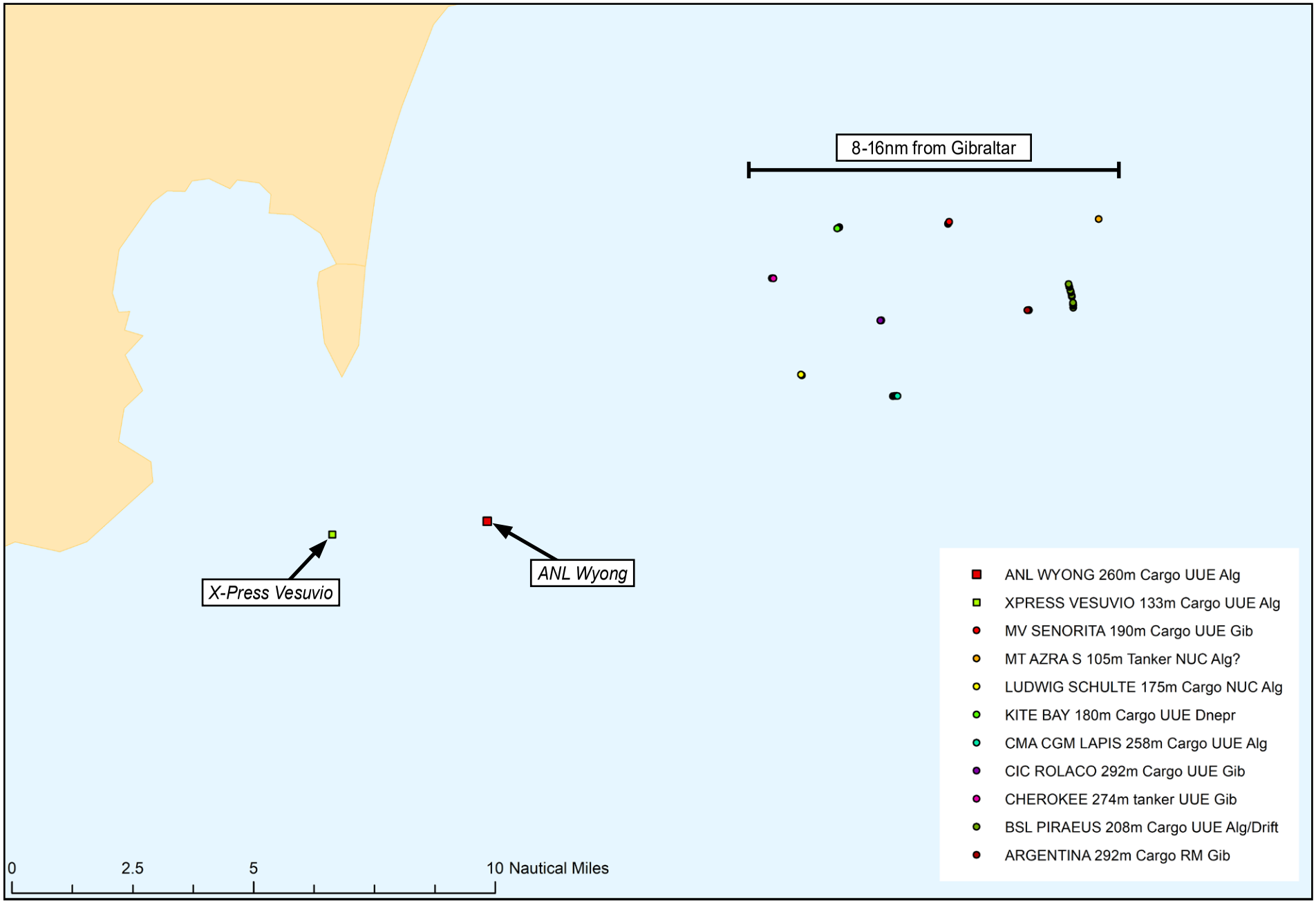

Figure 15: AIS data for 11 vessels waiting outside Gibraltar Bay at the time of the accident

1.7 USE OF AIS AND VHF RADIO FOR COLLISION AVOIDANCE

The Bridge Procedures Guide (Fifth Edition) published by the International Chamber of Shipping (ICS) stated that '*radar and ARPA are the primary electronic anti-collision aids for the OOW. Due to the risk of confusion and error, VHF radio and AIS should not be relied upon for collision avoidance'.*

UK guidance for watchkeepers on the use of VHF radio and AIS was contained in the Maritime and Coastguard Agency's (MCA) Marine Guidance Note (MGN) 324 (M+F) Amendment 1 *Navigation: Watchkeeping Safety – use of VHF Radio and AIS*. This MGN stated that:

'3. Use of VHF to Aid Collision Avoidance

3.1. There have been a significant number of collisions where subsequent investigations have found that at some stage before impact, one or both parties were using VHF radio in an attempt to avoid collision. The use of VHF radio in these circumstances is not always helpful and may even prove to be dangerous.

3.2. At night, in restricted visibility or when there are more than two vessels in the vicinity, the need for positive identification is essential but this can rarely be guaranteed. Uncertainties can arise over the identification of vessels, correlation and interpretation of messages received. Even where positive identification has been achieved there is still the possibility of a misunderstanding due to language difficulties however fluent the parties concerned might be in the language being used. An imprecise or ambiguously expressed message could have serious consequences.

3.3. Valuable time can be wasted whilst mariners on vessels approaching each other try to make contact on VHF radio instead of complying with the COLREG. There is the further danger that even if contact and identification are achieved and no difficulties over the language of communication or message content arise, a course of action might still be chosen that does not comply with the COLREG. This may lead to the collision it was intended to prevent.

5. Use of AIS to Support Safe Navigation

5.3.a) collision avoidance must be carried out in strict compliance with the COLREG. There is no provision in the COLREG for use of AIS information, therefore, decisions should be taken based primarily on systematic visual and/ or radar observations. The availability and display of AIS data similar to one produced by systematic radar target-tracking (e.g. ARPA) should not be given priority over the latter. AIS target data will only be based on the target vessels' course and speed over ground whilst for COLREG compliance such data must be based on the vessels' course and speed through the water

5.3.c) The use of VHF to discuss actions to take between approaching ships is fraught with danger and still discouraged. MCA's view is that identification of a target by AIS does not completely alleviate the danger. Decisions on collision avoidance should be made strictly according to the COLREG.'

1.8 VESSEL TRAFFIC SERVICES

Regulation 12 of Chapter V of the IMO's Safety of Life at Sea (SOLAS) Regulations stated that *'vessel traffic services (VTS) contribute to the safety of life at sea, safety and efficiency of navigation and protection of the marine environment, adjacent shore areas, work sites and offshore installations from possible adverse effects of maritime traffic'*. IMO guidelines and criteria for competent authorities providing a VTS were promulgated in IMO Resolution A.857(20). This included guidance on the responsibilities of VTS providers and the elements required of a VTS system.

Guidance for VTS competent authorities was provided by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA). IALA Document 1089 explained the three levels of VTS services:

- An **information** VTS maintained *'a traffic image and allows interaction with traffic and response to developing traffic situations. An Information Service should provide essential and timely information to assist the on board decision-making process.'*

- A **traffic organisation** VTS was *'to prevent the development of dangerous maritime traffic situations and to provide for the safe and efficient movement of vessel traffic within the declared VTS area. It concerns the operational management of traffic and the planning of vessel movements and is particularly relevant in times of high traffic density or when vessel movements may affect the traffic flow.'*

- A **navigational assistance** VTS *'provides essential and timely navigational information to assist in the on board navigational decision-making...and is especially important in difficult navigational or meteorological circumstances. A Navigational Assistance Service is an important supplement to the provision of other navigational services, such as pilotage.'*

The IALA guidance stated that a traffic organisation service should be provided where there was a need to plan and prioritise vessel movements to prevent congestion or dangerous situations. Examples given were where mandatory reporting has been established or special routes need to be followed.

1.9 SHIP REPORTING SYSTEMS

The aim of a ship reporting system was to enhance safety of life at sea, safe navigation and environmental protection by monitoring shipping traffic in designated areas of potential risk. Mandatory reporting systems were designated by the IMO and vessels were obligated to comply with the reporting requirement as set out in SOLAS Section V, Regulation 11.

The Strait of Gibraltar was a mandatory ship reporting system as promulgated in IMO Circular SN.1/Circ.287 dated 2 June 2010, *Mandatory Ship Reporting Systems*. The Strait of Gibraltar Reporting System (GIBREP) covered the area between longitudes 005°58'.00W and 005°15'.00W; the system was divided into sectors **(Figure 16)**, managed by Tarifa Traffic VTS and Tangier Traffic VTS. All vessels over 300gt were mandated to submit reports by VHF radio. For westbound traffic, the report was made to Tarifa Traffic VTS on VHF channel 10 when entering the reporting area.

1.10 REGIONAL MARITIME SAFETY AUTHORITIES

1.10.1 Vicinity of the collision

The Strait of Gibraltar and the ports of Algeciras and Gibraltar form an extremely busy area of shipping traffic. Over 71,000 vessels pass through the Strait of Gibraltar and there are over 30,000 ship movements through the port of Algeciras annually.

1.10.2 Tarifa Traffic

Tarifa Traffic provided an information level VTS and was responsible for the west bound traffic sector of the mandatory reporting scheme **(Figure 16)**. Tarifa Traffic was equipped with radar and AIS for surveillance, communications equipment in multiple bands, VHF radio direction finding and digital selective calling (DSC). Trained operators provided continuous coverage monitoring the allocated sector using a Kongsberg coastal surveillance VTS computer system. The surveillance system had an automatic collision alarm, but this was not routinely in use due to false alarms caused by the persistently high density of traffic. The focus of Tarifa Traffic VTS operators was vessels passing through the TSS.

1.10.3 Algeciras Bay Port Authority

The Algeciras Bay Port Authority was a Spanish government organisation and part of the Ministry of Development. The harbourmaster in Algeciras was responsible for marine safety, search and rescue, environmental protection and was the competent authority for the provision of an information level VTS (Algeciras VTS) in Gibraltar Bay between Punta Carnero and Europa Point **(Figure 16)**. The harbour authority maintained continuous surveillance of its area of responsibility from a VTS centre overlooking the bay; the centre was equipped with radar and AIS for monitoring traffic and VHF radio for communications.

The harbourmaster had previously identified the risk of collision associated with vessels waiting to enter Algeciras and, in 2016, had developed a proposal **(Annex A)** to create a dedicated anchorage/holding area east of Gibraltar for waiting traffic. However, this proposal was not implemented due to local objections.

1.10.4 Port of Algeciras Pilots' Corporation

A pilotage service for vessels entering or leaving Algeciras was provided by Algeciras Pilots. Algeciras Pilots was an independent organisation, but worked in co-operation with Algeciras VTS and the commercial port to manage vessel movements and optimise utilisation of berthing facilities. Vessels approaching Algeciras were required to call the pilot station on VHF radio channel 13 to be notified of the intended pilot boarding location and time.

1.10.5 Gibraltar Port Authority

The Gibraltar Port Authority (GPA) provided all port operations and safety services, including the provision of a navigational assistance level VTS, for vessels operating in the vicinity of Gibraltar **(Figure 16)**.

Reproduced from Admiralty Chart 0142 by permission of HMSO and the UK Hydrographic Office

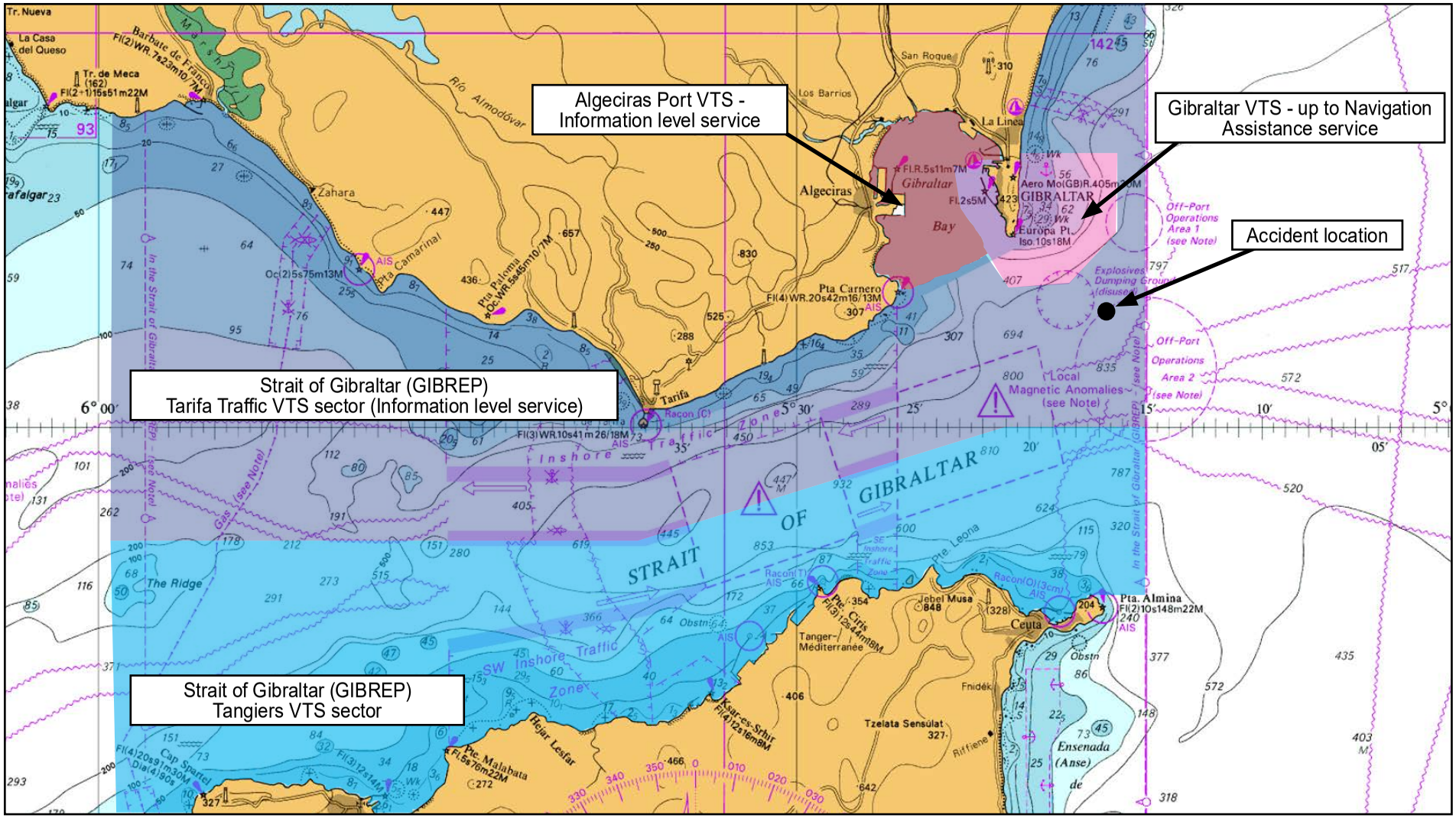

Figure 16: Overview of VTS sectors

1.11 COLLISION REGULATIONS

In accordance with the IRPCS, all vessels were required to maintain a proper and effective lookout, proceed at a safe speed, assess the situation and, where risk of collision exists, take action to avoid collision by passing at a safe distance.

A safe speed is one where a vessel can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions. Visibility and traffic density are among the factors to be taken into account when assessing a safe speed.

Action taken to avoid a collision should result in passing at a safe distance. This regulation applies in all conditions of visibility. With sufficient sea room, an alteration of course alone may be sufficient; if not, vessels should slow down or stop if necessary.

Collision avoidance in restricted visibility was governed by IRPCS Rule 19, which stated that:

> *a. This Rule applies to vessels not in sight of one another when navigating in or near an area of restricted visibility.*
>
> *b. Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility. A power-driven vessel shall have engines ready for immediate manoeuvre.*
>
> *c. Every vessel shall have due regard to the prevailing circumstances and conditions of restricted visibility when complying with the Rules of section 1 of their port.*
>
> *d. A vessel which detects by radar alone the presence of another vessel shall determine if a close-quarters situation is developing and/or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when such action consists of an alteration of course, so far as possible the following shall be avoided:*
>
> > *i. an alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken;*
> >
> > *ii. an alteration of course towards a vessel abeam or abaft the beam.*
>
> *e. Except where it has been determined that a risk of collision does not exist, every vessel which hears apparently forward of her beam the fog signal of another vessel, or which cannot avoid a close quarters situation with another vessel forward of her beam, shall reduce her speed to the minimum at which she can be kept on her course. She shall if necessary take all her way off and in any event navigate with extreme caution until danger of collision is over.*

An extract of the IRPCS relevant to this collision is at **Annex B**.

1.12 PREVIOUS SIMILAR ACCIDENT

1.12.1 Collision between *Celsius Mumbai* and *Wisby Argan*

On 11 October 2014 the Marshall Islands registered chemical carrier *Celsius Mumbai* and the Norwegian registered chemical carrier *Wisby Argan* collided in Gibraltar Bay within the Algeciras VTS area. *Celsius Mumbai* was heading towards the berth that *Wisby Argan* had just departed from. This accident was investigated by the Spanish Marine Accident Investigation Commission. The key conclusion was that, despite the provision of trained personnel and suitable equipment for vessel traffic monitoring, the risk of collision went undetected ashore until it was too late.

The investigation report also highlighted the lack of coordination between the different agencies involved in safety of shipping in the area. The report stated that there had been an average of 24 recorded incidents and accidents in the Bay of Algeciras since 2005. It also identified that, in 2010, an investigation report into the collision between *Ciudad de Ceuta* and *Ciudad de Tánger* had recommended that either a TSS or cautionary area for vessels approaching Algeciras be established.

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 OVERVIEW

ANL Wyong and *King Arthur* collided in thick fog, darkness and in an area of heavy shipping traffic. *ANL Wyong* was stopped in the water having been given direction by Algeciras Pilots to wait outside Gibraltar Bay. *King Arthur* was making way towards a boat transfer position outside Algeciras harbour.

This section of the report will discuss the circumstances of the accident and explain why neither vessel took sufficient action to avoid the collision and pass at a safe distance. The causal factors include onboard decision making, application of the IRPCS, the use of VHF radio and AIS information, and the involvement of shore authorities with responsibility for the safety of shipping in the area. It will also discuss why neither vessel received a communication from VTS warning them of the impending danger of collision.

2.3 THE COLLISION

2.3.1 *ANL Wyong*

Having been instructed to wait at least 3nm from the Bay entrance and aware that the vessel was likely to be called forward at short notice, *ANL Wyong*'s master made the decision to stop his vessel and wait outside Gibraltar Bay. The master's decision was underpinned by the limited number of contacts showing on radar **(Figure 3)** when he left the bridge.

From about 20 minutes prior to the collision, the traffic density started to increase with numerous vessels heading towards *ANL Wyong* **(Figures 7** and **8)** and a serious risk of collision evident **(Figure 9)**. *ANL Wyong*'s OOW was keeping an effective lookout and aware of the developing situation but did not act to avoid collision; the master was not called, and the engine remained stopped. This lack of action happened because the OOW perceived was that the approaching vessels would keep clear. *ANL Wyong* was stopped in the water, the upper deck lighting was on and it was waiting to be called to the pilot station; in this situation, the OOW had no sense of an obligation to take avoiding action.

Given his inexperience and the absence of the master on the bridge, the developing dangerous shipping situation would have been stressful for the OOW. Preferring inaction to action (or 'decision avoidance') can reduce stress in such situations.

The master's night orders required the OOW to call the master if in any doubt **(Figure 13)**. However, it is highly likely that this did not happen because the OOW would have been reluctant to interrupt the master's rest through a well-meaning but misplaced desire to demonstrate his competence on the bridge. It is also possible

that observation of another vessel in a similar situation, specifically *Xpress Vesuvio* **(Figure 15)**, might have acted as a reinforcing bias, suggesting to the OOW that his actions were appropriate.

2.3.2 *King Arthur*

When *King Arthur*'s master analysed *ANL Wyong*, he assessed, from AIS data, that it was heading in a south-westerly direction **(Figure 17)** and was underway using its engine. Soon after, he became aware of the presence of *Spread Eagle* heading towards and expected to pass on the port side. Given this assessment, the master decided to alter course to starboard to increase the CPA on both these vessels and to avoid passing ahead of *ANL Wyong*. Had the master maintained his heading, *ANL Wyong* would have passed close to starboard [Section 1.2.1]; however, this alteration of course created a serious and immediate risk of collision. This happened primarily because, contrary to the master's assessment from AIS, *ANL Wyong* was actually stopped in the water and not making way on a south-westerly heading.

Figure 17: Detail from *King Arthur*'s starboard radar display showing the AIS symbol for *ANL Wyong* heading in a south-westerly direction

Although the chief officer had been with the company for some time, he was new to the role, and the master was highly experienced and well regarded. As a result, there was a risk of a 'power gradient' between the two officers that would create an environment where the chief officer might hesitate to challenge the master's decisions. Prior to the master's alteration of course to avoid *ANL Wyong*, the chief officer had noted its pending close CPA to starboard. However, the chief officer was

distracted by the constant VHF radio conversations as he did not challenge the master's actions or pass on this critical information that was necessary for collision avoidance decisions.

By taking the con himself, the master became embroiled in manoeuvring for collision avoidance, which reduced his area of focus to nearby shipping. For his part, the chief officer was occupied with VHF conversations. Neither officer had the capacity to maintain an awareness of the overall situation. Had they done so, it might have been evident that slowing *King Arthur* to let the cluster of vessels around them draw ahead would have been an appropriate course of action, which also would have reduced the rate at which they were encountering the eastbound traffic.

2.4 SAFE SPEED

A safe speed is one where a vessel can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions. Visibility and traffic density are among the factors to be taken into account when assessing a safe speed **(Annex B)**.

The decision to stop *ANL Wyong* close to the pilot station made sense to the master at the time as the traffic situation was light **(Figure 3)** and it was likely that the vessel was going to be required to enter Algeciras at short notice. However, remaining stopped when multiple contacts were approaching resulted in a situation where the OOW had no options available to take avoiding action. Irrespective of the poor visibility, there was no realistic prospect of the vessels that were approaching *ANL Wyong* slowing down or stopping. Therefore, a safer decision would have been to start making way to create options for taking avoiding action and exercising a higher degree of control of the situation. In this instance, being stopped in the water in dense fog and heavy shipping was, in effect, not proceeding at a safe speed and insufficient action was taken with *ANL Wyong*'s OOW entirely reliant on other vessels keeping clear.

King Arthur was proceeding at about 13kts, which was the speed required to arrive at the boat transfer position on time. In dense fog and heavy shipping, it would have been prudent of *King Arthur*'s master to significantly reduce speed in order to allow more time to assess the situation and avoid collision. At the time of the collision the average speed of the vessels making way in the area **(Figure 6)** was 9.5kts.

2.5 ACTION TAKEN TO AVOID COLLISION

Action taken to avoid a collision should result in passing at a safe distance. This regulation applies in all conditions of visibility. With sufficient sea room, an alteration of course alone may be sufficient; if not, vessels should slow down or stop if necessary **(Annex B)**. As *King Arthur* approached *ANL Wyong,* the bridge team was managing a multiple shipping situation with little sea room to manoeuvre for collision avoidance, therefore slowing down would have been prudent. Nevertheless, the master pressed ahead when the calculated CPA with *ANL Wyong* was 0.3nm to starboard. In fog and darkness, this CPA was too close and did not allow sufficient margin for error. The situation was compounded by the master's appreciation and, when he altered course to starboard intending to increase the CPA with *ANL Wyong*, there was no time left to effectively manage the situation in order to pass at a safer distance.

Actions of vessels in restricted visibility are governed by Rule 19 of the IRPCS [Section 1.11]. This rule applies when another vessel is held by radar alone. However, the situational awareness and subsequent decision making on *King Arthur*'s bridge was derived from radar, AIS and VHF radio information. This resulted in *King Arthur*'s master making a series of course alterations based on his understanding from different sources of information as he tried to weave *King Arthur* past the slower vessels around him.

Although multiple sources of information can be used to assess the shipping situation, had *King Arthur*'s master adopted the more cautious approach required by Rule 19 of the IRPCS and, had it also been followed by all vessels in the area, the collision could have been avoided.

2.6 USE OF AIS AND ARPA

AIS data provides a significant enhancement for bridge teams' situational awareness particularly when integrated into radar and ECDIS systems. Nevertheless, received AIS data is whatever another vessel transmits, and is subject to potential errors. ARPA analysis of a radar target is based solely on the relative movement of own ship and the target providing an accurate presentation of another vessel's relative movement. Therefore, while the AIS data can enhance situational awareness, whenever there is a shipping situation that requires analysis to determine a risk of collision, the radar target and ARPA data should be used in preference to the received AIS track. UK guidance [Section 1.7] explains that there is no provision in the IRPCS for the use of AIS data and that collision avoidance decisions are based on systematic visual or radar observations.

The OOWs in both *ANL Wyong* and *King Arthur* had their radar displays set to prioritise AIS data when selecting targets for analysis **(Figures 8** and **9)**. This was not appropriate given the critical need to have accurate relative motion data to assess CPAs and the potential risk of collision.

Although the master's radar display on the port side of *King Arthur*'s bridge was reported as showing ARPA derived data in the target data section, there is no doubt that his decision to turn to starboard was heavily influenced by the AIS information. Specifically:

- *ANL Wyong*'s navigation status indicated that the vessel was underway using engines.
- The AIS symbol on the radar's plan display showed *ANL Wyong*'s orientation, thus inducing the master's attempt to avoid passing ahead of a vessel he perceived to be making way on a south-westerly heading **(Figure 17)**.
- *ANL Wyong*'s AIS symbol on the radar display showed a short pecked line representing the COG and SOG. This was derived from GPS data and was potentially misleading as this represented the movement over the ground.

Given that *King Arthur* was subject to the same environmental effects as *ANL Wyong*, the critical information is the relative movement through the water, which can only be accurately represented using the ARPA data.

The navigational status feature in AIS does not have a category to describe vessels that are underway but not making way. Although only a snapshot at the time of the accident, the 11 vessels waiting to enter Gibraltar or Algeciras at the time of the accident had variously selected: underway using engine, not under command and restricted in ability to manoeuvre. One vessel had used the word 'drift' in the voyage data field for next port of call **(Table 4)**. Given that there is an unallocated data field for navigational status [Section 1.6], consideration could be given to allocating this to a new category of 'underway not making way'.

2.7 USE OF VHF RADIO

Due to the risk of confusion and error, the use of VHF radio for collision avoidance is strongly discouraged. However, this accident illustrates that VHF radio conversations were held between several vessels in the build-up to the collision.

When *King Arthur*'s chief officer responded to the VHF radio call from *Spread Eagle*, it was not immediately apparent to him which vessel / radar contact was calling. When asked by *King Arthur*'s chief officer to clarify the situation by repeating the hailing vessel's name, *Spread Eagle* responded by describing itself as '*the vessel right ahead of you'*. At that moment, *Spread Eagle* was one of three vessels that could be described as 'ahead' of *King Arthur* **(Figure 18)**.

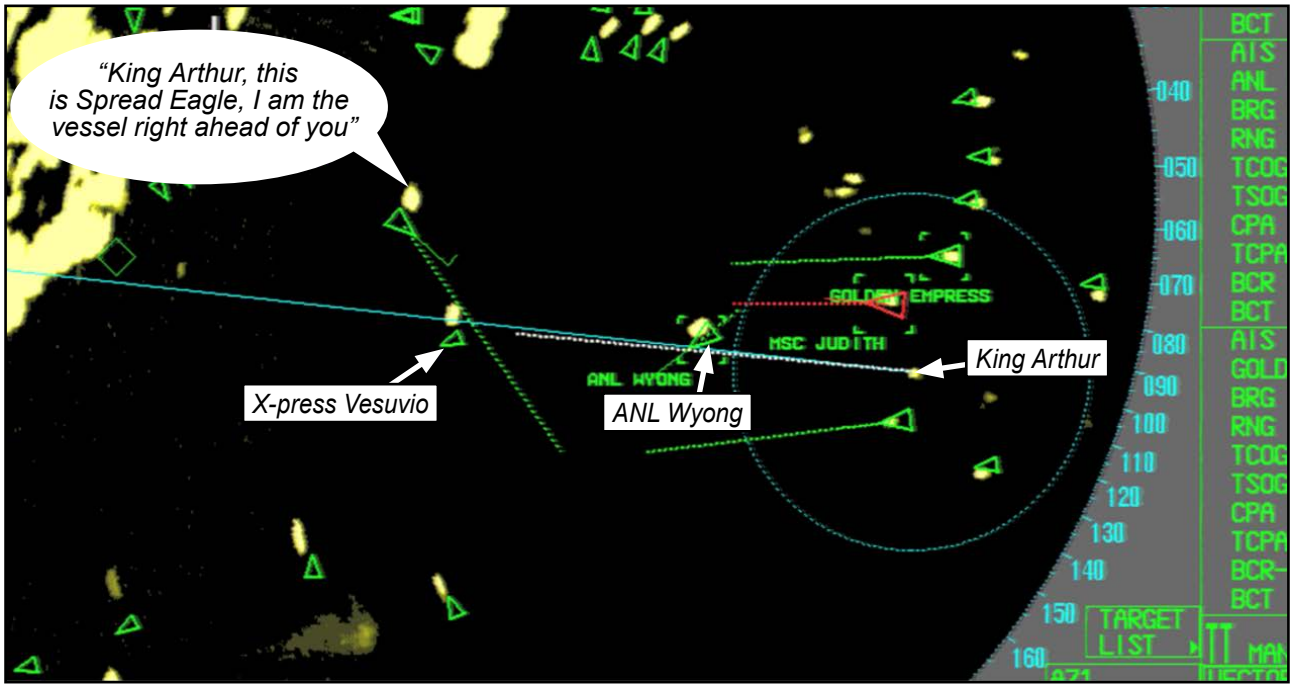

Figure 18: Detail of *King Arthur*'s radar when called by *Spread Eagle* showing that there were three vessels that could be assessed as 'ahead' of *King Arthur*

This VHF radio call was unnecessary as the IRPCS should have been followed to avoid collision but, equally significantly, it wasted time and was a distraction for *King Arthur*'s chief officer. This event happened only a few minutes before the collision, at a time when the chief officer's support to *King Arthur*'s master was critical. While the chief officer did not originate the VHF radio call with *Spread Eagle* and had no obligation to reply, it would have been unusual to ignore another vessel hailing on VHF radio.

This accident has illustrated that VHF radio was widely in use to aid collision avoidance in thick fog and an area of high traffic density; this was unhelpful and resulted in *King Arthur* not following the IRPCS; it was also a very significant distraction on *King Arthur*'s bridge at a critical moment.

2.8 VESSEL TRAFFIC SERVICES

The purpose of a VTS is to improve safety of life at sea, and a traffic organisation level of service should be provided when *'vessel movements need to be planned or prioritised to prevent congestion or dangerous situations'*. The IALA guidance offers an example of where this level of service would be necessary as an area where mandatory reporting was established, which was the case where the accident happened.

The risk of collision near Algeciras had previously been identified by the harbourmaster [Section 1.10.3], who had proposed a plan to create a dedicated waiting anchorage to hold vessels away from the most congested area in the approach to Gibraltar Bay. However, this plan **(Annex A)** had not been implemented due to local objections. Nevertheless, it is apparent, from the vessels waiting at the time of the accident, that an area to the east of Gibraltar was routinely selected by vessels waiting to enter harbour **(Figure 15)**. This is a logical decision as this area was reasonably close to the pilot stations but away from the westbound traffic heading for the Strait. The report of the collision between *Celsius Mumbai* and *Wisby Argan* [Section 1.12.1] highlighted that a previous safety investigation had indicated that the provision of either a TSS or precautionary area for vessels approaching Algeciras could improve safety in the area. However, no such navigational systems had been introduced.

ANL Wyong and *King Arthur* were both bound for Algeciras and Algeciras Pilots had given the container vessel directions to wait outside the bay. This situation meant that both vessels were focused on approaching Algeciras as their short-term navigational plan. However, the collision occurred outside the Algeciras VTS area but inside Tarifa Traffic's sector. Understandably, Tarifa Traffic's focus was monitoring shipping using the Strait of Gibraltar TSS. Moreover, the anti-collision alarm feature in Tarifa Traffic's VTS system was not in use due to the density of traffic generating frequent false alarms. This meant that the busy shipping area in the approaches to Algeciras where this collision occurred was not being routinely monitored by either Tarifa Traffic or Algeciras VTS. This was because the vicinity of the accident was outside the Algeciras VTS sector and also outside the focus of Tarifa Traffic.

There was also no direct liaison or coordination between the shore authorities; different VHF radio frequencies were in use and different objectives were being met. Algeciras Pilots was focused on safely navigating vessels in and out of Algeciras and optimising the berths available in the commercial port. After short notice changes to pilotage plans, such as those affecting *ANL Wyong*, Algeciras Pilots would try to ensure that waiting vessels did not stray too far from the pilot station. Tarifa Traffic's focus was the shipping passing through the Strait, and Algeciras VTS's responsibility for safety, search and rescue and pollution control was restricted to the Gibraltar bay area.

Given that the risk of collision in this area had been previously identified and proposals suggested, the safety of shipping in this area would benefit from a review designed to enhance the coordination between the authorities involved to improve the deconfliction of traffic.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT THAT HAVE BEEN ADDRESSED OR RESULTED IN RECOMMENDATIONS

1. The accident happened because neither bridge team appreciated the risk of collision in sufficient time to take effective action to pass at a safe distance. [2.3.1, 2.3.2]

2. When the shipping situation deteriorated and a serious risk of collision developed, *ANL Wyong*'s OOW took no action to avoid collision. This was primarily because of his perception that other vessels would keep clear. [2.3.1]

3. *King Arthur*'s master perceived that *ANL Wyong* was making way in a south-westerly direction when the vessel was actually stopped in the water. This mis-perception was based on AIS information and resulted in the alteration of course to starboard, intended to pass astern of *ANL Wyong*, but that actually resulted in a serious risk of collision. [2.3.2]

4. By taking the con himself in a very busy shipping area, the focus of *King Arthur*'s master narrowed, reducing his ability to sustain full awareness of the situation. [2.3.2]

5. Neither vessel was proceeding at a safe speed for the prevailing circumstances and conditions. [2.4]

6. Neither vessel took sufficient action to avoid collision and pass at a safe distance. [2.5]

7. Use of AIS data for collision avoidance by both vessels risked misunderstandings and potentially inaccurate data on the relative movements of other vessels. [2.6]

8. The use of VHF radio for collision avoidance was an unhelpful distraction. In particular, the conversation with *Spread Eagle* wasted time and distracted *King Arthur*'s chief officer from his primary role of assisting the master with collision avoidance advice. [2.7]

9. Neither vessel received any warning from the shore agencies responsible for providing information intended to improve onboard navigational decision making. [2.8]

3.2 OTHER SAFETY ISSUES NOT DIRECTLY CONTRIBUTING TO THE ACCIDENT

1. On board *King Arthur*, the master's extensive experience and the chief officer being in his first contract, risked creating a 'power distance' between the officers that would make it difficult for the chief officer to challenge the master's decisions. [2.3.2]

2. It was unhelpful that the AIS navigational status data field did not have a descriptor for a vessel underway but not making way. [2.6]

3. Given that the risk of collision in the area of Gibraltar Bay had been previously identified and proposals suggested, the safety of shipping in the area would benefit from a review designed to enhance the coordination between the authorities involved to improve the deconfliction of traffic. [2.8]

SECTION 4 - ACTION TAKEN

4.1 ACTIONS TAKEN BY OTHER ORGANISATIONS

CMA CGM International Shipping Company Pte. Ltd has:

- Conducted an internal audit of *ANL Wyong*.
- Conducted a company safety investigation that identified the causes and circumstances of the accident.
- Issued a ‘Lessons Learned’ fleet circular to all the vessels in its fleet highlighting the issues raised by the accident, specifically the requirement to:
    - exercise extreme caution when navigating in restricted visibility;
    - proceed at a safe speed in restricted visibility;
    - call the master without hesitation and take action to avoid collision; and,
    - always be ready for immediate manoeuvring.

Mediterranea di Navigazione S.p.A has:

- Conducted an internal audit of *King Arthur*. This included an onboard education programme by the company staff to review the safety issues identified.
- Conducted an internal safety investigation that identified the causes and circumstances of the accident.
- Updated the company SMS to include further guidance on safe speed and conduct of navigation in restricted visibility.
- Issued a safety article for all vessels highlighting the safety lessons from the accident.
- Provided additional bridge team management training from crew members involved in the accident.

SECTION 5 - RECOMMENDATIONS

The **Spanish Ministry of Development** is recommended to:

2020/115 Conduct a review of vessel traffic services in the vicinity of Algeciras designed to enhance the coordination between the authorities involved in order to improve the deconfliction of traffic. Such a review should consider establishing:

- a dedicated holding area or anchorage for waiting vessels, and;
- a traffic organisation service for vessels in the approaches to Algeciras.

The **Maritime and Coastguard Agency** is recommended to:

2020/116 Propose to the International Maritime Organization that the navigation status information in the automatic identification system be reviewed to ensure that a vessel's status can be accurately described, including vessels underway but not making way.

Safety recommendations shall in no case create a presumption of blame or liability

Marine Accident Report