ACCIDENT REPORT

Red Ensign Group

Isle of Man Ship Registry
A Member of the Red Ensign Group

Report on the investigation of

the collision between the bulk carrier

Polesie

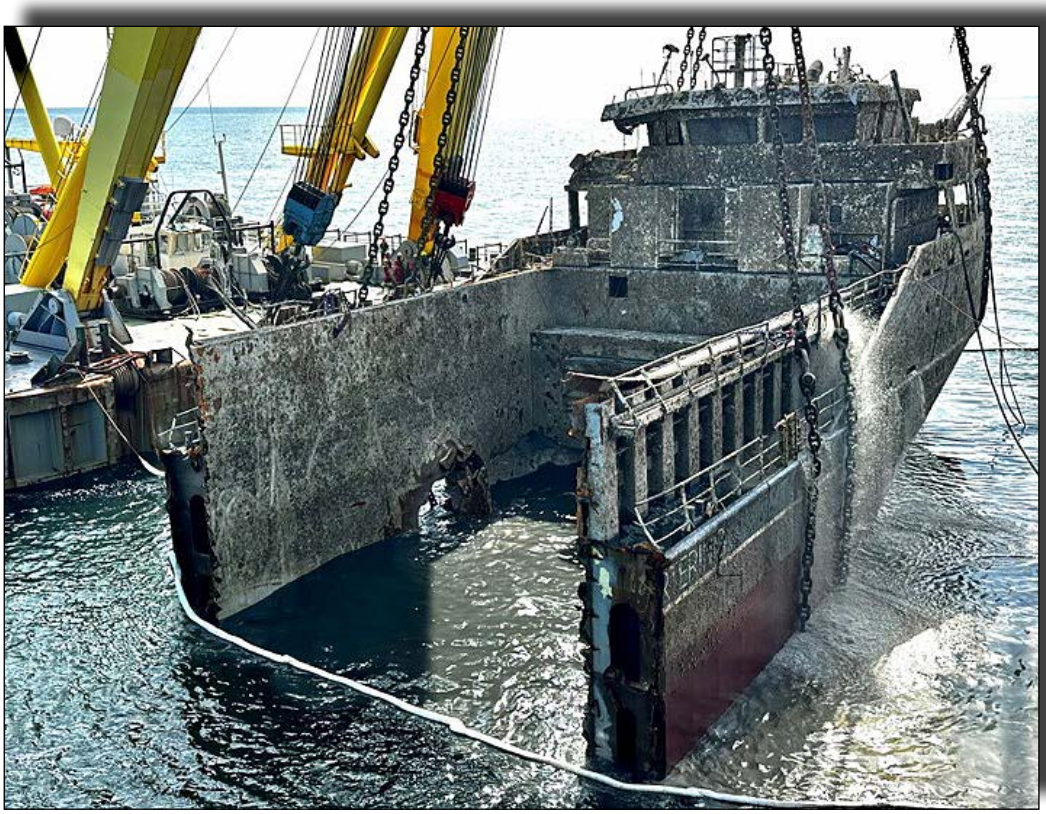
and the general cargo ship

Verity

resulting in the sinking of *Verity* with five fatalities

in the German Bight traffic separation scheme

on 24 October 2023



VERY SERIOUS MARINE CASUALTY REPORT NO 5/2026 FEBRUARY 2026

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

This investigation was carried out by the UK Marine Accident Investigation Branch (MAIB) on behalf of the Isle of Man Administration in accordance with the Memorandum of Understanding between the MAIB and the Red Ensign Group Category 1 registries of Isle of Man, Cayman Islands, Bermuda and Gibraltar.

Extract from

The Isle of Man Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2001 – Regulation 4:

The fundamental purpose of investigating a casualty, an accident, or an incident under these Regulations is to determine its circumstances and the causes with the aim of improving the safety of life at sea and the avoidance of accidents in the future. It is not the purpose to apportion liability, nor, except so far as is necessary to achieve the fundamental purpose, to apportion blame.

NOTE

Under Section 4 of the Isle of Man Merchant Shipping Act 1985 a person is required to answer an Inspector's questions truthfully. If the contents of this report were subsequently submitted as evidence in court proceedings then this would contradict the principle that a person cannot be required to give evidence against themselves. Therefore, the Isle of Man Ship Registry makes this report available to interested parties on the understanding that it 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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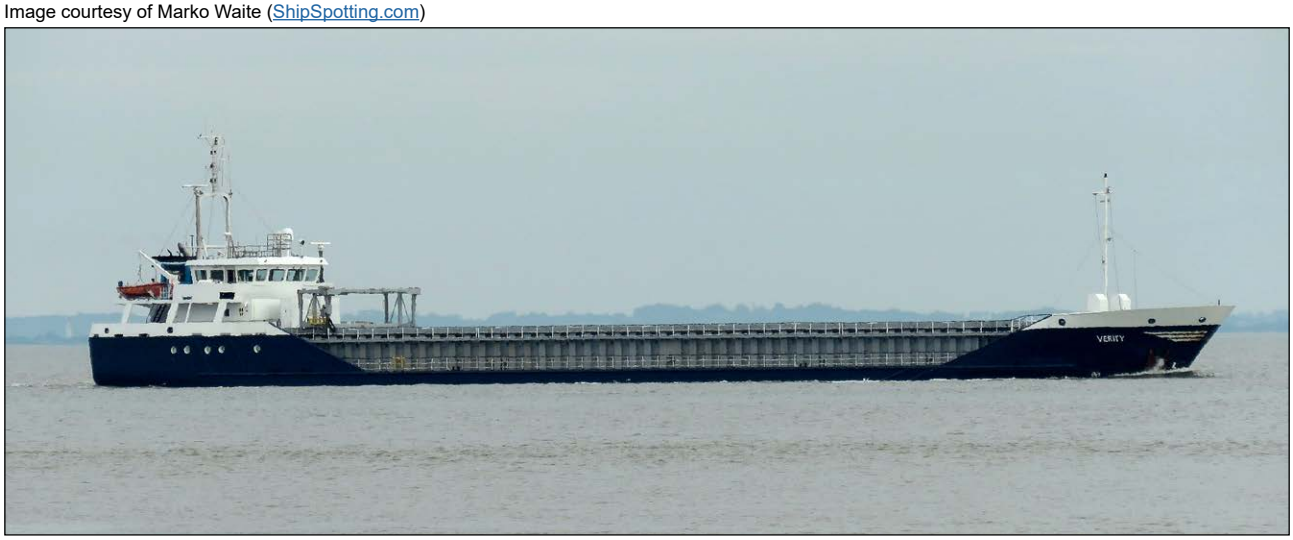
Image courtesy of Martin Klingsick (ShipSpotting.com)

Image courtesy of Marko Waite (ShipSpotting.com)



Polesie and *Verity*

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

°C	-	degrees Celsius
2/O	-	second officer
AB	-	able seaman
AIS	-	automatic identification system
ARPA	-	automatic radar plotting aid
BCR	-	bow crossing range
BMA	-	The Bahamas Maritime Authority
BNWAS	-	Bridge Navigational Watch Alarm System
BPG	-	Bridge Procedures Guide
BSU	-	Federal Bureau of Maritime Casualty Investigation
C	-	(time of) collision
C/O	-	chief officer
CoC	-	Certificate of Competency
COLREGs	-	see IRPCS
CPA	-	closest point of approach
DWT	-	deadweight tonnage
ECDIS	-	Electronic Chart Display and Information System
EPIRB	-	emergency position indicating radio beacon
GDWS	-	Directorate General for Waterways and Shipping (Germany)
GHz	-	gigahertz
GPS	-	global positioning system
gt	-	gross tonnage
IALA	-	International Association of Marine Aids to Navigation and Lighthouse Authorities
IMO	-	International Maritime Organization
IRPCS	-	International Regulations for Preventing Collisions at Sea, 1972, as amended (also referred to as the COLREGs)
kW	-	kilowatt
kts	-	knots
m	-	metres
m^3	-	cubic metres

MAIB	-	Marine Accident Investigation Branch
MCA	-	Maritime and Coastguard Agency
MERAC	-	Maritime Emergency Reporting and Assessment Centre
MGN	-	Marine Guidance Note
mm	-	millimetre
nm	-	nautical miles
OOW	-	officer of the watch
Polsteam	-	Polska Żegluga Morska P.P.
PTT	-	press-to-talk
SAR	-	search and rescue
SART	-	search and rescue transponder
SMCP	-	standard marine communication phrases
SMS	-	safety management system
SOLAS	-	International Convention for the Safety of Life at Sea, 1974, as amended
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW Convention)
t	-	tonnes
TCPA	-	time to closest point of approach
TSS	-	traffic separation scheme
UK	-	United Kingdom
UTC	-	universal time coordinated
VDR	-	voyage data recorder
VHF	-	very high frequency
VTS	-	vessel traffic services

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

SYNOPSIS

At 0455 on 24 October 2023, the Isle of Man registered general cargo ship *Verity* and the Bahamas registered bulk carrier *Polesie* collided in the German Bight traffic separation scheme. *Verity* sank quickly and five of the seven crew lost their lives. Before the collision, *Polesie* was heading westbound in the traffic separation scheme and *Verity* was heading northbound such that a risk of collsion existed. *Verity* was required by the International Regulations for Preventing Collisions at Sea (IRPCS), 1972, as amended, to keep clear of *Polesie*.

Analysis of the application of the IRPCS by *Verity*'s and *Polesie*'s watchkeepers indicated significant shortcomings. Specifically, both watchkeepers were willing to accept inappropriately close passing distances given that their room for manoeuvre was not overly constrained by navigational hazards or limited by other traffic. The early use of very high frequency radio could have avoided ambiguity as to each vessel's actions. When actions were eventually taken to avoid a collision, they were neither positive, so as to be readily apparent to other observers, nor made in ample time. However, the investigation found nothing to indicate the need to review the current IRPCS.

Analysis of the actions of the German Bight vessel traffic services identified that its initial intervention was relatively late; its communications did not include standard marine communication phrases, which might have helped alert the watchkeepers to the seriousness of the situation, and the use of a duplex radio channel hampered the passing of crucial information. The second intervention was made when the vessels were so close that external intervention was counterproductive. However, the instruction was sufficiently forceful to cause *Polesie*'s officer of the watch to comply.

Verity sank quickly so the crew had no time to don lifejackets or immersion suits. This limited their survival time and made their detection difficult in the prevailing sea conditions. Nonetheless, the emergency response was swift and appropriate. The investigation was limited because *Verity* was not fitted with a voyage data recorder and key witnesses did not survive. Restrictions on interviewing key witnesses limited the investigation's ability to explore the rationale behind the actions taken by *Polesie*'s watchkeeper and the decisions and actions taken by the staff at German Bight vessel traffic services.

The International Organization for Marine Aids to Navigation has updated its guidelines on the use of duplex radio channels by vessel traffic services. Recommendations have been made to both shipping companies to remind their ships' crews to comply with the IRPCS and the standards for keeping a safe navigational watch. The German Directorate General for Waterways and Shipping has been recommended to review its use of duplex very high frequency radio channels and improve guidance to its personnel on the use of International Organization for Marine Aids to Navigation communication protocols and interacting with vessels in close range of each other. The Isle of Man Ship Registry has been recommended to propose to the International Maritime Organization extensions to the voyage data recorder carriage requirements.

SECTION 1 – FACTUAL INFORMATION

1.1 PARTICULARS OF *POLESIE* AND *VERITY* AND ACCIDENT

SHIP PARTICULARS		
Vessel's name	*Polesie*	*Verity*
Flag	Bahamas	Isle of Man
Classification society	Det Norske Veritas	Registro Italiano Navale
IMO number	9488097	9229178
Type	Bulk carrier	General cargo ship
Registered owner	Ares Nine Shipping Ltd	Casper Chartering Ltd
Manager(s)	Polska Żegluga Morska P.P.	Faversham Ships Ltd
Construction	Steel	Steel
Year of build	2009	2001
Length overall	189.99m	91.25m
Gross tonnage	24,055	2,601
Minimum safe manning	12	5
Authorised cargo	Solid bulk cargo	General cargo

VOYAGE PARTICULARS		
Port of departure	Hamburg, Germany	Bremen, Germany
Port of arrival	A Coruña, Spain	Immingham, England
Type of voyage	International	International
Cargo information	32,997t of feed barley and wheat	3,262t of steel coils
Manning	20	7
Draught	10m	5.4m

MARINE CASUALTY INFORMATION		
Date and time	24 October 2023 at 0455	
Type of marine casualty or incident	Very Serious Marine Casualty	
Location of incident	German Bight traffic separation scheme 54º01.5N 007º38.7E	
Place on board	Bow	Starboard side hull
Injuries/fatalities	None	5 fatalities
Damage/environmental impact	Minor damage to bow and starboard side hull	Vessel total loss. Minor oil pollution
Ship operation	On passage	On passage
Voyage segment	Transit	Transit
External & internal environment	Wind easterly/south-easterly force 6; cloudy with good visibility in intermittent rain; 1.5m swell; water and air temperature 13°C	
Persons on board	20	7

1.2 BACKGROUND

The investigation was conducted in accordance with the principles of the International Maritime Organization (IMO) Casualty Investigation Code. The UK Marine Accident Investigation Branch (MAIB) was the lead investigation body acting on behalf of the Isle of Man Ship Registry, the flag state for *Verity*. The MAIB received considerable support from the German Federal Bureau of Maritime Casualty Investigation (BSU) and The Bahamas Maritime Authority (BMA), which were both recognised as Substantially Interested States in the investigation.

The openness between investigators was not wholly reflected in the willingness of some stakeholders to co-operate with the immediate investigation. The key crew witnesses of *Polesie*, and the administrators of, and staff at, German Bight Traffic, could have provided critical evidence but were either unwilling or unable to, or prevented from expanding on their initial recollections, delivered in difficult circumstances, or providing other information to the investigators. In deciding on this policy, it is acknowledged that the individuals might have been following national legal advice.

Under German law, a witness is entitled to refuse to answer questions if those answers might incriminate them. It is not the aim of marine accident investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame, and while the output of individual interviews are protected from sharing with other entities under Isle of Man and Bahamas regulations, vessel traffic services (VTS) staff and administrators' interviews would have been conducted under German jurisdiction and the right to remain silent has been respected by accident investigation bodies. The missing subjective perspective of the VTS has, however, resulted in questions remaining regarding the processes within the organisation and decisions taken therein.

There are consequences when important witnesses decide not to give evidence: lessons that might otherwise bring about significant changes to safety regulations, ship design, ship manning, and other aspects of maritime safety are lost. Ultimately, it is the seafaring community that loses the potential improvements in future safety.

Polesie was fitted with a voyage data recorder (VDR), which provided the investigators with comprehensive data about the sequence of events on board. *Verity* was not required to be fitted with a VDR, its master and duty bridge watchkeeper did not survive, and there was no recoverable data from its on board equipment. The German authorities provided a limited VTS report that included selective voice recordings and computer display replays recovered from automatic identification system (AIS) and radar data.

Any inequities in this report are likely because investigators had inadequate, unreliable or incomplete information about the actions and intentions of some principal witnesses.

This report references UK case law to provide context and a broad understanding of what was, and was not, considered to be acceptable action when navigating a vessel in accordance with the IRPCS. Although case law, by necessity, results in a judgement that apportions blame, these judgements are not relevant to safety investigations and no blame or liability is intended by their use within this report.

1.3 NARRATIVE

1.3.1 Events leading to the collision

At 1940 on 23 October 2023, the Bahamas registered bulk carrier *Polesie* departed Hamburg, Germany bound for A Coruña, Spain loaded with a cargo of grain at a draught of 10m. The vessel had spent the last 7 days in port loading cargo after its arrival from Liverpool, England. On board were 20 crew and two pilots for the Elbe River.

At 2008 on the same day, the Isle of Man registered general cargo ship *Verity* sailed from Bremen, Germany bound for Immingham, England. It was loaded with 3,262 tonnes (t) of steel coils at a draught of 5.4m. The vessel had spent 5 days alongside loading cargo. On board were seven crew and a pilot for the Weser River.

At 0310 the following morning, *Polesie*'s pilots had disembarked, and the vessel began its sea passage **(Figure 1)**. On the bridge **(Figure 2)** were the master, second officer (2/O) and a helmsman. The vessel was steadied on a course of 273° towards its next waypoint at a speed of about 11 knots (kts)[1] with time in hand to reach its next port of call. The master handed control to the 2/O and shortly afterward left the bridge. The wind was easterly force 4 with a short steep swell from the same direction, partly cloudy with good visibility.

At about the same time, *Verity*'s pilot had disembarked, and the vessel's speed increased to about 8kts. The required speed to make the next port of call was being maintained. By 0348, *Verity* had reached the end of the main Jade/Weser navigation channel **(Figure 1)** and its course was set to 332° to transit the north-west bound lane of the German Bight traffic separation scheme (TSS). A VTS, call sign 'German Bight Traffic', controlled shipping transiting the area on duplex[2] very high frequency (VHF) radio channel 80[3].

By 0410, *Polesie*'s chief officer (C/O) had relieved the 2/O for the 0400 to 0800 watch. During the watch handover, they noted the position of a passenger ship, *Iona*, 1.3 nautical miles (nm) astern that had earlier been overtaken on *Polesie*'s port side. The radar at the navigation station in front of the starboard chair **(Figure 2)** was set on the 6nm range scale, offset. To the left of the radar display was an Electronic Chart Display and Information System (ECDIS) screen. The vessel had 8nm and 44 minutes to run to its next waypoint at the north-eastern entrance to the TSS for a planned alteration of course to 256°.

At about the same time, on the bridge of *Verity* **(Figure 3)** the 2/O handed over the watch to the C/O.

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[1] All speeds used are 'speed over the ground'.

[2] A channel whereby ships could hear VTS but not each other (see section 1.10).

[3] The whole area of the German Bight TSS within the German waters and Exclusive Economic Zone is controlled by two VTS assistants on VHF radio channels 79 and 80. Channel 79 is used for the western part of the surveillance area and channel 80 is used for the eastern part. The surveillance areas for North Coast Traffic and Jade Traffic are outside the TSS.

Chart courtesy of Bundesamt für Seeschifffart und Hydrographie, and UK Hydrographic Office

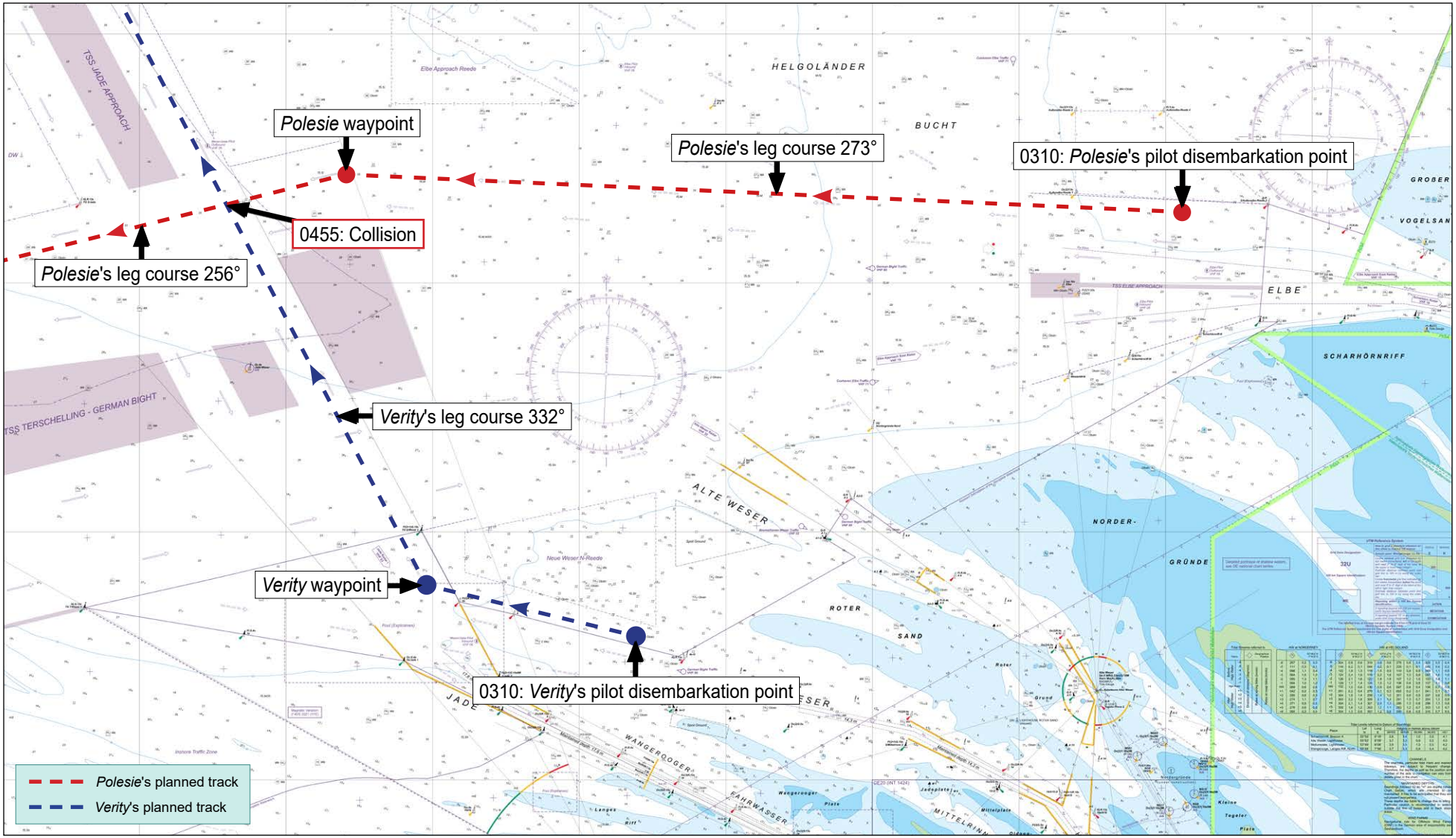


Figure 1: Admiralty Chart DE2 INT 1456 Approaches to rivers Jade, Weser and Elbe, showing the eastern part of the inner German Bight traffic separation scheme and planned tracks of *Polesie* (red) and *Verity* (blue)

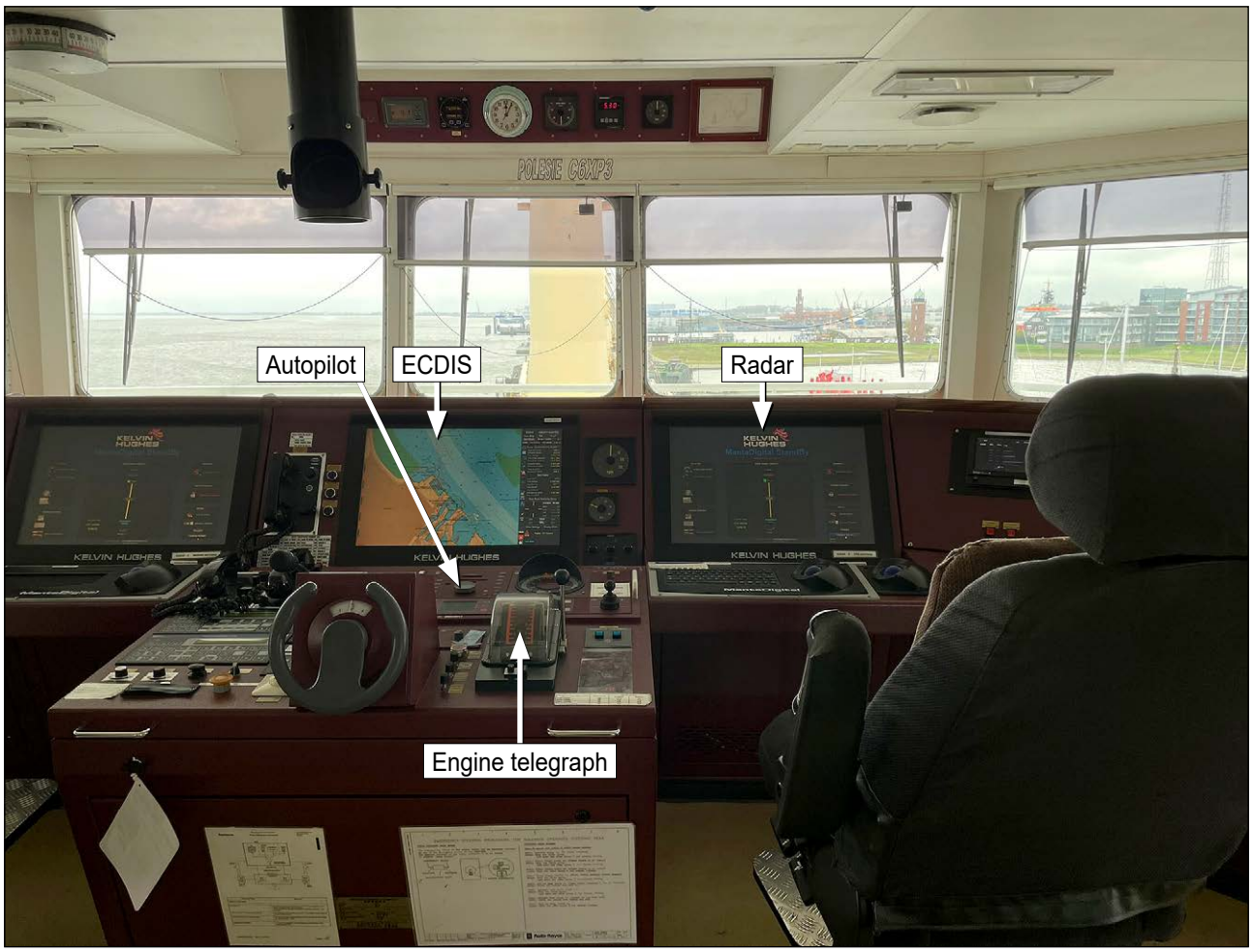


Figure 2: *Polesie*'s bridge console by starboard chair primary conning position

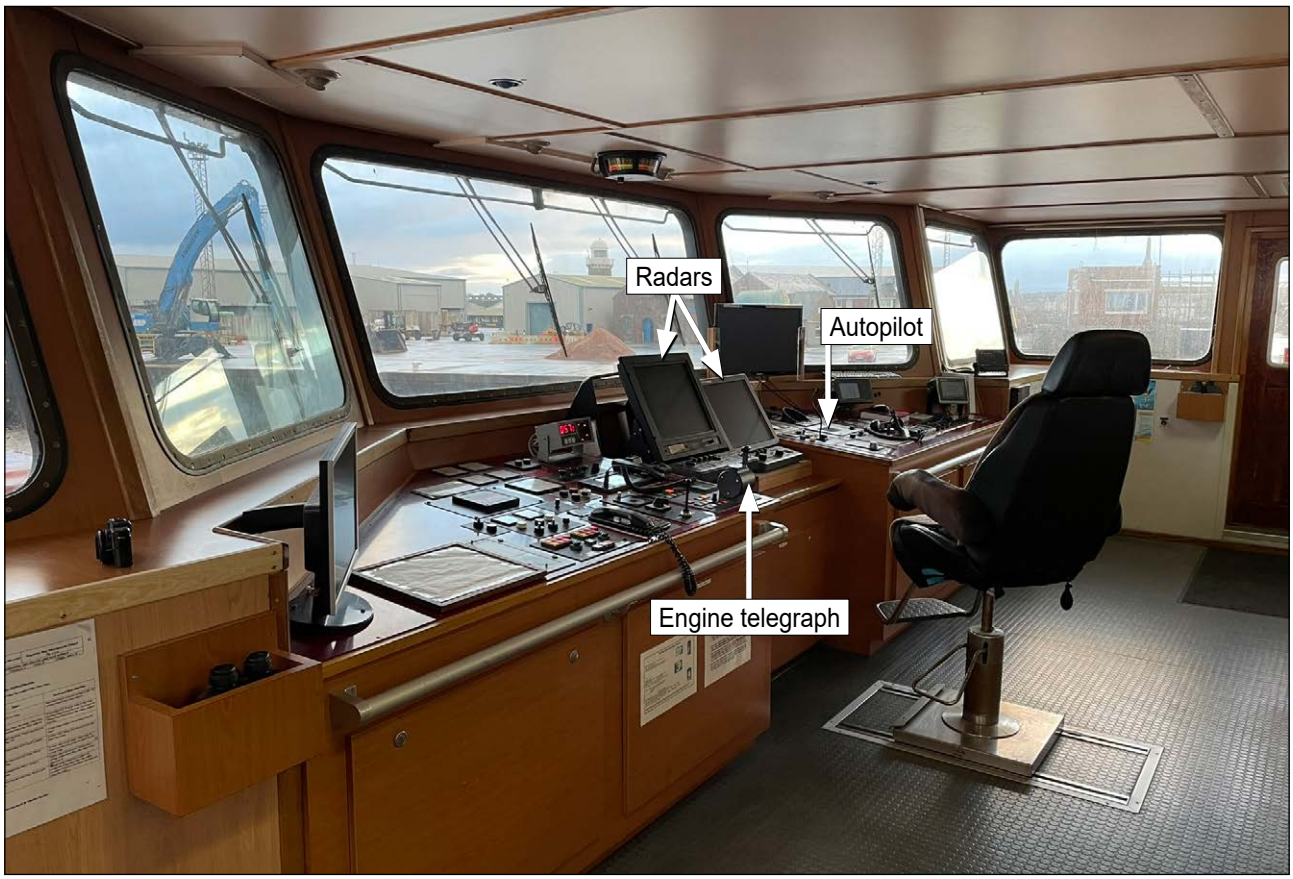


Figure 3: Similar bridge layout to *Verity*. Note: display screen equipment may differ, but primary control positions were the same

By 0410, a target had appeared on *Polesie*'s starboard radar (X-band, offset, 6nm range scale in use) with a corresponding AIS icon – a green triangle indicating the vessel was reporting information via AIS **(Figure 4)**. The AIS identified the radar contact as *Verity*, which was on a true[4] bearing of 226° at a range of 6.4nm, on a course of 332° at a speed of 8.1kts. *Verity*'s closest point of approach (CPA) was 0.15nm at a 'time to CPA' (TCPA) of 45 minutes. *Verity* had been marking on AIS and the S-Band radar, set to the 12nm range scale, since 0120 but was not tracked. No CPA alarms were in operation on either radar set.

At 0423, *Verity* entered the northbound section of the TSS heading 335° at 8.3kts, biased to the eastern side of the traffic lane. *Polesie* remained on a course of 273° at 11kts and had 3.8nm and 20 minutes to run to its next waypoint. *Polesie*'s AIS unit showed *Verity* on a nearly steady bearing of 226° with a CPA of 0.19nm and a TCPA of 36 minutes and 5 seconds.

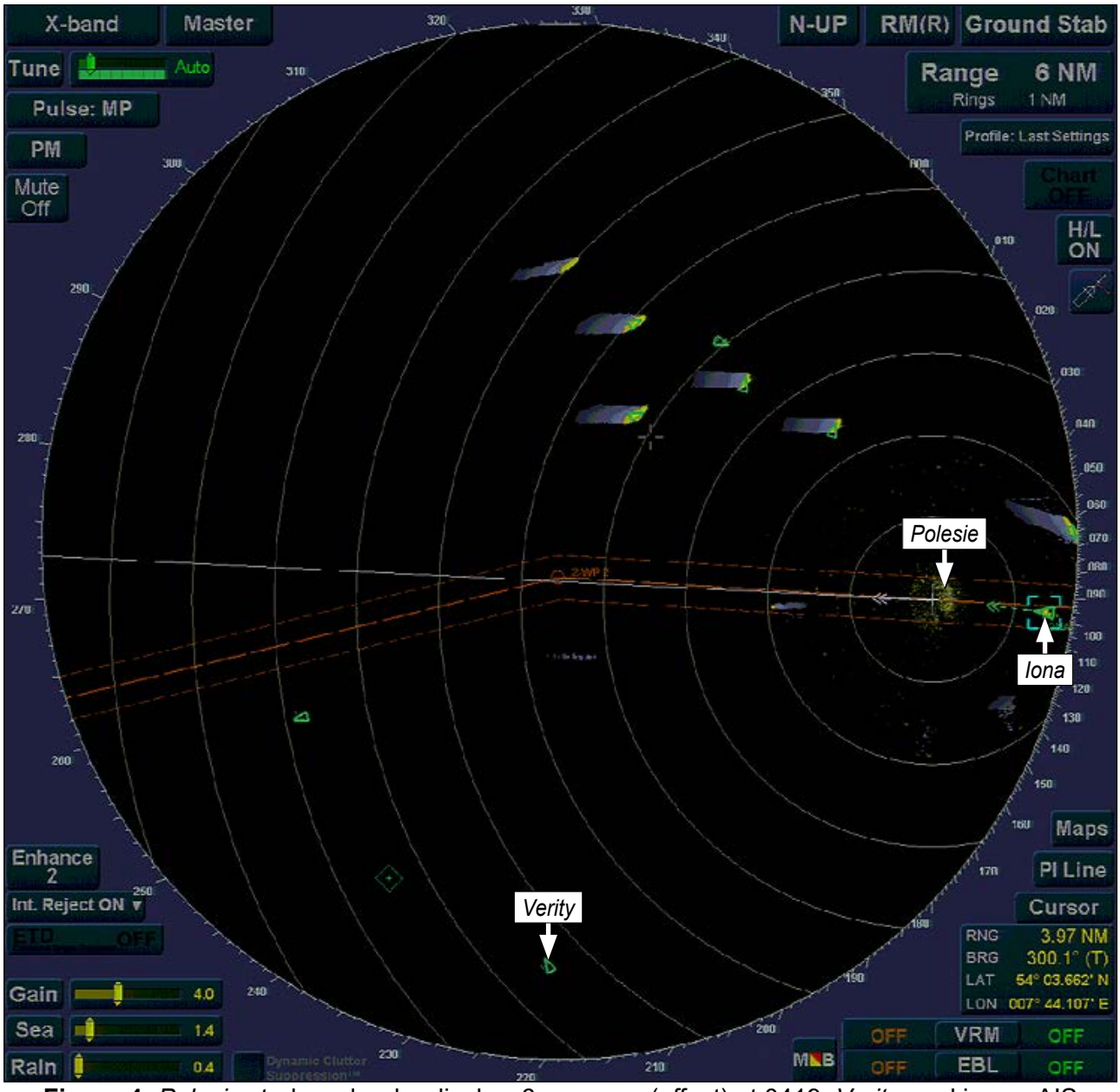


Figure 4: *Polesie* starboard radar display, 6nm range (offset) at 0419. *Verity* marking as AIS contact but not acquired by ARPA. 4.5nm to run to waypoint 2

[4] The angle measured clockwise from true north. All bearings quoted are 'true'.

At 0433, *Polesie*'s ECDIS recorded that *Verity* had passed from the German territorial sea into international waters **(Figure 5)**.

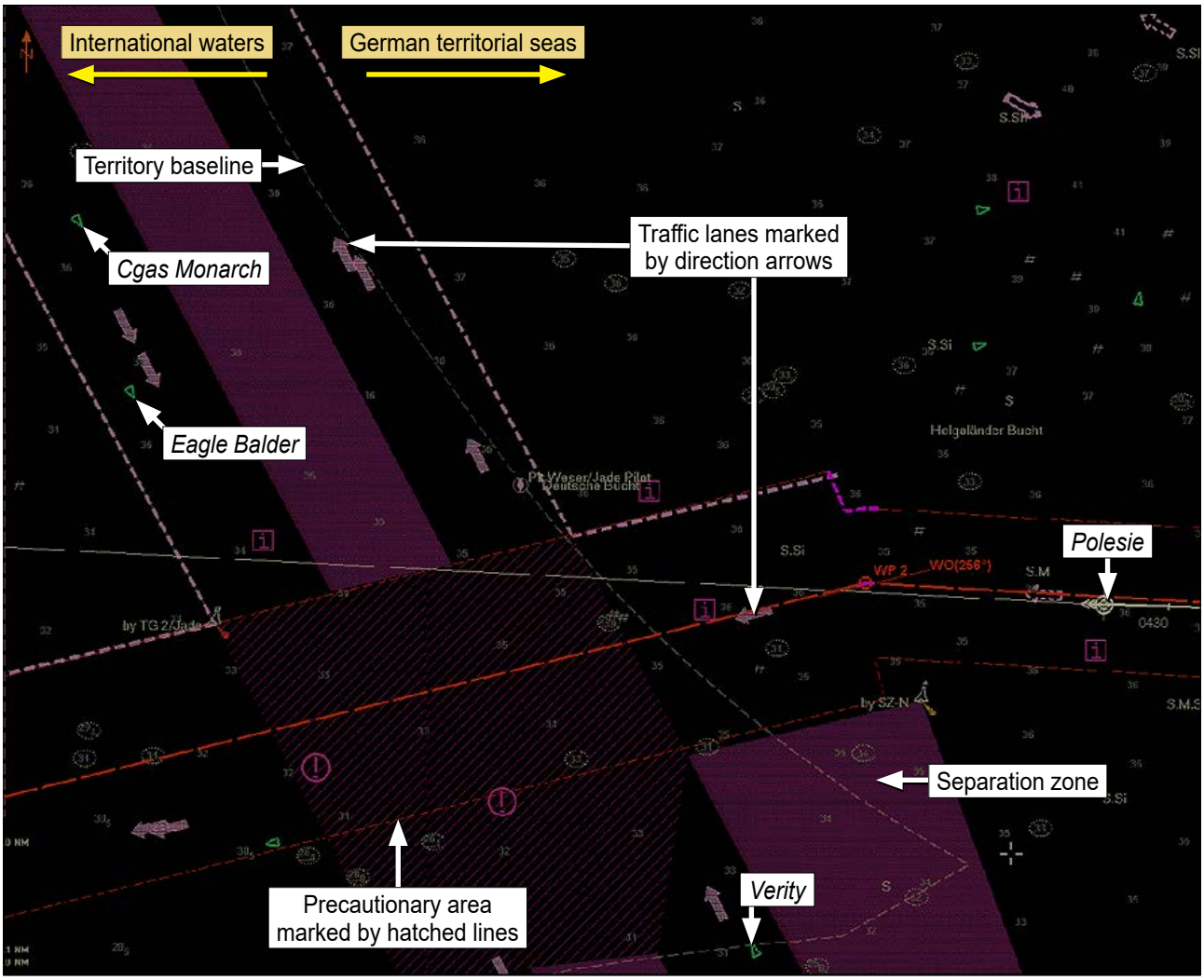


Figure 5: *Polesie*'s ECDIS display at 0433

By 0443, *Polesie* was approaching its waypoint at the entrance to the westbound lane of the TSS and *Verity* was entering the crossing area of the TSS **(Figure 6)**. *Verity* was on *Polesie*'s port bow, bearing 224° at 2.46nm range. *Polesie*'s AIS unit showed *Verity* would pass close astern at a CPA of 0.11nm, with a TCPA in 14 minutes and 42 seconds **(Figure 6** inset**)**. The AIS also showed two vessels, *Eagle Balder* and *Cgas Monarch*, heading south in the TSS to the Jade river, and both passing clear ahead of *Polesie* by 5.2nm and 3nm respectively.

At 0444:30, *Polesie* passed its planned waypoint, heading 273° at 11kts. The weather had deteriorated; the wind had veered to the south-east and increased to force 6; it was cloudy, with intermittent light rain and good visibility.

At 0446:03, *Polesie* crossed its planned track line of 256°, and its heading remained at 273°. *Verity*'s heading and speed were unchanged and, from *Polesie*, was bearing 223° at 1.95nm range, with a CPA of 0.18nm and TCPA of 12 minutes and 14 seconds.

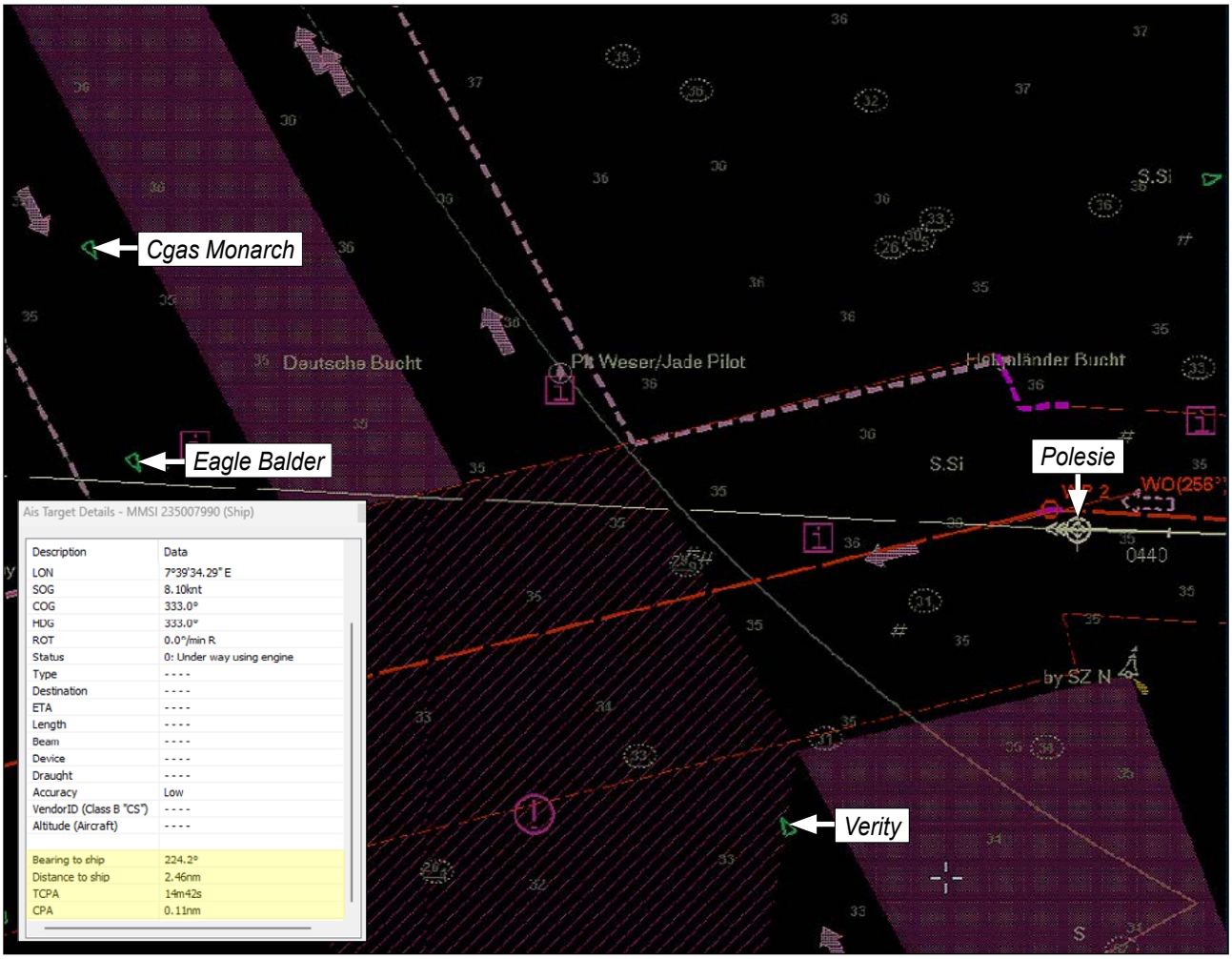


Figure 6: *Polesie*'s ECDIS display at 0443 and (inset) *Verity*'s AIS information extracted from *Polesie*'s VDR

At 0448:48, *Polesie*'s C/O changed the autopilot heading input to 264° and initiated a series of nine near-continuous adjustments of course that culminated at 0449:59, when the C/O made another change of heading input to 245°, by which time *Verity* was bearing 220° at 1.33nm.

The German Bight Traffic VTS assistant had been monitoring *Verity* and *Polesie*, identified that a risk of collision existed and noted that *Verity* had not acted as expected of a give-way vessel **(Figure 7)**. At 0450:09, when the two vessels were less than 1.3nm apart, the VTS assistant called *Verity* and the exchanges shown in **Table 1** occurred, with both parties speaking in a conversational tone. The VTS assistant had also taken two routine shipping reports in the 3 minutes before contacting *Verity* but it is unknown what other watchkeeping tasks they were required to perform.

At 0451:02, *Polesie*'s C/O changed the autopilot heading from 245° to 252° despite the vessel's heading being 256° and therefore arresting the turn. By the end of the VHF exchanges, the two vessels were 1nm apart with a CPA of less than 0.2nm and TCPA in 5 minutes and 16 seconds.

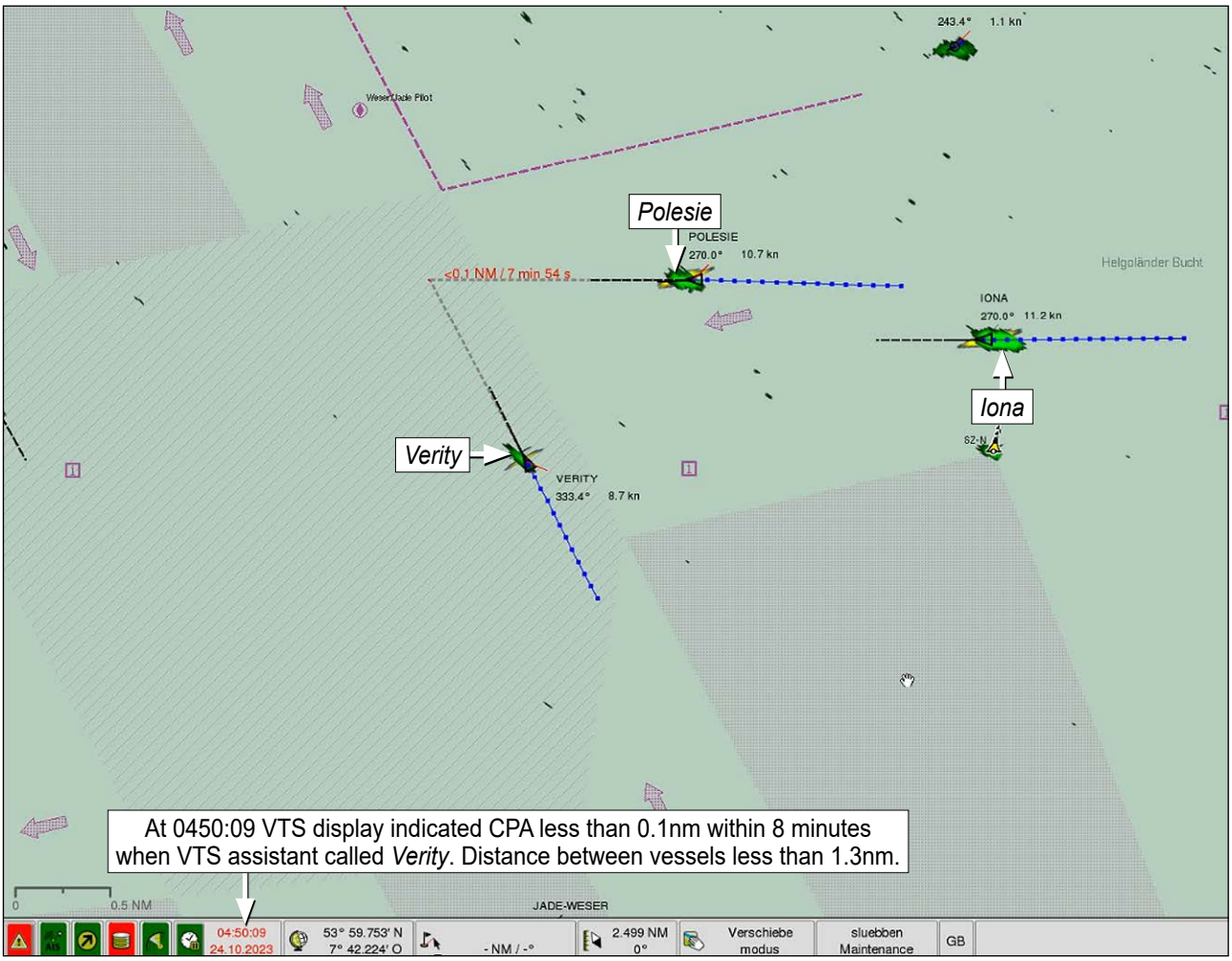


Figure 7: Reconstruction of 0450:09 VTS display when VTS assistant called *Verity*

Time	Station	Transmission
0450:09	VTS	*"Motor vessel Verity, motor vessel Verity, Mike Golf Delta Lima two, German Bight Traffic"*
0450:22	*Verity*	*"Motor vessel Verity replying"*
0450:25	VTS	*"Yes, good morning sir, according to my radar screen you have a very small CPA with the motor vessel on your starboard side, the Polesie, what is your intention?"*
0450:49	*Verity*	*"My intention is keep my course and speed, it's possible change course to port and then will pass on my stern* [undiscernible]*"*
0451:04	VTS	*"According to the rules you have to act to avoid a collision, and have you talked to the motor vessel Polesie?"*
0451:15	*Verity*	*"Ok, I will change my course to starboard and will pass on* [undiscernible] *aft"*
0451:24	VTS	*"Yes, ok, I will inform motor vessel Polesie that you will pass astern of motor vessel Polesie"*
0451:30	*Verity*	*"Ok, I will pass astern of motor vessel Polesie"*

Table 1: VTS and *Verity* VHF exchange

The VTS assistant then advised *Polesie* of the situation during the VHF exchange shown in **Table 2**, which was carried out in a conversational tone:

0451:36	VTS	*"Polesie, Polesie, Charlie six X-ray Papa three, German Bight Traffic"*
0451:46	*Polesie*	*"Yes German Bight Traffic Polesie replying"*
0451:50	VTS	*"Yes sir, there's a small CPA with the motor vessel Verity on your port side so the motor vessel Verity will pass behind you, he told me he will come to starboard and pass behind you, please be aware of the situation"*
0452:03	*Polesie*	*"Yes, I will be looking and be a little to starboard"*

Table 2: VTS and *Polesie* VHF exchange

At 0452:26, *Verity*'s heading altered to starboard. Eleven seconds later, *Polesie*'s watchkeeper selected *Verity*'s AIS icon on the radar on the 6nm range **(Figure 8)**, which showed its status information on the screen. It showed that *Verity* was at a range of 0.83nm, had a CPA of 0.2nm and a TCPA in 3 minutes and 40 seconds with a bow crossing range (BCR), passing ahead, of 0.23nm in 2 minutes and 33 seconds.

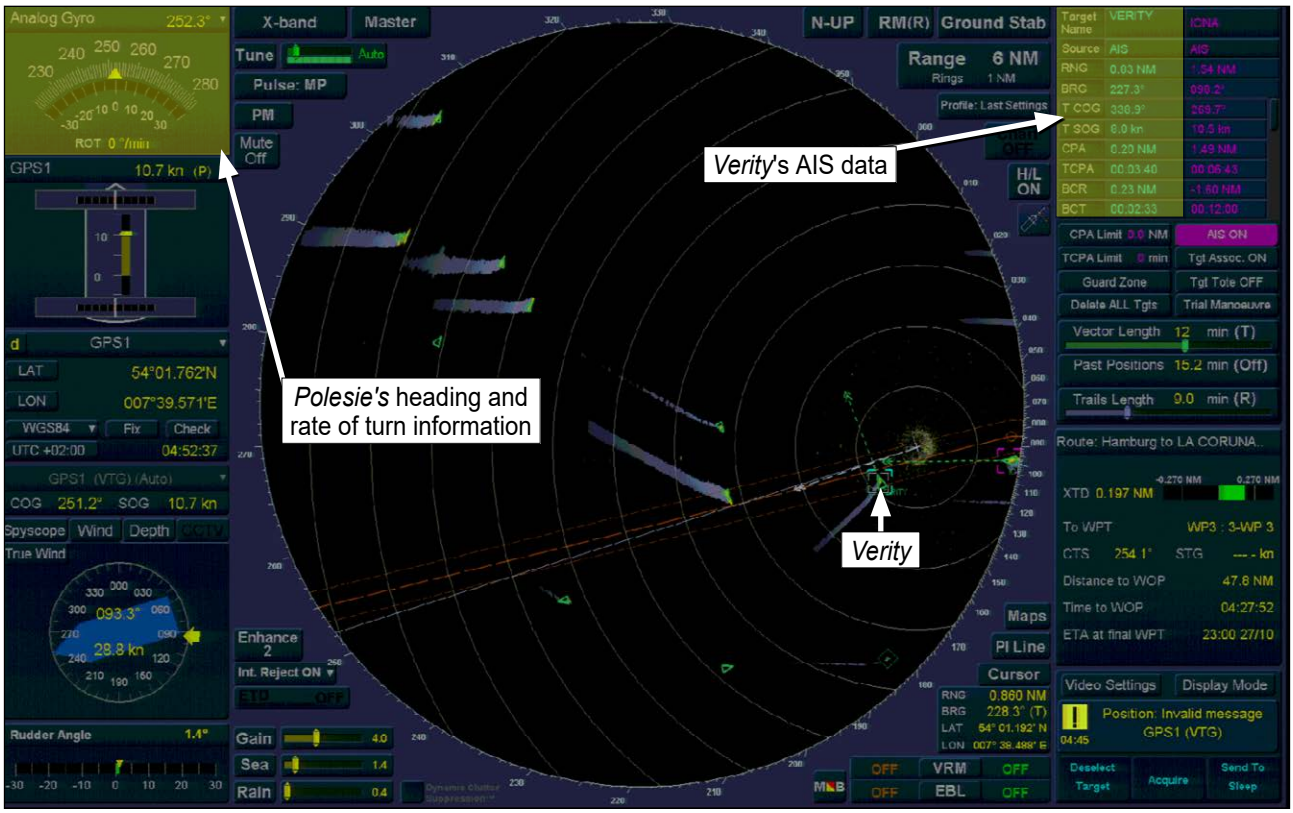


Figure 8: *Polesie*'s radar at 0452:37 with *Verity* selected

1.3.2 The collision

From 0452:55, and over the next 14 seconds, *Polesie*'s C/O slowly changed the autopilot heading from 252° to 235°. The C/O changed it further over the course of the next 43 seconds, to 212°. The two vessels were by then 0.6nm apart with *Verity* 15° on *Polesie*'s port bow. The second steering motor was not started to indicate preparation for an enhanced steering response.

By 0453:43, *Verity*'s heading was 020° and *Polesie*'s was 243°. The VTS display **(Figure 9)** showed *Polesie*'s AIS vector profile tending to port and, in response, the VTS supervisor transmitted on duplex VHF channel 80:

> *"Motor vessel Polesie this is German Bight Traffic"*

As the transmission ensued, *Polesie*'s C/O changed the autopilot further to 202° and responded:

> *"Yes motor vessel Polesie replying"*

Both sides of the exchange took place in a conversational tone.

Then, the VTS supervisor replied in an elevated and urgent tone:

> *"Do not come to port side, do not come to port side, come to starboard side Polesie, alter your course to starboard side"* and the C/O responded with, *"Yes to starboard"*

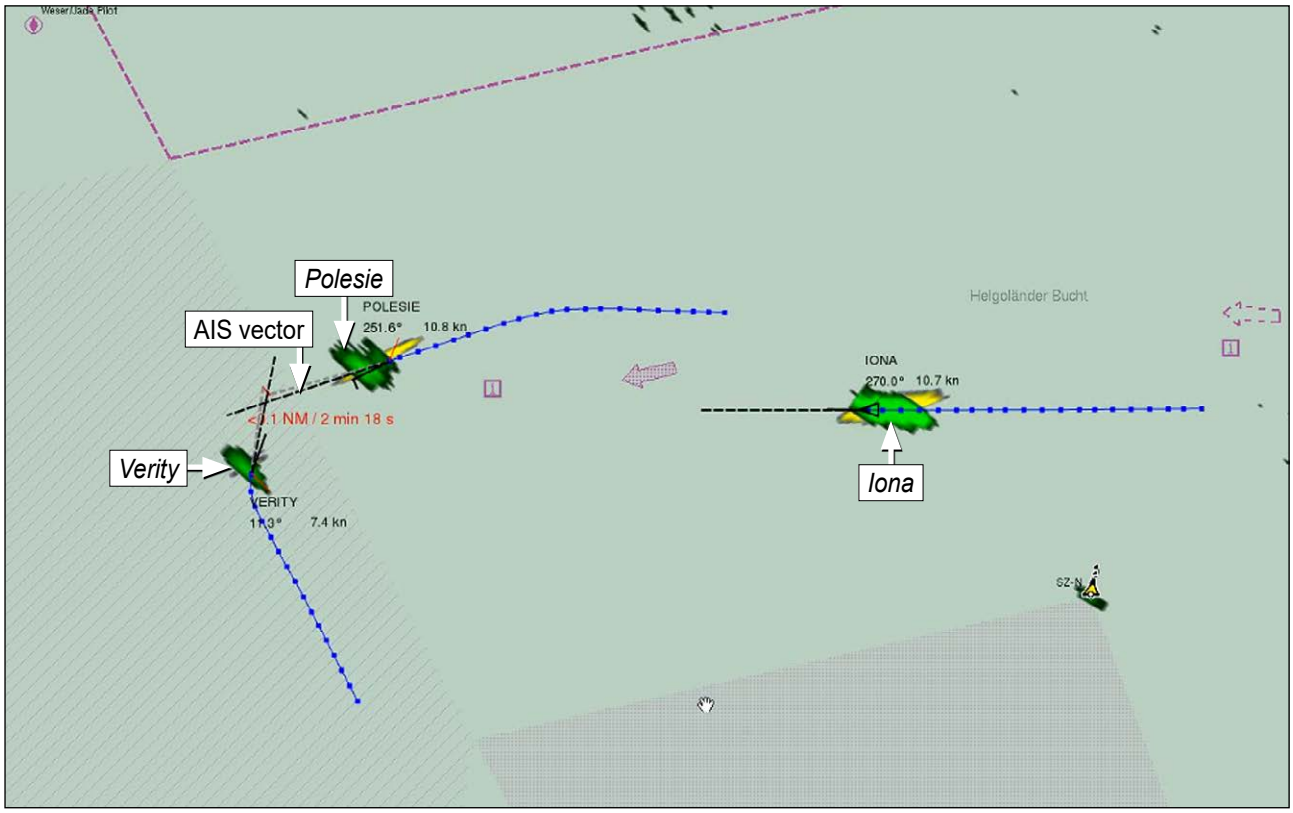
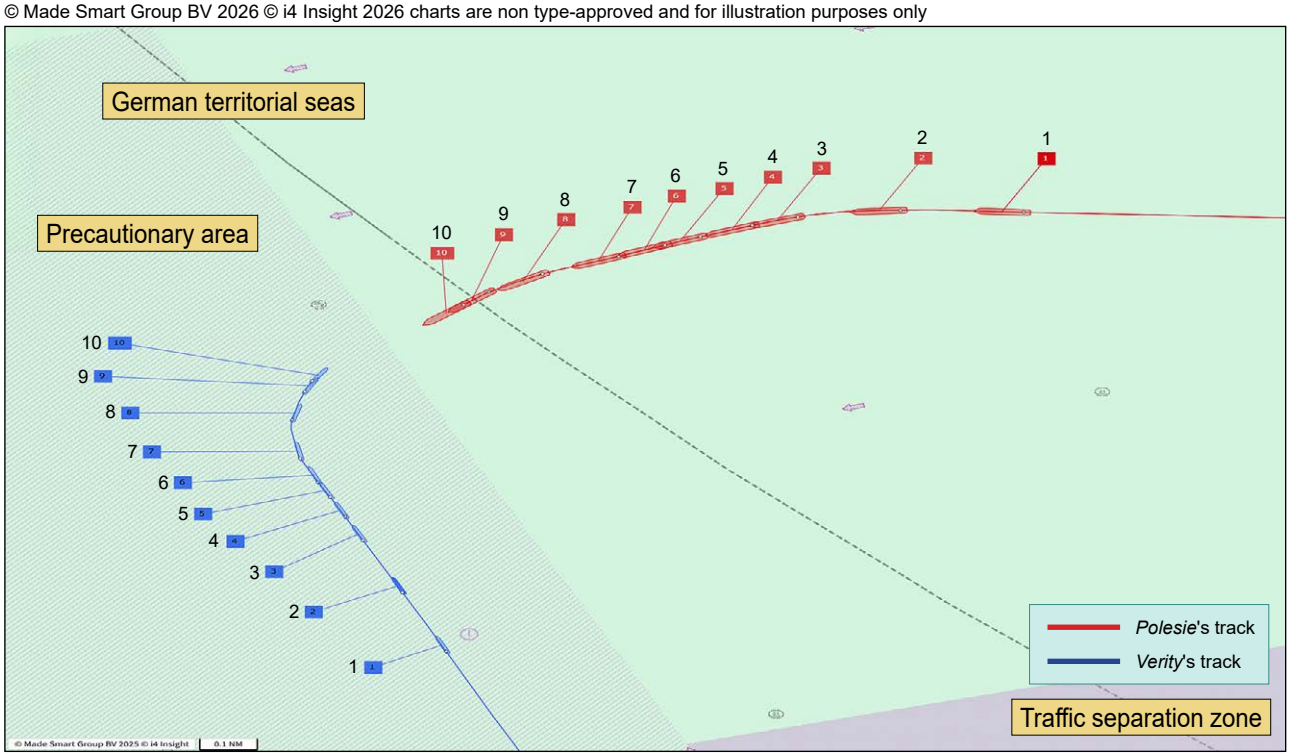


Figure 9: 0453:49 VTS display immediately before VTS supervisor calling *Polesie* and instructing it to turn to starboard. Distance between vessels less than 0.5nm

At 0454:18, 9 seconds after their reply to VTS, *Polesie*'s C/O had switched to manual steering and put the vessel's rudder hard to starboard. Coincidentally, *Polesie* entered international waters. *Verity* was slowly altering course to starboard almost right ahead of *Polesie* at about 0.4nm **(Figure 10)**.



Point	*Verity* bearing from *Polesie*	Range between vessels (nm)	Time	Event
1	222.8	1.5	0448:47	*Polesie* started alteration of course to port near waypoint 2
2	222.6	1.3	0450:00	VTS call to *Verity*
3	223.5	1.1	0451:02	*Polesie* autopilot set at 252°
4	224.6	1.0	0451:30	Not applicable
5	225.1	0.9	0452:03	Not applicable
6	225.9	0.9	0452:26	*Verity* started alteration to starboard
7	228	0.8	0452:55	Radar target acquired on *Polesie* 18 seconds earlier
8	230.4	0.6	0453:43	VTS call to *Polesie* "come to starboard" 6 seconds later
9	232.7	0.4	0454:19	*Polesie*'s rudder hard to starboard
10	234.6	0.3	0454:34	*Polesie* rate of turn zero

Figure 10: Made Smart Group reconstruction of relative positioning of both vessels between 0048 and 0454

At 0454:32, the VTS supervisor advised the passenger vessel *Iona* that there was a dangerous situation developing ahead of it and that they should keep clear.

At the same time *Polesie*'s rate of turn to port had steadied, and soon after changed to starboard with *Verity* close right ahead. *Verity*'s course had steadied at 038°. At 0455:21, *Polesie*'s C/O put the rudder hard to port.

At 0455:28, the bulbous bow of *Polesie* collided with the starboard side of *Verity* about 11m forward of the accommodation, at a broad angle and a relative speed of approximately 12kts.

1.3.3 Post-collision events

Following the collision, *Verity* was pushed around the bow and contacted the starboard anchor and the starboard side of *Polesie*'s hull **(Figure 11)**. *Verity*'s speed reduced quickly as it scraped down the side of *Polesie*, on which the C/O had reduced the engine speed to half ahead.

Figure 11: Paint marks on *Polesie*'s anchor and bow

At 0456:53, with *Verity* clear, *Polesie*'s C/O put the rudder to midships and called the master using the bridge telephone. A minute later, the master came to the bridge as VTS called *Polesie* and asked what had happened. The C/O advised the master that a collision had occurred. Simultaneously, VTS staff tried to contact *Verity* without success.

On *Verity*, the force of the collision had alerted all the crew below in the accommodation. They quickly dressed and, once in the accommodation alleyway, one of the crew members advised them to retrieve their lifejackets and survival suits and go to the bridge. One crew member reported seeing the master, C/O and another crew member on the bridge when they arrived there.

Verity started to sink by its bow and list to starboard. Without warning, the vessel heeled severely. Fearing capsize, the 2/O scrambled to the open port bridge wing door and was quickly immersed in the sea. On the deck below the bridge an able

seaman (AB) escaped through the accommodation door, grabbing a lifebuoy as the vessel sank. The 2/O found and held onto a wooden pallet that floated near to them. Both the 2/O and AB were dressed in their everyday clothes and were without lifejackets. The AB also recalled seeing another crew member and the chief engineer in the water.

At 0459:04, *Verity*'s AIS transmission ceased, and about a minute later the vessel sank in 36m of water.

On *Polesie*, the master had ordered a further reduction in speed and turned the vessel to port to stay in the general location while the crew carried out a damage assessment. At 0508, the VTS supervisor called *Polesie* and asked if there was damage, to which the master replied that there was no water ingress. VTS then instructed *Polesie* to return to the scene and search for *Verity*. Close by, the passenger vessel *Iona* had also slowed and was attempting to locate *Verity*.

VTS alerted the search and rescue (SAR) authority, the Maritime Emergency Reporting and Assessment Centre (MERAC)[5] in Cuxhaven, Germany, which issued a request for all available vessels, including *Polesie* and *Iona*, to assist in the rescue. MERAC notified the Maritime Rescue Coordination Centre at Bremen, Germany, requested that SAR air assets be deployed and convened a crisis management team. Multiple vessels and air assets that had been conducting an exercise nearby, along with *Polesie* and *Iona*, carried out a search for *Verity* and its crew. *Verity* was not seen by any vessel.

At about 0620, over an hour after the collision, the crew on lookout duties on *Polesie*'s bow heard a voice and, while using their torches to locate the source, saw reflective tape in the water. Subsequently, they saw *Verity*'s AB, clinging to a lifebuoy. They notified the master, who slowed the ship while the crew threw a line to the AB, who tied it to the lifebuoy. *Polesie*'s crew then hauled the AB to the main deck.

At 0705, one of the rescue vessels, *Nordic*, recovered a lifeless person. At about the same time, a SAR helicopter located *Verity*'s 2/O in the water. The 2/O was winched on board and transferred to hospital ashore. *Nordic*'s rescue craft took the lifeless person from *Nordic* and transferred them to *Iona*. At 0745, *Iona*'s doctor declared the person rescued by *Nordic* deceased.

The two survivors and the one deceased person, subsequently identified as *Verity*'s master, were later transferred ashore.

MERAC had requested dive support during the SAR operation, but weather conditions and the diving depth prevented immediate diving activity. SAR operations continued throughout the day with multiple air and sea assets. At 1015, one SAR vessel recovered *Verity*'s empty liferaft. By 1330, the German authorities had released *Polesie* from the scene, and it proceeded to a berth at Cuxhaven where it was later boarded by MAIB, BMA and BSU investigators.

SAR operations ceased at 2200 the same day. No further survivors or bodies were found, and four of *Verity*'s crew remained unaccounted for. The starboard liferaft, stowed on the bridge wing, was not recovered.

[5] The communication centre of the Central Command for Maritime Emergencies.

1.4 LOCATION

The German Bight is the name given to the south-eastern corner of the North Sea that is bounded by the Netherlands and Germany to the south and by Denmark and Germany to the east **(**see **Figure 1)**. The adjacent ports of Hamburg, Bremerhaven, Emden and the Kiel Canal as well as Germany's only deepwater port, Wilhelmshaven, marked this as a busy waterway. Marine traffic was controlled by an arrangement of lanes leading to and from the ports. Traffic heading east/west was accommodated by the Terschelling-German Bight TSS, while that heading north-north-west/south-south-east for the approaches to Wilhelmshaven or Bremerhaven used the Jade Approach TSS.

Section 4.210 of the Admiralty Sailing Directions NP55, North Sea (East) Pilot, warned *extreme caution is necessary when navigating the E-bound and W-bound lanes of the Terschelling-German Bight TSS at their junctions with the Jade Approach TSS*. European Maritime Safety Agency data[6] indicated the area could experience traffic of similar density to the Dover Strait.

1.5 ENVIRONMENT

At the time of the collision, the water and air temperatures were 13° Celsius (°C). Wind was from the east Beaufort force 5 to 6 but increased in gusts to force 7, and a strong wind warning of force 8 had been issued by the Marine Weather Service Hamburg at 0130 on 24 October. Visibility ranged between 10km and 31km but reduced in rain to 2.7km. There was a shallow low-pressure system (1,000 hectopascals[7]) over the Benelux[8] region that deepened into a storm and moved into the central North Sea as 24 October progressed.

1.6 CREW SURVIVABILITY

Survivor accounts indicated *Verity*'s crew were in day clothing, and none were seen with immersion suits and/or lifejackets as *Verity* capsized. The range of estimated survival times in 13°C water was 2.8 hours to 7 hours[9]: without buoyancy aids, it was unlikely that survival would extend beyond the lower of the two figures. The corresponding recommendation for the duration of SAR operations in these conditions was about 16 hours.

1.7 SALVAGE

The position of *Verity* was identified by searching vessels using side-scan sonar on 25 October 2023. Germany's Federal Government ordered the salvage of the vessel. During preparation for salvage, detailed sonar scans were conducted on *Verity*'s hull. These showed that the cargo had shifted forward and penetrated the cargo hold's forward bulkhead **(Figure 12)**. The force of incoming water and the effect of the sinking had removed all but two of the hatch lids from the ship as *Verity* sank.

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[6] Data from 2019 available at: https://emodnet.ec.europa.eu/en/traffic-density-maps-better-understanding-maritime-traffic-0

[7] Also called millibars.

[8] Belgium, the Netherlands and Luxembourg.

[9] Various references, including Golden, F. and Tipton M.J. (2002) Essentials of Sea Survival.

Image courtesy of Koole Contractors

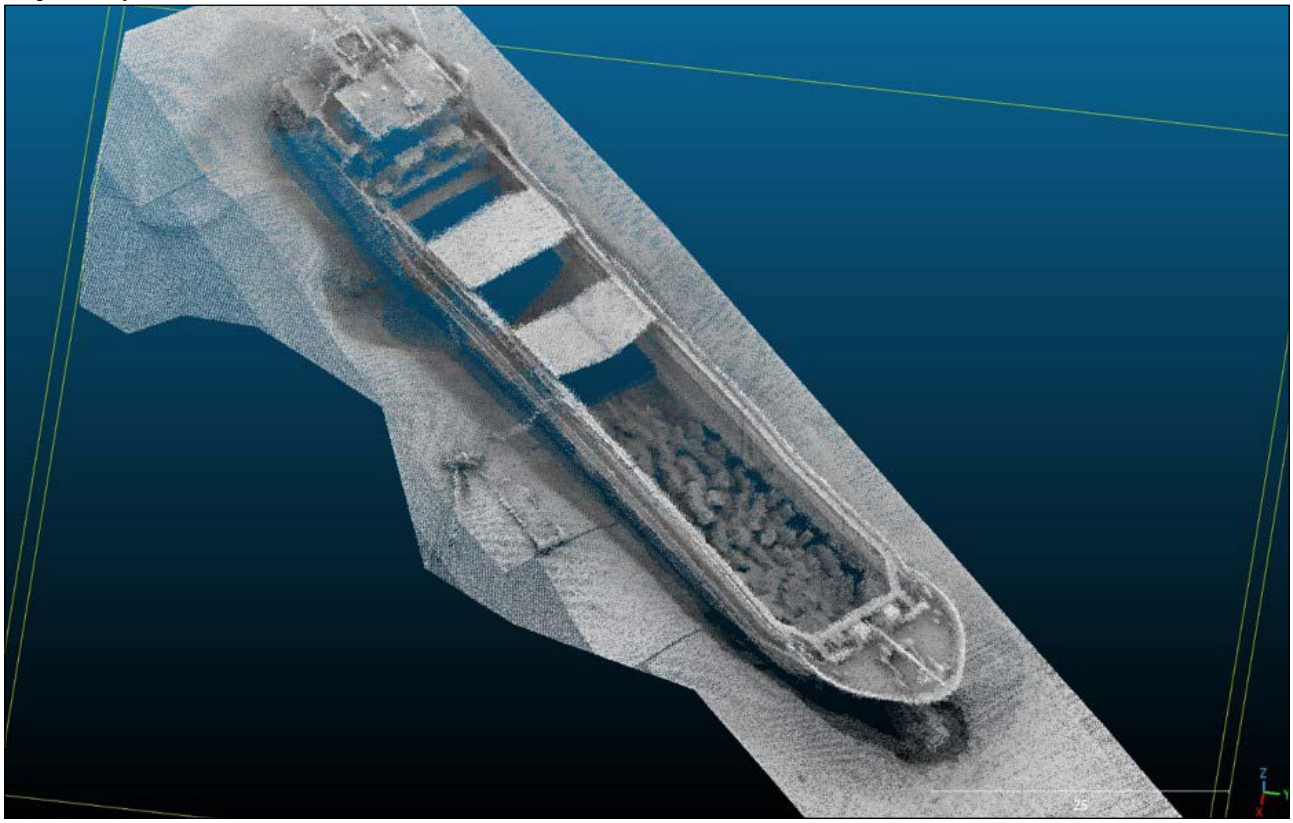

Figure 12: Side-scan sonar picture of *Verity* on seabed, showing shift of cargo and missing/ collapsed hatch covers

Verity was salvaged in two sections during late August and early September 2024 and taken to a shipyard in Rotterdam, the Netherlands. During an inspection of the vessel, the C/O's body was found in the accommodation and an AB's body was found in mud in the cargo hold. The chief engineer and AB/cook remained unaccounted for.

A post-salvage inspection by the investigation found that, notably:

- The starboard side of the hull had a large breach that penetrated number 3 side and double bottom ballast tanks, and the single cargo hold **(Figures 13a** and **13b)**.
- Three of the steel coils carried as cargo, which were not recovered from the vessel during salvage, were in the forward deck store and hold entrance shaft, having breached the cargo hold bulkhead **(Figure 13c)**.
- The bridge had been destroyed, likely from a combination of the collision, sinking, and time on the seabed. There was no recoverable evidence from the bridge **(Figure 14)**.
- The rescue boat on the starboard side was missing.
- The starboard search and rescue transponder (SART)[10] was found with its activation cover removed. Its location at the starboard wing door was destroyed, possibly during the collision.

[10] A waterproof, self-contained, battery-operated device intended for use in maritime SAR operations.

- The emergency position indicating radio beacon (EPIRB) was found on the aft deck. Its housing cover and hydrostatic release were absent and the leaf spring that ejected the EPIRB had activated **(Figure 15)**. It could not be determined what had prevented the EPIRB from surfacing.

- The rescue boat was recovered on 18 November 2023.

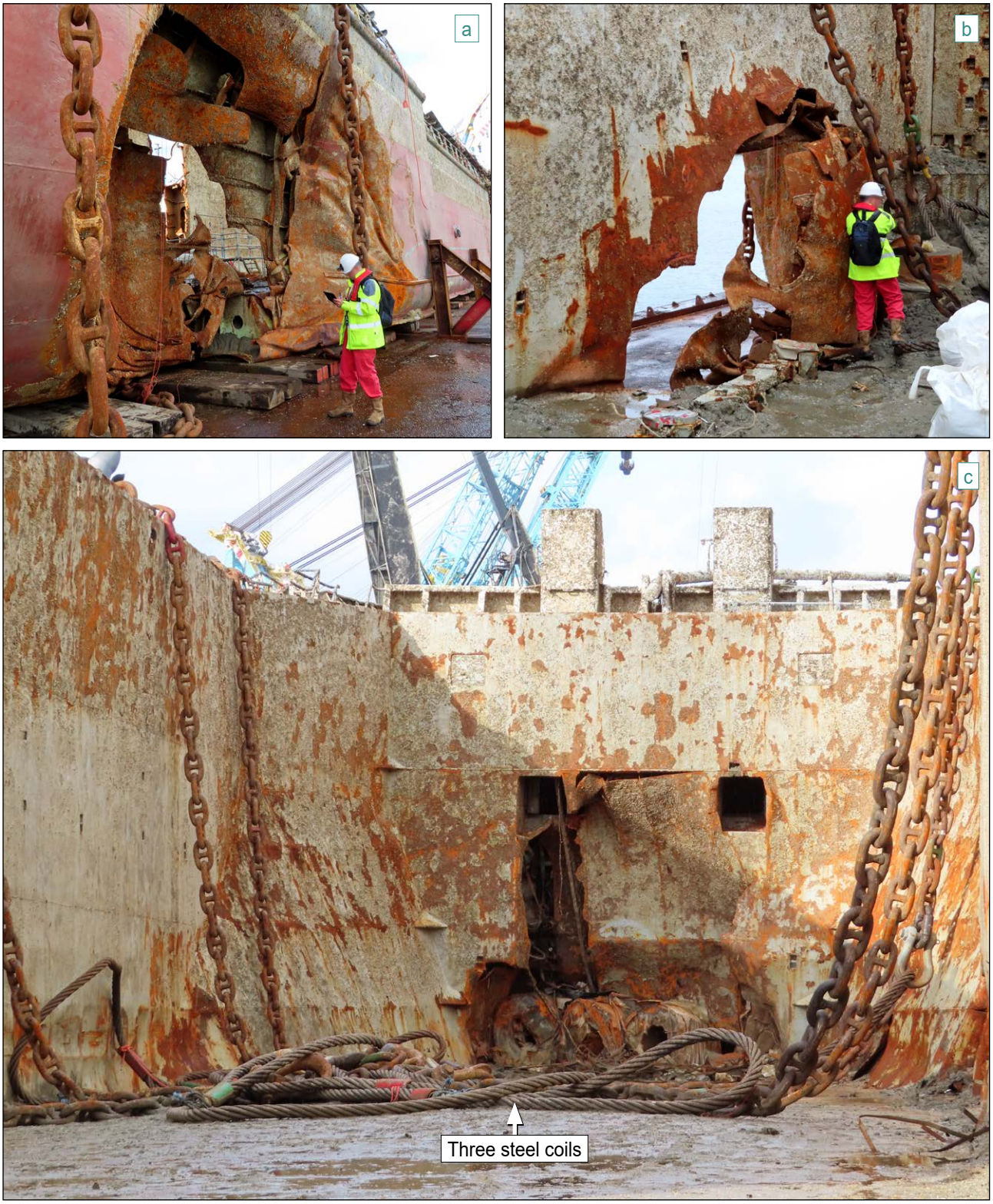

Figure 13: Damage to *Verity*'s hull (a and b) and steel coils in forward hold (c)

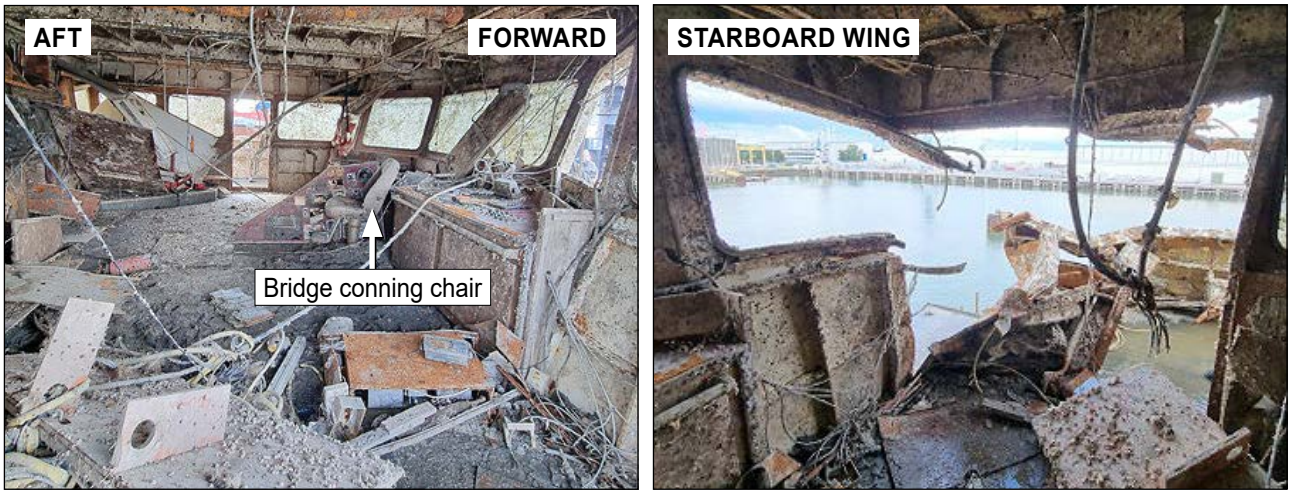

Figure 14: Bridge condition post-salvage and damage to starboard wing

Figure 15: EPIRB housing with cover missing and ejection leaf spring deployed

1.8 *POLESIE*

1.8.1 General information

Polesie was a 24,055 gross tonnage (gt) solid bulk geared cargo ship that traded worldwide. It was owned and operated by the company Polska Żegluga Morska P.P. (Polsteam). The vessel was constructed to ice class standard 1C, which required, among other things, strengthening of the hull plating especially at the bow; this allowed it to operate in light ice conditions.

The vessel had five holds and was equipped with four centreline cranes of 30t safe working load. The cranes restricted visibility directly ahead by 2.5° either side of the centreline; a restriction that was within the maximum allowed by international regulation.

1.8.2 Bridge equipment

Polesie's integrated bridge incorporated an ECDIS unit in the centre console flanked by two radars with automatic radar plotting aid (ARPA) function; the starboard radar operated on an X-band frequency, and the port radar on an S-band frequency[11]. At the rear of the bridge was a second linked ECDIS primarily used for voyage planning. Additionally, the bridge had an AIS unit, a Bridge Navigational Watch Alarm System (BNWAS), a global positioning system (GPS), and two VHF transceivers. All bridge equipment was reportedly functioning normally. The primary conning position was at the starboard chair.

The ECDIS incorporated the ship's navigational systems, allowing it to display AIS and radar information on its screens. The user could set expected alarm functions for the bridge navigation equipment[12].

The VDR recorded:

- the centre console and planning ECDIS, and radar displays;
- log speed, GPS and AIS information;
- telegraph engine speed (ordered/actual);
- helm control status and rudder angle (ordered/actual)
- bridge audio, including the external bridge wings and primary VHF;
- BNWAS status; and
- selected bridge and engine room alarms.

The VDR audio recording contained no evidence that the ship's sound signalling apparatus had been operated before the collision or that sound signals had been made by *Verity*.

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[11] X-band operates at a higher frequency – 8 gigahertz (GHz) to 12 GHz – and is used to achieve a sharper image and better target resolution. S-band (2 GHz to 4 GHz) has a larger antenna and can penetrate through heavy rain or fog..

[12] Such alarms would include navigation cross track error, equipment malfunction and range alerts for radar contacts.

1.8.3 Manoeuvrability

Polesie was powered by a 7,368 kilowatt (kW) engine and fitted with a semi-balanced rudder. Its manoeuvring data showed it took 6 minutes and 24 seconds for the propulsion to alter from full ahead to full astern, and it would take 8 minutes 20 seconds for the ship to come to a stop, in which time it would advance about 1.1nm. The turning circle diagram showed that, at full starboard rudder, it would take the ship about 2 minutes to alter course by 90°, during which it would advance 600m through the water.

1.8.4 Crew

Polesie's 20 crew of mixed nationalities comprised 14 Polish, four Ukrainian, one Bulgarian and one Romanian. All the crew were appropriately qualified for their roles.

The bridge team worked a 4 hours on/8 hours off watchkeeping schedule with the C/O on watch from 0400 to 0800, third officer from 0800 to 1200 and 2/O from 1200 to 1600. The ABs were similarly scheduled for lookout duties but were habitually not used for that function; the officer of the watch (OOW) frequently operated alone on the bridge following port calls when the ABs were used for hatch cleaning and cargo duties.

The C/O was on their fifth contract with Polsteam, had been in rank for over 20 years and held an STCW[13] II/2 Master Unlimited Certificate of Competency (CoC). The C/O reported that they did not feel tired or fatigued when taking over the watch and had commented as such during the watch handover as evidenced from the VDR.

1.8.5 Master's standing orders

The master's standing orders were issued as part of the company's safety management system (SMS) that was common to Polsteam's fleet. The standing orders set out the responsibilities and requirements for OOWs that included the requirements for lookouts and the operation of navigational equipment.

In particular, the orders stated, among others, that:

> *The most important duty of the Officer on watch is to ensure appropriate visual, aural and electronic observation carried out in a constant reasonable, professional and effective manner, with the use of all equipment.*
>
> *The Officer on watch must consistently comply with the COLREG requirements. In accordance with COLREG, he shall not hesitate to use the siren and the ship main propulsion when necessary. And when changing course, with regard to presence of another vessel, he shall make a significant turn early enough so that the intentions of the Officer on watch were clear for this other vessel.* [sic]

[13] International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW Convention).

Additionally, the orders required that:

> *If the Officer on watch has any doubts regarding intentions of another vessel or he finds that its position remains unchanged, he shall call the master, at best when the distance to this other vessel is still more than five nautical miles.* [sic]

For the passage from Hamburg to A Coruña these orders were supplemented by the master's written instructions in the Bridge Order Book, as follows:

1. *Pls follow master's standing orders which are still in force*
2. *Maintain sharp look out, especially in dense cross traffic areas*
3. *Monitor weather conditions*
4. *In any doubts call master.*

These had been signed by the master and three deck officers. They were an exact replication of the orders for the departure from Liverpool to Hamburg on 12 October 2023.

1.8.6 Ownership and management

Polsteam was a state-owned enterprise based in Szczecin, Poland and had been operating for just over 70 years. It had a fleet of 54 ships, mostly dry bulk carriers, ranging from 30,000 to 80,000 deadweight tonnage (DWT). It also operated four ferries in the Baltic Sea between Poland and Sweden.

1.8.7 Safety management system and inspection

Chapter 3 of Polsteam's SMS manual detailed navigational instructions. The instructions included use of radar, standards of lookout, the use of automatic plotting and detections including the use of safety zones and CPA alarms.

The vessel had been inspected as part of the owner's inspection protocol on 19 October 2023. As part of that inspection, it was noted that all relevant international safety management procedures regarding navigational safety were known to the bridge crew.

1.9 *VERITY*

1.9.1 General information

Verity was a 2,601gt general cargo ship that for the previous 5 years had traded in North and West Europe and the Mediterranean, carrying a variety of general cargoes.

1.9.2 Bridge equipment

Verity's bridge was equipped with two X-band radars with ARPA functions, two fixed VHF units, AIS, ECDIS, BNWAS and GPS. The main conning position was at the centreline from a fixed chair. Two SARTs were located at each bridge wing door and an EPIRB was in a housing at the port after quarter of the bridge deck.

1.9.3 Manoeuvrability

Verity was powered by a 1,710kW main engine that gave a service speed of 13kts and had a high efficiency flap rudder.

The manoeuvring data for *Verity* was obtained from its sister vessel *Fri Sea*. The data showed that, in the loaded condition, the vessel was capable of a crash stop from 10kts in 2 minutes and 9 seconds. Its turning circle at half ahead changed heading 90° in 56 seconds, a rate of 96° per minute.

1.9.4 Crew

Verity had seven crew of mixed nationalities, including one Russian, one Ukrainian, one Indonesian, and four Filipinos. All the crew were appropriately qualified for their roles. The master and navigating officers operated a 4 hours on/8 hours off watch system with the master on watch from 0800 to 1200 and 2000 to midnight, the 2/O from 1200 to 1600 and midnight to 0400, and the C/O from 0400 to 0800 and 1600 to 2000. The AB lookouts were used on the 6 to 12 and 12 to 6 watches across a 24-hour period.

The Filipino master was 48 years old and had served with Faversham Ships Ltd (Faversham) for several years, having started as an AB. They held an STCW II/2 Master Unlimited less than 3,000gt CoC.

The Russian C/O was 46 years old and was employed on their first contract with Faversham. They had several years' previous experience with a company that operated ships of a similar size. They held an STCW II/2 Chief Mate Unlimited less than 3,000gt CoC.

1.9.5 Management

Verity had been managed by Faversham since 2008. Faversham was established in 1994 and managed eight other coastal size ships of between 1,800 DWT and 3,200 DWT, carrying a variety of general cargoes.

1.9.6 Safety management system and audits

Faversham had a generic SMS for its fleet. Its document of compliance was issued by the Isle of Man Government on 21 April 2020 and had undergone three annual verification checks. The last had been completed by the UK Maritime and Coastguard Agency (MCA) on 25 April 2023.

Faversham had completed internal audits of the SMS, most recently in September 2023. No significant defects or nonconformances were identified.

The SMS had a section titled *Watch Keeping at Sea* that set out the company's requirements and included:

> *The officer in charge of the navigational watch is the master's representative and is primarily responsible at all times for the safe navigation of the ship, particularly concerned with avoiding collision and stranding and complying with the International Regulations for Preventing Collisions at Sea, 1972, as amended.*

The SMS also affirmed that the OOW could be the sole lookout in daylight under several conditions in line with the STCW Code.

Under the heading *Performing the Navigational Watch* the SMS detailed requirements for navigation that included:

> *Alteration of course or speed in compliance with the International Regulations for Preventing Collisions at Sea, 1972, as amended, must be carried out in accordance with the Regulations and must be accompanied by the appropriate signals. The officer of the watch shall not hesitate to sound signals in accordance with the Regulations.*

The SMS provided instructions for calling the master and gave several examples of situations, which included *if the traffic conditions or movements of other vessels are causing concern*. It also contained clear instructions on when to operate in hand steering, voyage planning, including reference to sailing directions, and the need to be aware of hazards along the route.

1.9.7 Cargo, hold and ballast tank arrangement

Verity had a single cargo hold with a volume of 5,204m³. Two movable bulkheads, used primarily for grain carriage, were stowed at the aft end and could be fixed transversely to divide the hold into three separate cargo compartments. The moveable bulkheads could be made grain tight but not watertight.

At the time of the accident, *Verity* was carrying 186 steel coils weighing 3,262t that were stowed longitudinally, two coils high, in the mid part of the hold. The lashing system comprised 24mm dunnage boards with wedges between the coils and the cargo hold plating, with medium carbon steel straps securing each coil to the next, creating a homogenous unit. The lashing system was approved by Lloyd's Register, fitted by stevedores at Weserport, Bremen, and inspected and approved by *Verity*'s master.

The average stowage factor for steel coils was about 0.5m³/t and the cargo occupied approximately 1,600m³ of the cargo hold, or 30%. The stowage factor included the centre space of the coil.

The two ballast tanks affected by the collision, number 3 starboard side and double bottom, had capacities of 116.5m³ and 145.4m³ respectively.

1.10 GERMAN BIGHT TRAFFIC

1.10.1 Vessel traffic services

The Inner German Bight VTS required mandatory ship reporting for vessels proceeding to and from the Elbe, Jade and Weser rivers. The VTS area encompassed the TSS areas for the German Bight Western Approaches and the eastern part of the Terschelling-German Bight TSS. The Admiralty List of Radio Signals Volume 6, Part 2 stated that:

> 1. *The services provide regulatory measures to prevent accidents and/or threat to the environment, control of traffic flow, by information, warning, advice, or instruction.*

2. *The fact that a VTS system is in operation in a given area shall not relieve the master of his duty to comply with the provisions of the Collision Regulations and, while navigating in the area of German jurisdiction, to comply with any supplementary national rules or regulation as may be applicable.*

The German Bight/Jade Approach TSS VTS personnel were based in Wilhelmshaven, Germany.

1.10.2 Policies and procedures

The Waterways and Shipping Authority provided VTS as directed by the German Directorate General for Waterways and Shipping (GDWS)[14]. The applicable regulations were the German Traffic Regulations for Navigable Maritime Waterways (May 2023) for waters within the 12-mile territorial sea limit, and SOLAS[15] Chapter V Regulation 12 – Vessel traffic services – for international waters.

GDWS published general guidance on waterways in VV-WSV 2408 and its provision for 'Operation of a Vessel Traffic Service (VTS)' in document VV-GDWS 24-2, which set out the policies and procedures for traffic control operation. Its stated objectives were:

- prevention of threats to the safety and efficiency of shipping;
- prevention of dangers emanating from shipping, including those to the marine environment, and
- keeping waterways in a condition fit for shipping.

The document identified two levels of operational VTS personnel:

- Nautical supervisor, whose responsibilities included the administrative and technical supervision of staff, and the analysis of data to take appropriate measures for the control of shipping.
- Nautical assistant, who assessed data from the VTS equipment, processed it and, as necessary, made it available to the supervisor. The nautical assistant could only issue instructions with the authority of the nautical supervisor.

[14] Generaldirektion Wasserstraßen und Schifffahrt.

[15] International Convention for the Safety of Life at Sea, 1974, as amended.

Document VV-GDWS 24-2 identified the authority of the VTS within and without territorial seas in a table:

Sea area	***Measures***	***Fundamentals***
Sovereign territory	*Applies to all vessels:* *– provision of traffic information;* *– provision of traffic assistance;* *– implementation of traffic regulations / traffic management.*	*International Regulations for Preventing Collisions at Sea (COLREGs), Maritime Shipping Responsibilities Act, German Ordinance on the Regulations for Preventing Collisions at Sea, Traffic Regulations for German Waterways, Administrative Regulations, Ship Safety Ordinance*
High seas	*Applies to vessels flying the German flag:* *– provision of traffic information;* *– shipping police measures.* *Applies to all vessels:* *– provision of traffic information.*	*COLREGs, agreements with shipowners and partner states, IMO resolutions and conventions*

Document VV-GDWS 24-2 specified what information should be passed and how, specifically:

> *The traffic information, traffic assistance and orders issued by the VTS via federal employees for the control and regulation of traffic have a hierarchical relationship. Traffic assistance should only be provided and then, if necessary, regulations implemented if traffic information fails to achieve the desired objective.*
>
> *It should be noted that:*
>
> - *advice and warnings be communicated to the vessels in question in such good time as to enable them to take any action necessary to avert danger independently by liaising with each other directly and acting appropriately;*
>
> - *orders be issued in such good time as to enable vessels to prevent the traffic situation that needs to be avoided by altering the manner in which they are acting.*
>
> *If the assessment of the situation uncovers several instances of danger requiring simultaneous action by the VTS, the [nautical supervisor] shall prioritise them based on professional judgement, where the most urgent situation must be given priority. As far as practicable, warnings regarding other dangerous situations must be addressed to the ship's command concerned.*

And that:

> *If the analysis of the situational picture uncovers a need for action, the necessary steps must be taken proactively, based on professional judgement. It should be noted that conclusions must not be drawn from inadequate information (inadequate radar information, in particular).*

It also stated:

> *In principle, the ship's command decides upon the most appropriate way of complying with the orders*
>
> *In area in which the manoeuvring of vessels can no longer be analysed with regard to the desired outcome, the VTS may not intervene in the conduct of the vessel.* [sic]

And:

> *Irrespective of the above a warning may still be issued to ship's commands concerned.*

1.10.3 Traffic control operation

The VTS centre used a bespoke Airbus maritime system that fused radar contacts with AIS targets and overlaid them on an electronic chart. The system was configurable to display the working preferences of the operator. It would auto-generate warnings of vessels with a CPA of less than 0.5nm but, due to the number of alarms generated by smaller vessels, this function would be muted, although a warning remained visible on screen. VTS staff relied on their experience and local knowledge to identify which shipping situations required intervention rather than the alerts generated by the automated system. No formal guidance existed for the procedure to be followed once a CPA of concern was identified.

VTS communicated on multiple VHF channels, specifically using channel 79 and 80 for the German Bight TSS, channel 79 for the North Coast Traffic sector south of the TSS along the coast and the East Frisian Islands, channel 63 for Jade Traffic, and channel 16.

The centre was normally staffed with two nautical supervisors and three nautical assistants. Personnel were organised in two parts: an assistant and supervisor covered the Jade river region and a VTS supervisor and two VTS assistants covered the German Bight TSS (German Bight Western Approach, Terschelling-German Bight and Jade Approach) as well as the North Coast Traffic sector south of the TSS along the coast and the East Frisian Islands.

The working pattern was for three watches in a 24-hour period, specifically 0600 to 1400, 1400 to 2200 and 2200 to 0600. The established routine was for two early shifts, two late shifts, two nights shifts followed by a 'swing'[16] day and then 2 days stood down.

[16] A transitional shift to help operators adjust their body clocks from one type of work pattern to another.

Of the 30 supervisor and assistant positions required to maintain a 1 in 6 VTS watch bill, four (one supervisor and three assistants) were unfilled at the time of the accident. No on call system was maintained as in other VTS centres as staff cover would be sought on an opportunistic basis or from day workers. In the 7 days before 23 October, there had been at least one person missing per watch. On the night of the accident, the VTS assistant for the western part of the German Bight on VHF channel 79 was missing. Area coverage was maintained by the supervisor for German Bight and North Coast Traffic. Absences could also be caused by sickness and were not reported as being unusual by VTS staff, with local arrangements in place to effect cover. An escalation process was available and other qualified personnel working elsewhere within the VTS organisation could support absences at short notice.

1.10.4 Vessel traffic services personnel qualifications and training

The GDWS, as the competent authority, conformed to the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) requirements for VTS and its assistants and supervisors completed training to its VV-GDWS 24-2 standard. An IMO Member State audit of Germany in 2022 raised no findings and made no observations about VTS.

Following the accident, the GDWS declared that all the assistants and supervisors on duty at the time of the accident were appropriately qualified and had completed mandatory refresher training including, specifically, exercise VK02-K-GBT-De, which dealt with vessels at risk of collision without VTS intervention. The training complied with IMO Resolution A.1158(32), ensuring that VTS personnel provided timely and relevant information on factors that might influence ship movements and assist on board decision-making; monitored and managed ship traffic to ensure the safety and efficiency of ship movements; and responded to developing unsafe situations.

The VTS assistant and VTS supervisor on watch at the time of the accident were experienced mariners holding the equivalent of chief mate and command qualifications. Both were in date for refresher training that included a simulation exercise to resolve close quarters situations resulting in a risk of collision. The absence of an assistant was not uncommon and was managed on the night of the accident in line with existing VTS protocols.

1.10.5 Vessel traffic services post-collision internal report findings

The VTS authority investigated the actions of the VTS staff following the collision **(Annex A)**. The report indicated that all equipment was functioning correctly. The VTS authority's findings included:

- Experience showed that smaller vessels in the area, such as *Verity*, often gave way relatively late, needed less room to manoeuvre and were reluctant to deviate from set courses.

- VTS interacted with *Verity* when the range between vessels was 1.3nm and decreasing.

- At a range between vessels of 1nm VTS had no further chance to intervene, and it was content that earlier interaction had generated a solution to avoid a collision.

- On determining the likelihood of collision, VTS tried to force *Polesie* to *comply with traffic law and prevent the vessel turning to port (reaction to non-compliance to Rule 17.c)* and 'further interaction' was prohibited by section 24 of its document VV-WSV 2408, which stated that *in areas where ship manoeuvres can no longer be analysed with regard to the desired outcome, the traffic control centre may not intervene in driving the behaviour of the vessels*.

1.11 TRAFFIC SEPARATION SCHEME

A TSS is part of an IMO adopted ship routeing system designed to organise traffic using lanes to separate opposing flows of traffic and minimise the risk of collision. Routeing systems were defined in the IMO Ship's Routeing (2019) publication. By establishing clear routes for vessels, a TSS reduced the likelihood of accidents and helped vessels avoid hazardous areas, such as shallow waters, reefs, or areas with limited manoeuvring space. The IRPCS (also known as COLREGs[17]) included specific requirements, Rule 10, for vessels using a TSS.

A TSS separates opposing streams of traffic by establishing traffic lanes. These lanes are defined areas in which one-way traffic is established. Lanes may be separated by natural obstacles or separation zones. Separation zones between traffic lanes are marked on navigation charts in a light magenta colour.

Crossing and precautionary areas are not part of a TSS but can be associated with them as part of the IMO routeing measures. Rule 10 does not generally apply, but ships should navigate with caution when navigating in such areas. The crossing area between the Jade Approach and Terschelling-German Bight TSS's was not marked on Admiralty Chart DE2 INT1456 but it was identified by magenta hatching on electronic navigational charts DE4 N012M and DE4 012N loaded within *Polesie*'s ECDIS. The hatched area displayed on the charts contained a warning symbol that when interrogated showed the text *IMO adopted*. The same detail could be displayed, at the operator's discretion, on the VTS equipment.

1.12 DUPLEX VERY HIGH FREQUENCY RADIO

1.12.1 Very high frequency operating modes

Marine VHF operates in two distinct modes:

1. Simplex, where all stations transmit and receive on the same frequency (channel). All stations that have a particular channel selected will hear all radio traffic on that channel if within the range that the transceiver can detect other signals. Most marine VHF channels are simplex and are usually referred to as press-to-talk (PTT) systems, as the handset button needs to be pressed to transmit and released to hear a response.

2. Duplex, where the transmission and reception occur on different frequencies. This allows for continuous communication between users while the transmission button is pressed. Duplex usage allows for a level of privacy, less interference, and restricts the amount of audible traffic. A shore station on a duplex channel transmits to all ships in range but when the ship transmits it can only be heard at the shore station; other ships cannot hear

[17] The IRPCS/COLREGs provide mariners with a common set of rules that are reinforced at every level of deck officer training and certification. They form a key component of the STCW qualification process and as such ensure that mariners have the basic ruleset for a shared mental model when operating near other vessels.

the transmission. In practice, ship-to-shore interactions would follow the PTT protocol even on a duplex channel.

Where a VTS operates on a duplex channel, it can emulate a simplex system by using shore frequency retransmission stations for the received (ship) signal.

1.12.2 International Association for Marine Aids to Navigation and Lighthouse Authorities VTS Manual references to duplex communications

Both the 2021 and 2016 editions of the IALA VTS Manual omitted any reference to duplex VHF. The 2012, 2008 and 2002 editions stated that:

> *Communication between shore and participating vessels, using appropriate international VHF channels can take place on simplex, as well as duplex channels. In the case of duplex channels, re-transmission from the shore may need to be carried out if the information received is of interest to other vessels to enable them better to comprehend the traffic situation (in their vicinity – 2002).* [sic]

The 1993 edition used different phraseology:

> *…the VTS authority should make provisions for the retransmission of communications from vessels where duplex frequencies are in use.*

The use of retransmission facilities would result in a ship hearing the communications from both the VTS and the ships in the reception area. This would result in VTS and ships having the opportunity to build a shared mental model of the situation regarding traffic movements in their vicinity.

1.13 THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA, 1972, AS AMENDED

Both vessels were required to navigate in compliance with the IRPCS.

Justice Sheen in The Maloja II (1993)[18] said:

> *The structure of the Collision Regulations is designed to ensure that, wherever possible, ships will not reach a close-quarters situation in which there is risk of collision and in which decisions have to be taken without time for proper thought.*
>
> *Manoeuvres taken to avoid a close-quarters situation should be taken at a time when the responsible officer does not have to make a quick decision or a decision based on inadequate information. Those manoeuvres should be such as to be readily apparent to the other ship.*

The following IRPCS **(**the applicable rules are set out in full at **Annex B)** are particularly relevant to this accident and are summarised as follows:

- Rule 2 – Responsibility. This rule stated the responsibility of vessels and allowed a departure from the collision prevention regulations when following the rules will not avoid immediate danger. It referred to the ordinary practice of seafarers which, while undefined, alluded to that which a suitably trained and experienced person should know.

[18] Sheen, J. (1993) in the *Maloja II* (1993) 1 Lloyd's Rep. 48 at pp. 50col 2 to 51.

- Rule 5 – Lookout. This rule stated that a lookout should be kept by *all available means*, visual and electronic, to assess the situation and risk of collision.

- Rule 7 – Risk of Collision. This rule required that all means possible, including radar, should be used to assess if a risk of collision existed as early as possible. Risk of collision is primarily determined by monitoring the compass bearing of an approaching vessel. If it does not appreciably change then a risk of collision is deemed to exist.

- Rule 8 – Action to Avoid Collision. This rule required that any action taken to avoid a collision is positive, clear and made in ample time and with due regard to the observance of good seamanship. Such action should not result in another close quarters situation.

- Rule 10 – Traffic Separation Schemes. This rule specified the responsibilities between vessels operating in a TSS or near its terminations.

- Rule 15 – Crossing Situation. This rule specified that when two power-driven vessels are crossing each other, and there is risk of collision, the vessel that 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 Give-way Vessel. This rule specified that every vessel required to give way must take early and substantial action to keep well clear.

- Rule 17 – Action by Stand-on Vessel. This rule required that, where one of two vessels is to keep out of the way, the other vessel should maintain its course and speed (Rule 17(a)(i)). The stand-on vessel may take action (Rule 17(a)(ii)) to avoid collision as soon as it is apparent that the give-way vessel has not taken the required action. When taking such action, a stand-on vessel should try to avoid altering course to port for a vessel on its own port side (Rule 17(c)). Additionally, if the stand-on vessel finds that the action of the give-way vessel is insufficient, it shall take action to avoid a collision (Rule 17(b)).

- Rule 34 – Manoeuvring and Warning Signals. This rule required vessels in sight of one another to warn other vessels of their intended movement using sound and light signals.

1.14 OPERATOR GUIDANCE ON THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA, 1972, AS AMENDED

1.14.1 General

There are many publications and a considerable body of evidence that seek to address the application and situational implementation of the IRPCS. They are practical interpretations, analyses, or opinions of, generally, legal cases to assist practitioners in assessing correct courses of action in various circumstances. Ultimately, they do not provide definitive guidance, only a judicial or expert interpretation. A definitive position on the rules is often derived by the courts interpreting the IRPCS in a particular situation where attribution or levels of blame are sought. In reviewing numerous guidance publications and relevant case law the investigation determined that, in general, in the ordinary practice of seafarers, any action taken by the give-way vessel to avoid a collision should best be affected

at about 12 minutes before the anticipated point of collision (C-12)[19]; if crossing ahead then the CPA should not be less that one mile ahead but a 0.5nm CPA was acceptable if passing on reciprocal course or astern[20]. However, many factors including navigational constraints, traffic density, vessel manoeuvrability, speed, weather and visibility needed to be considered and these factors conspire to make exact definitions challenging.

On the action of the stand-on vessel in a crossing situation, the obligation to take action under Rule 17(b) is unlikely to arise before C-5[21] but this again may be dependent on the prevailing circumstances and conditions. Before taking any action under this rule the OOW should alert the give-way vessel by sounding the proscribed sound signal in Rule 34(d) and allow the give-way vessel time in which to respond. A reasonable time to make an appraisal would be about 3 minutes[22], which suggests the stand-on vessel should be taking action under Rule 17(a)(ii) sometime between C-8 and C-5 minutes.

The IRPCS are clear that action taken in any condition of visibility must be ample, made in good time and with due regard to the observance of good seamanship (Rule 8).

1.14.2 A Guide to the Collision Avoidance Rules (7th Edition)[23]

This guide used mainly legal case law to provide examples. Case law judgements, by necessity, apportioned blame that was not generally pertinent to safety investigations, but they provided a broad understanding of what was, and was not, considered to be acceptable action when complying with the IRPCS.

- Rule 7 – Risk of Collision. The guide provided expansion on the text of Rule 7 and the issue of distance:

  > *The question arises as to how far apart the vessels must be before risk of collision should be considered to exist and the obligation to keep course and speed first begins to apply to the privileged* [stand-on] *vessel.*

The distance issue was unresolved but the guide's text was supported by a diagram to illustrate the phases of a crossing encounter, and subsequent text attempted to add ranges to those phases **(Figure 16)**. Additionally, the issue of *all available means* in determining risk of collision discussed, among other things, the use of VHF and AIS. It noted that, while AIS was not recommended as the sole means to determine risk of collision, its information transmission time may be faster than the time needed to generate an accurate ARPA but was limited to the quality of data input on the ship it was fitted to. On VHF, it commented that:

> *…there is little doubt that the use of the radiotelephone* [VHF] *for the purpose of collision avoidance will be of increasing importance in the future.*

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[19] *Samco Europe* v *MSC Prestige* (2011). Available at https://caselaw.nationalarchives.gov.uk/ewhc/admlty/2011/1580?query=collision&court=ewhc%2Fadmlty and *Sun Cross* v *Rickmers Genoa* (2010) at https://caselaw.nationalarchives.gov.uk/ewhc/admlty/2010/1949?query=collision&court=ewhc%2Fadmlty

[20] *Sydney* v *MSC Apollo* (2022). Available at https://caselaw.nationalarchives.gov.uk/ewhc/admlty/2023/328?query=hanjin+madras

[21] *Mineral Dampier* v *Hanjin Madras* (2001) and *Topaz* v *Irapua* (2003).

[22] Nautical Challenge Ltd v Evergreen Marine (2022) EWHC 206 (Admlty). Available at https://caselaw.nationalarchives.gov.uk/ewhc/admlty/2022/206?query=Sheen+Majola+II&court=ewhc%2Fadmlty

[23] Cockroft, A.N., Lameijer, J.N.F. (2012). Butterworth-Heinemann.

Base image from A.N.Cockroft and J.N.F Lameijer

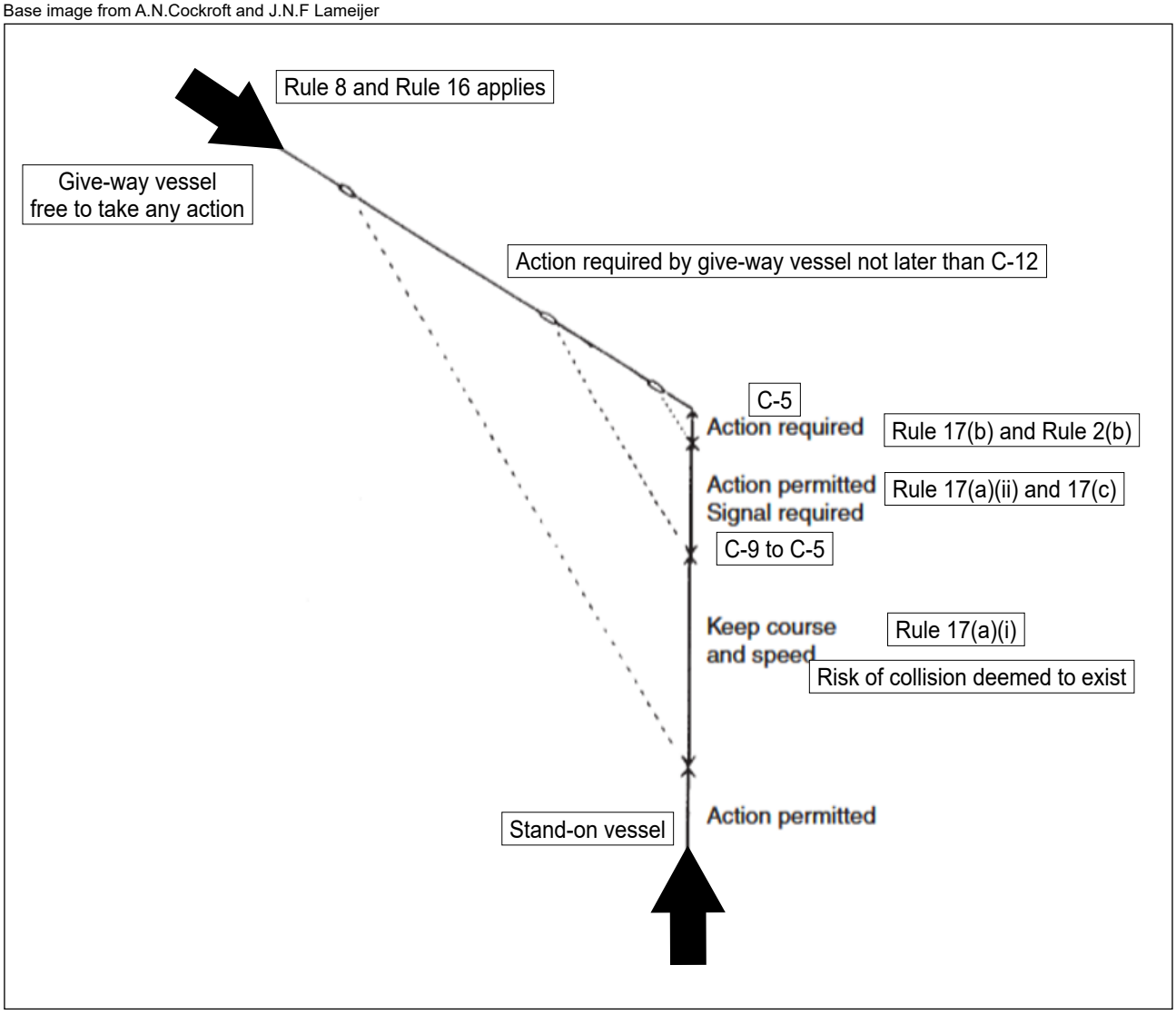

Figure 16: Suggested TCPA limits for open sea encounters; diagram adapted from *A Guide to the Collision Avoidance Rules*

- Rule 8 – Action to Avoid Collision. In commenting that the decision to take action should not be based on scant information, the guide provided examples for head-on encounters. It proposed that Rule 8(a) did not give a vessel, which was initially required to keep its course and speed, the right to take action at an early stage but only when the stand-on vessel was not taking appropriate action. It did not define 'early stage' nor did it propose distances or times when action would be required.

The issue of action taken to avoid a collision being 'large enough to be readily apparent' was addressed and it was noted that collisions frequently occurred when a series of small alterations of course were made, especially when radar was used. The requirement for 'substantial' action had been described in *The Billings Victory*[24] (and by advocates in the Admiralty Court ever since) as an obligation to act *handsomely, so as to leave the stand on vessel in no possible doubt as to what the give way vessel is doing*.

[24] Wilmer, J. (1949). 82, Lloyd's Law Reports 877, 881.

The guide discussed ‘alteration of course alone’ to avoid a collision and noted that:

> *The distance at which a close quarters situation*[25] *first applies will depend upon a number of factors, including the visibility.*

It proposed that 2 to 3 miles was the limit at which a close quarters situation was deemed to exist in restricted visibility but that for vessels in sight of one another 1 mile would probably be accepted.

- Rule 15 – Crossing Situation. In respect of Rule 15 the guide focused on narrow channels, traffic lanes, and hampered vessels[26]. When dealing with the requirement to avoid crossing ahead it stated that:

  > *The requirement to avoid crossing ahead only applies in a crossing situation in which there is risk of collision. It does not apply at long ranges, before risk of collision begins to apply, or to cases in which the bearing is appreciably changing. If there is a possibility of risk of collision the give-way vessel must avoid crossing ahead.*

  And:

  > *In a crossing situation a power-driven vessel is required to avoid crossing ahead of a power-driven vessel on her own starboard side, if there is risk of collision, but is not directed to cross astern. An alteration of course to starboard will usually be the best method of keeping out of the way of a vessel which is on the starboard bow, a reduction of speed or a substantial alteration of course to port would be preferable in order to avoid collision with a vessel approaching from near the starboard beam.*

- Rule 16 – Action by Give-way Vessel. The guide stated that:

  > *Any alteration of course or speed should be made in ample time and be large enough to be readily apparent to another vessel, action shall be such as to result in passing at a safe distance, the effectiveness of avoiding action must be checked and a give-way vessel should, if necessary, slacken her speed or take all way off.*

- Rule 17 – Action by Stand-on Vessel. The guide suggested that risk of collision did not apply at ‘long range’ and that a vessel that was required to keep its course and speed did not necessarily have to remain on the same compass course and maintain its speed. It quoted an historic case, before the 1972 IRPCS came into force, which determined that when a vessel was engaged on an ordinary and proper manoeuvre in the course of navigation, which would require an alteration of course and speed, the other vessel should take account of it.

  The guide further advised that a stand-on vessel was not specifically required to take action to avoid collision as soon as it became apparent that the give-way vessel was not taking appropriate action. The stand-on vessel was permitted to keep its course and speed until collision cannot be avoided by the give-way vessel alone.

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[25] A situation that arises when two or more vessels are so close that there is a risk of collision, and depends on the particular circumstances and closing speeds of the vessels involved.

[26] A vessel that is restricted in its ability to manoeuvre. This could be due to the nature of its work, or its draught and the vessel must display the appropriate lights or shapes.

It went on to state that:

> *However, the provision for permissive action places greater emphasis on the obligation of the stand-on vessel to continuously assess the situation when risk of collision exists…and, subsequently, to take action before collision becomes inevitable.*

The guide continued to expand on Rule 17 regarding the earliest moment for permitted action and suggested that in open sea conditions, if a give-way vessel approached within about 2 miles in a crossing situation, it may have delayed action too long, although this distance could vary based on vessel size, manoeuvrability, and rate of approach.

The guide's advice is supported, noting the vagaries of each case, by the courts. For the stand-on vessel in a crossing situation, the reported cases suggest that the obligation to take action under Rule 17(b) is unlikely to arise before C-5. In *Mineral Dampier* v *Hanjin Madras* the Court of Appeal noted it was common ground that Rule 17(b) would not apply until *after C-5 and probably not until C-4 or later*; while in *Topaz* v *Irapua* Mr Justice Gross accepted the advice of his nautical assessors and found that Rule 17(b) required *Topaz* to take action at about C-5.

The stand-on vessel may take avoiding action earlier under Rule 17(a) (ii) and will often be required to do so as a matter of good seamanship. However, before taking action under this rule, the OOW should first alert the give-way vessel by sounding the signal prescribed in Rule 34(d)[27], and then allow the give-way vessel a reasonable time in which to respond. A reasonable time would be in the order of 3 minutes or so, which suggests the stand-on vessel should be taking action under Rule 17(a)(ii) sometime between C-9 and C-5; this is consistent with the reported cases.

For example, in *Mineral Dampier* v *Hanjin Madras*, the Court of Appeal found that *Mineral Dampier* should have taken action under Rule 17(a)(ii) sometime after C-9 and at or before C-5; while in *Topaz* v *Irapua* Mr Justice Gross found that the *Topaz* should have taken action under this rule by the time the vessels were about 3 miles apart, at about C-10 to C-8. More recently, Mr Justice Teare accepted that *Samco Europe* was entitled to take action under this Rule at C-7.5.

1.15 BRIDGE WATCHKEEPING REGULATIONS AND GUIDANCE

1.15.1 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers

The STCW Convention was adopted in 1978, entered into force in 1984 and underwent major revisions in 1995 and 2010. It was supported by the STCW Code, which enlarged upon and explained the regulations in the Convention. Part A of the STCW Code was mandatory and Part B was recommended. Section A-VIII/Part 4.10 of the STCW Code mandated that:

> *The master of every ship is bound to ensure that watchkeeping arrangements are adequate for maintaining a safe navigational or cargo watch. Under the master's general direction, the officers of the navigational watch are responsible for navigating the ship safely during their periods of duty, when they will be particularly concerned with avoiding collision and stranding.*

[27] At least five short and rapid blasts on the whistle.

Table A-II/1 set out the requirements for 'operator level' competence (OOW) to maintain a safe navigational watch, which included:

> *Thorough knowledge of the content, application and intent of the International Regulations for Preventing Collisions at Sea, 1972, as amended.*

Table A-II/1 also required that to demonstrate competence a candidate must provide evidence of in-service experience (time at sea). The criteria for evaluating competence included knowledge of proper lookout principles, sound and light signals in the IRPCS, monitoring of traffic, and responsibility for the safe navigation of the vessel. The STCW Code set out similar requirements for the operation of radar, ECDIS and the ability to communicate with other ships and VTS stations using IMO Standard Marine Communication Phrases (SMCP).

Table A-II/2 set out the requirements for 'management level' competence (master and chief mate) to maintain a safe navigational watch, which repeated the requirements at operator level (OOW) for knowledge of the IRPCS and added:

> *Evaluation of navigational information derived from all sources, including radar and ARPA, in order to make command decisions for collision avoidance and for directing the safe navigation of the ship.*

Table A-II/2 also required that the evaluating criteria for competence included:

> *Action to avoid a close encounter or collision with another vessel is in accordance with the International Regulations for Preventing Collisions at Sea, 1972, as amended.*

Similar to the operator level (OOW) competences set out above, Table A-II/2 set competence criteria for masters and chief mates in passage planning and execution, and the use of ECDIS and radar.

1.15.2 Isle of Man Ship Registry and Bahamas Maritime Authority regulations

Both flag states were signatories to the STCW Code and to the IRPCS.

1.15.3 Bridge Procedures Guide

Since 1977, the International Chamber of Shipping has published a Bridge Procedures Guide (BPG) advising on safe bridge procedures and reflecting best practice in the commercial shipping industry. In the BPG Sixth Edition, published in 2022, section 4 *Duties of the Officer of the Watch* recommended several guiding principles, including:

> *The OOW should not be the sole look-out during hours of darkness.*
>
> *The Master should be called immediately if the OOW has any doubts about the safety of the ship or how to deal with the situation effectively.*

Section 4.16 of the BPG was devoted to compliance with the IRPCS. On light and sound signals, section 4.16.1 stated that:

> *The conduct of a ship's navigation should always comply with the COLREGS* [IRPCS]*. This includes displaying the correct lights and shapes, and making the correct sound and light signals.*

And

> *Safe navigation will therefore require the use of all available means to determine whether risk of collision exists…*

Section 4.16.2 stated that:

> *The OOW should use ECDIS and AIS to aid situational awareness but should not rely on either system for collision avoidance.*

And in a highlighted part of the section that:

> *Radar and ARPA are the primary electronic anti-collision aids for the OOW. The OOW should not rely on VHF radio or AIS for collision avoidance.*

On action to avoid collision, section 4.16.3 stated:

> *Early, substantial and positive action that is appropriate to the situation, seaman-like and readily apparent to other vessels should always be taken to avoid collision. Monitoring the effectiveness of an action should continue until the other vessel is finally past and clear.*

1.15.4 Use of very high frequency radio for collision avoidance

Several maritime administrations have advised mariners that VHF use to avoid a collision has the potential to introduce confusion due to situational misunderstanding, language difficulties, and where action in contravention of the IRPCS is agreed.

While not applicable in this case, the UK's MCA Marine Guidance Note (MGN) 324[28], which covered use of VHF in collision avoidance, advised that:

> *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.*
>
> *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.*

[28] MGN 324 (M+F) Amendment 2 navigation: watchkeeping safety – use of Very High Frequency (VHF) radio and Automatic Identification System (AIS).

1.16 VESSEL TRAFFIC SERVICES REGULATION AND GUIDANCE

1.16.1 International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended

The IMO stated in SOLAS Chapter V Regulation 12 – Safety of navigation, vessel traffic services that:

- *Vessel traffic services (VTS) contribute to 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.*

- *Contracting Governments undertake to arrange for the establishment of VTS where, in their opinion, the volume of traffic or the degree of risk justifies such services.*

- *Contracting Governments planning and implementing VTS shall, wherever possible, follow the guidelines developed by the Organization.*

1.16.2 Vessel traffic services outside of territorial seas

Paragraph 3 of SOLAS Chapter V Regulation 12 stated that:

> *The use of VTS may only be made mandatory in sea areas within the territorial seas of a coastal state.*

In Guideline 1089, Provision of a VTS, IALA clarified that:

> *Recognizing the contribution of VTS to the safety of navigation, improved efficiency of traffic flow and the protection of the marine environment, a VTS may be established beyond territorial seas either:*
>
> - *in association with an IMO adopted system; or*
>
> - *on the basis of voluntary participation.* [sic]

A VTS in international waters[29] may not exercise authority and can provide only information or advice to shipping.

1.16.3 General principles of the relationship between VTS and ships

Section 7.1 of the IMO's Resolution A.1158(32) Guidelines for Vessel Traffic Services stated:

> *Nothing in these guidelines changes the ultimate responsibility of the master for all aspects of the operation of the ship including responsibility for safe navigation.*

[29] The United Nations Convention on the Law of the Sea refers to international waters as 'the high seas' not under the jurisdiction of any country.

Section 6.1 of Resolution A.1158(32) stated:

In a VTS area participating ships should:

1. *provide reports or information required by VTS;*

2. *take into account the information provided, or advice and warnings issued, by VTS;*

3. *comply with the requirements and instructions given to the ship by VTS unless contradictory safety or marine environment protection reasons exist; and*

4. *report any pollution or dangers to navigations to VTS.*

1.16.4 International Association for Marine Aids to Navigation and Lighthouse Authorities standards

The IALA VTS Manual (Edition 8.2, published in 2022[30]) was a set of guidelines to support the implementation and operation of VTS. In particular, the manual provided guidance on:

- the regulatory and legal framework for implementing and operating VTS;
- the obligations of Contracting Governments and Flag States;
- IALA standards relating to the implementation and operation of VTS and their associated recommendations, guidelines, and model courses.

1.16.5 Vessel traffic services personnel training standard

The IMO Resolution A.1158(32) *Guidelines for Vessel Traffic Services* required that:

VTS personnel should only be considered competent when appropriately trained and qualified for their VTS duties. This includes:

1. *satisfactorily completing generic VTS training approved by a competent authority;*

2. *satisfactorily completing on-the-job training at the VTS where the personnel are employed;*

3. *undergoing periodic assessments and revalidation training to ensure competence is maintained; and*

4. *being in possession of appropriate certification.* [sic]

IALA produced two standards:

- C0103-1 – VTS Operator[31]
- C0103-2 – VTS Supervisor

[30] Updated editions 8.3 and 8.4 were published in 2024.

[31] German Bight VTS referred to this level as an assistant.

Both standards required training in responding to developing unsafe situations, and in IALA Guideline 1089 it was described that:

> *Responding to developing unsafe situations involves support to the navigational safety of the ship through the provision of essential navigational information to assist on board navigational decision-making. It may also involve the provision of navigational advice and/or instruction.*

Guideline 1089 gave examples of when VTS intervention was required under three headings related to the message markers *Advice*, *Warning*, and *Instruction*. The guideline noted that, for a VTS to give an instruction, *The VTS provider should give careful consideration to the authorization of VTS personnel for issuing an Instruction in developing unsafe situations*. [sic]

In Guideline 1027, Simulation in VTS Training, IALA set out requirements for simulation scenarios and the assessment of operators and supervisors. It described generic principles for the use of simulation to train and assess VTS personnel and that the following recommended simulated exercises should be considered for practical training:

Subject	Assessment criteria
Basic skills Monitoring and identification. Communication co-ordination. Evaluation and interpretation of the traffic situation. Log-keeping, recording and reporting	Ability to identify, correctly interpret and handle reports from five simulated vessels
Traffic interaction and conflict resolution Waterway management in multi-ship scenarios. Anticipation and projection of traffic patterns. Critical areas. Vessels overtaking and approaching each other. Passage plans, including those for deep draught vessels	Ability to identify, correctly interpret and deal with up to five simulated vessels in complex situations. Ability to prepare VTS sailing plans, to monitor their execution and amend them due to unforeseen circumstances
Emergencies and special situations Contingency plans. Adverse weather conditions. Special vessels and those with restricted manoeuvrability. Internal and external emergencies	Ability to identify, correctly interpret data and handle reports from 20 simulated vessels during emergencies and special situations

1.16.6 International Association for Marine Aids to Navigation and Lighthouse Authorities VTS voice communications standards

IALA issued Guideline 1132, VTS Voice Communications and Phraseology, to assist authorities in implementing practices to ensure VTS communications were harmonised using IMO SMCP to:

- facilitate clear, concise, and unambiguous communications that were timely and effective, and
- minimise misunderstanding of the intent of messages and reduce the time required for effective communication.

Guideline 1132 identified that cultural differences could cause differing responses to situations. In particular, it stated that:

> *When VTS personnel communicate cross-culturally special attention should be made to:*
>
> - *Share crucial information with ships to create a common perception of potential dangers, even if this information seems "obvious".*
> - *Use closed loop*[32] *(or Read-back) techniques when information may be misunderstood such as the number of persons on-board or information that would benefit others using the VTS area, instructions or advice.*

Guideline 1132 promoted the use of message markers designed to increase the effectiveness and urgency of VHF communications and to emphasise the content of the message or to ensure that the message will be properly understood. The use of message markers was not obligatory but their general use was deemed *good practice and VTS personnel should apply them depending on the assessment of the situation*. The use of message markers was *strongly recommended when a degree of stress or urgency existed, when there were language difficulties and when responding to unsafe situations*.

Eight message markers were to be used to preface the rest of a communication when there was a need for clarity, to stress a phrase, or for urgency. For example:

> ***INFORMATION**. Water level at breakwater is 4m.*
>
> ***ADVICE**. Reduce to safe speed.*
>
> ***WARNING**. You are approaching shallow water.*
>
> ***INSTRUCTION**. Remain West of No 1 Buoy until ship X has passed.*

The **INSTRUCTION** description advised that the message:

> *implies the intention of the sender to direct the action of others.*

[32] A communication technique used to avoid misunderstandings. The sender gives a message and the receiver repeats a received message, or an appropriate part thereof, back to the sender to obtain confirmation of correct reception.

In a VTS area, ships should comply with instructions given to the ship by a VTS unless contradictory safety and/or marine environment protection reasons exist. Masters may be required to report on their actions should they decide to disregard any instruction given by a VTS.

It is important, therefore, that when an instruction is issued by a VTS it has the appropriate regulatory status and authority to do so.

1.16.7 Specific guidelines on vessel traffic services management and operation

The IALA VTS Manual referenced several additional guidelines for aspects of management and operation.

Guideline 1141, Operational Procedures for Delivering VTS, provided a framework for authorities to implement processes and procedures associated with the provision of VTS. In section 5.1.7 it advised that procedures should be implemented for responding to developing unsafe situations that included, among others, a *vessel at risk of grounding or collision*.

1.16.8 Academic study on vessel traffic services communications

A study of Non-technical communication factors at the Vessel Traffic Services[33] explored *how VTS operators…communicated with ships and other actors in the maritime socio-technical system and how decisions were made regarding assisting traffic in maintaining safe passage in port areas, where most vessel movements are seen and accidents occur*.

VTS operators described how an element of the trust placed in seafarers was based on the quality of communication, and that perceived language difficulties weakened that trust. Ultimately, VTS operators were required to make a judgement and adapt their communication style accordingly.

The study identified that VTS operators should only intervene to a point after which it is prudent to cease communicating:

The VTS can ask questions to clarify the vessels' intentions, give a warning (e.g., "Warning: You are heading for shallow waters"), or even provide advice from a general perspective, but usually once vessels have reached an agreement as to how they will meet, the VTS is not to intervene. Moreover, the VTSOs can only assist traffic up to a certain point and will not interfere when accidents are just about to take place, as there is a point where VTS interference is thought to actually do more harm than good ("It's about two minutes until they will have their closest point of approach. Now, I would say it is too late for us in the VTS, because you always come through the limit where you do more harm than you will do good"; "If they are going to come a little bit close, then I know what their intentions are, so I am not that worried. But it is very difficult to say as well, because you can have a manoeuvre problem very soon"). [sic]

[33] Costa, N.A., Lundh, M., MacKinnon, S.N. (2017). Cogn Tech Work 20, 63–72 (2018). https://doi.org/10.1007/s10111-017-0448-9. Accessed 22 August 2025.

1.17 INTERNATIONAL ASSOCIATION FOR MARINE AIDS TO NAVIGATION AND LIGHTHOUSE AUTHORITIES

Established in 1957, IALA[34] was a non-governmental advisory body that gathered marine aids to navigation authorities, manufacturers, consultants, and scientific and training institutes from all parts of the world to work together harmonising marine aids to navigation. The work of its committees was aimed at developing common best practice through the publication of IALA standards, recommendations, guidelines and model courses.

1.18 EMERGENCY POSITION INDICATING RADIO BEACON PERFORMANCE STANDARDS

The annex to IMO Resolution MSC.471(101), on performance standards for float-free EPIRBS, adopted on 14 June 2019, recommended that:

> *2.2 The EPIRB should be of an automatic float-free type. The equipment, mounting and releasing arrangements should be reliable, and should operate satisfactorily under the most extreme conditions likely to be met with at sea.*

And included at 2.3.1 a specification for immersion to:

> *be so designed that the electrical portions are watertight at a depth of 10 m for at least 5 min.*

And included at 2.6.3, that the EPIRB should:

> *be designed to release itself and float free before reaching a depth of 4 m at a list or trim of any angle.*

1.19 VOYAGE DATA RECORDERS

SOLAS Chapter V Regulation 20 required that passenger ships, and ships other than passenger ships of 3,000gt and upwards, constructed on or after 1 July 2002 must carry VDRs to assist in accident investigations, under regulations adopted in 2000 that entered into force on 1 July 2002. Performance standards for VDRs were adopted in 1997 and gave details on data to be recorded and VDR specifications. *Verity* was 2,601gt and was not required to be fitted with a VDR (see section 1.2).

The MAIB has records of 14,447 accidents involving ships of 500gt or more between 2002 and 2022. Of these, 1,002 were very serious or serious marine casualties that required formal investigation to varying degrees. **Table 3** summarises the accidents in relation to ships that were required to be equipped with a VDR (3,000gt or more) and those that were not (500gt to 2,999gt). The table shows that, in broad terms, a third of all casualty vessels that required investigation were not required to be equipped with a VDR.

[34] Effective 22 August 2024, IALA changed its status from a non-governmental organisation to an intergovernmental organisation. The new organisation was named the International Organization for Marine Aids to Navigation.

Ship size (gt)	Very Serious Marine Casualty	Serious Marine Casualty
500 to 2,999	45	294
3,000+	118	545

Table 3: Statistics for marine casualties between 2002 and 2022

The investigations into the loss of the general cargo vessel *Swanland* in 2011 that resulted in 6 fatalities (MAIB report 12/2013[35]) and the cement carrier *Cemfjord* in 2015 that resulted in 8 fatalities (MAIB report 8/2016[36]) were also hindered by insufficient data as neither vessel was equipped with a VDR.

1.20 PREVIOUS ACCIDENTS

1.20.1 *Ever Smart* and *Alexandra 1* – collision

On 11 February 2015, the container ship *Ever Smart* collided with the oil tanker *Alexandra 1* near the entrance to the buoyed approach channel in Jebel Ali, United Arab Emirates. The container ship was outbound at a speed of 12kts and had disembarked its pilot. The tanker was inbound and was moving very slowly ahead while waiting for the pilot from the container ship to board. Both vessels suffered major structural damage to their bows but there were no injuries and there was no pollution.

The investigation (MAIB report 28/2015[37]) identified that the collision resulted from several factors. In particular, *Ever Smart*'s bridge team did not keep a proper lookout or monitor the tanker's movement. They only realised that *Alexandra 1* was close ahead when alerted by the port control seconds before the collision. Additionally, the accident occurred within Jebel Ali's port limits. The precautions of pilotage and the port's VTS, which would normally coordinate and deconflict the movements of vessels in the port area, were ineffective on this occasion.

1.20.2 *Paula C* and *Darya Gayatri* – collision

On 11 December 2013, the general cargo vessel *Paula C* and the bulk carrier *Darya Gayatri* collided in the south-west lane of the Dover Strait Traffic Separation Scheme. Both vessels were damaged but there were no injuries and there was no pollution. The collision occurred as a result of *Paula C* turning into the path of *Darya Gayatri* after the action taken by the general cargo ship's OOW to avoid a nearby fishing trawler had not gone as intended.

[35] https://www.gov.uk/maib-reports/structural-failure-of-general-cargo-vessel-swanland-in-the-irish-sea-resulting-in-the-vessel-sinking-with-loss-of-6-lives

[36] https://www.gov.uk/maib-reports/capsize-and-sinking-of-cement-carrier-cemfjord-with-loss-of-8-lives

[37] https://www.gov.uk/maib-reports/collision-between-container-vessel-ever-smart-and-oil-tanker-alexandra-1

The investigation (MAIB report 25/2014[38]) identified several contributory factors including:

- *Paula C*'s OOW did not effectively use the electronic aids available to maintain a proper lookout. After taking action to avoid the fishing vessel, the OOW was uncertain as to what action to take next and lost situational awareness.

- A VHF radio intervention by Dover Coastguard [VTS] was timely and well-intended but, inadvertently, almost certainly influenced *Paula C*'s OOW into taking action, which resulted in *Paula C* turning towards *Darya Gayatri*.

The investigation made no recommendations based on the actions of the shipping companies and the VTS authority, which had:

- Reminded all VTS operators of the requirement to make use of the approved vocabulary contained in the local instructions and SMCP.

- Initiated a series of VTS based exercises conducted on a regular basis by all watches to ensure that VTS operators were exposed to a range of simulated situations. And

- Implemented a system to review all VTS incidents and hazardous occurrences.

1.20.3 *Coral Ivory* and *Siderfly* – collision

On 28 October 2013, the Netherlands registered liquid petroleum gas tanker *Coral Ivory* collided with the St Vincent and the Grenadines registered cargo ship *Siderfly* in the Kiel Canal. Neither vessel was lost, with only minor damage sustained by *Coral Ivory*, but *Siderfly* was put at risk of foundering due to damage below the waterline. The Kiel Canal was closed for 3 days while the *Siderfly* was secured alongside and stabilised. The resultant BSU investigation (BSU report 330/13) made a recommendation to the German Directorate General for Waterways and Shipping to examine the possibility of changing duplex VTS-to-ship channels to simplex channels.

[38] https://www.gov.uk/maib-reports/collision-between-general-cargo-vessel-paula-c-and-bulk-carrier-darya-gayatri-in-the-dover-strait-off-the-south-east-coast-of-england

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

The actions of both vessels to avoid a collision, and the interventions of VTS, all contributed to the collision. That *Verity* was damaged to the extent that it sank in about 5 minutes was significant as this did not allow the crew time to prepare for abandonment or deploy lifesaving appliances and was the reason for the loss of most of its crew.

Key human element evidence was not gathered due to the restrictions placed on the investigating state, the mental health of some of the witnesses, the deaths of *Verity*'s C/O and master, the limited information from the German authorities responsible for VTS operations, and the absence of VDR data from *Verity*. However, the extensive support given by BSU and BMA allowed for those limitations to be minimised as far as practicable.

The analysis examines the circumstances leading to the collision as follows:

- While the motivations of the OOWs involved cannot be known, the application of the relevant IRPCS is analysed to determine where deviations occurred, whether they were appropriate and whether the rules themselves gave rise to ambiguity.

- The effect that German Bight VTS had on the course of events, including its use of a Duplex VHF channel.

Other analysis sections will examine the collision damage and its effect on *Verity*, VTS authority, SAR operations, and VDR requirements.

2.3 FATIGUE

There is no evidence that any of the crews of either ship, or staff at the VTS, were suffering from fatigue and it is therefore not considered a significant contributing factor to this accident.

Both vessels had spent over 5 days in port and the crews had opportunity to rest; however, the watchkeeping schedules both ashore and on board at the time of the collision coinciding with circadian low[39], and uncertainty about the quality of individuals' previous rest, mean that fatigue cannot be fully discounted.

The VTS staff were in an established working routine that relied on flexibility of the team to cover absences. The VTS staff were likely to be acclimatised to the regime, but it has not been possible to determine if any other factors impacted on their performance.

[39] This period typically occurs between the hours of 0300 and 0500 and is commonly referred to as the window of circadian low. Further information can be found at https://www.sleepfoundation.org/circadian-rhythm

2.4 APPLICATION OF THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA, 1972, AS AMENDED

This section of the analysis has two main purposes. First, to determine the extent to which the vessels involved were adhering to the IRPCS. Second, to assess whether the IRPCS themselves were deficient or were open to ambiguous interpretation as to their application such that they could have contributed to the collision.

2.4.1 Rule 5 – Lookout

Rules 5 required every vessel to maintain a proper lookout at all times so as to make a full appraisal of the situation and the risk of collision

It is unknown if either vessel had an additional lookout on the bridge during the hours of darkness, in line with STCW.6/Circ.1 Annex, Section A-VIII/2 Part 3-1 paragraph 13, the BPG and each vessel's respective SMS. However, visibility was generally good, reducing in rain, *Verity* and *Polesie* were painting well on radar and both were transmitting AIS. *Polesie*'s VDR showed *Verity*'s AIS information was available from 0410 but not observed due to the settings on ECDIS and radar. It cannot be known whether the absence of additional lookouts significantly delayed either vessel's OOW from detecting the other vessel. However, the absence of lookouts deprived both OOWs of additional resource and might have influenced their decisions to alter course using autopilot instead of switching to manual steering and tasking the lookout to take the helm.

Evidence from accident investigations indicates that the absence of lookouts at night was a frequent occurrence. While on passage in open waters, closing up a lookout during the hours of darkness might appear unnecessary and a waste of resources. However, lookouts can be key to detecting the presence of other vessels and, in tense situations when a risk of collision exists and action is required, their presence can provide the additional capacity that makes the difference between a safe passing and a collision.

2.4.2 Rule 6 – Safe Speed

Rule 6 required vessels to proceed at a safe speed so they can take proper and effective avoiding action and be stopped within an appropriate distance.

Once *Verity* and *Polesie* had left port and dropped their pilots, they started sea passage at 8kts and 11kts respectively. In both cases, the passage speeds selected were below the vessels' maximum sea speed and analysis shows that both vessels had ample time to reach their destination ports. The visibility was generally good, though reducing in intermittent rain, and although both vessels were entering the German Bight TSS and approaching a precautionary area, traffic levels were light. As *Verity* and *Polesie* entered the German Bight TSS, they appeared to be travelling at a safe speed for the prevailing conditions.

2.4.3 Rule 7 – Risk of Collision

Rule 7 required every vessel to use all available means appropriate to determine whether a risk of collision exists, and that proper use shall be made of radar equipment, including long-range scanning to obtain early warning of risk of collision.

At 0423, as *Verity* entered the northbound section of the German Bight TSS, *Polesie* was on a steady course of 273° at 11kts and the vessel's AIS showed *Verity* on a nearly steady bearing of 226° with a CPA of 0.19nm and a TCPA of 26 minutes and 5 seconds. Analysis shows that thereafter, despite the course alterations by both vessels, their predicted CPA did not exceed 0.53nm at any time until the collision.

The IRPCS do not stipulate what constitutes a 'safe passing distance' as the prevailing circumstances and conditions will vary from one interaction to another. However, court judgements have been used to provide useful generic guidance on minimum safe passing distances of 1nm when passing ahead or 0.5nm when passing on reciprocal courses (see footnote 16 and section 1.14.1). From when *Verity* and *Polesie* entered the German Bight TSS until the collision, at no time did the CPA between the two vessels become large enough to exceed the minimum acceptable passing distances derived from previous court judgements.

The first solid evidence that a risk of collision between *Verity* and *Polesie* had been identified was the VHF call between the VTS assistant and *Verity*'s OOW at 0450:09 when the vessels were 1.3nm apart with a TCPA of 7 minutes and 20 seconds, when the VTS assistant voiced concerns about the "*very small CPA*". From that call, it can be deduced that *Verity*'s OOW had already identified the presence of *Polesie* and had formed a plan to pass ahead of the other vessel. Due to *Verity*'s loss with the death of the OOW and any on watch AB/lookout, and that the vessel was not required to be fitted with a VDR, it is not possible to determine when the OOW became aware of *Polesie* nor whether the CPA of the two vessels was being actively monitored.

Polesie's VDR shows that the OOW was very passive in their monitoring of other traffic in the vicinity. Figure 4 shows that at 0419 the only vessel being tracked was *Iona*, and it was not until after the VTS assistant's first call to *Polesie*, which completed at about 0452, that the OOW selected *Verity*'s AIS icon on the radar. At that time, *Verity*'s range was 0.83nm with a CPA of 0.2nm ahead of Polesie in 2 minutes and 33 seconds. While *Polesie*'s OOW might have been aware of *Verity* for some time before the VTS assistant's first intervention, they were not using the ARPA to provide them with accurate information about *Verity*'s CPA or TCPA and so were denying themselves the best information available.

2.4.4 Rule 8 – Action to Avoid Collision

Rule 8 required that action to avoid collisions be taken in line with the rules and, if possible, shall be positive, made in ample time and with due regard to the observance of good seamanship. Alterations of course should, if possible, be large enough to be readily apparent to another vessel observing visually or by radar, and a succession of small alterations of course and speed should be avoided.

Evidence from *Polesie*'s VDR, and extrapolated from *Verity*'s AIS track, indicates that each vessel's OOW was altering course in small increments using autopilot with limited rates of turn. While alterations of course using autopilot are commonplace in open waters, for a turn to be readily observable to another vessel it needs to be continuous and conducted using an appropriately positive rudder angle. Further, the practice of altering in small increments requires the OOW of the vessel altering course to focus on the turn ready to apply the next incremental correction before the vessel has steadied on course. This can distract them from monitoring the effectiveness of the turn and the movements of the vessel being avoided.

That the course alterations made during the interaction between *Verity* and *Polesie* were apparently made in small increments denied the observers afloat and ashore early evidence that actions were being taken to avoid a collision, thus affecting their decision-making, and likely distracted the OOWs conducting the turns from fully monitoring the situation. Additionally, periods of inaction before turning can be evaluated as the respective watchkeepers assessing the situation and processing information before acting.

2.4.5 Rule 15 – Crossing Situation and Rule 16 – Action by Give-way Vessel

Rule 15 was explicit that *the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel*. The investigation did not identify any circumstances that might justify a departure from the rules, such as other traffic or navigational hazard, so *Verity* was obligated to comply with Rule 15 and keep out of *Polesie*'s way.

Rule 16 required the give-way vessel (*Verity*) to take early and substantial action to keep well clear of the other vessel (*Polesie*).

Verity's options included a reduction in speed if the engines were available for immediate manoeuvre; entry into the traffic separation zone at an appropriate angle; or a bold alteration to port, if made in ample time.

From entering the northbound section of the German Bight TSS, *Verity* maintained a steady heading of 335° at 8.3kts for almost 8nm until 0451:04 when advised by the VTS assistant to take action to avoid a collision. The only insight into the OOW's appreciation of the developing risk of collision with *Polesie* during this period is derived from their answer to the VTS assistant's earlier question about their intentions. The transcript of that conversation is inexact **(**see **Table 1)**, but *Verity*'s OOW made clear that their intention was to maintain course and speed so *Polesie*, which was expected to alter course to port, would pass astern. *Verity* was positioned to the eastern side of the lane close to the boundary of the separation zone for passage along the TSS. While appropriate for narrow channels, this is not a necessity for TSS traffic lanes[40]. It is unknown if this positioning, adjacent to the separation zone, had an influence on the OOW's decision-making.

Had *Polesie* altered course to follow the line of the westbound lane of the TSS, as *Verity*'s OOW might have expected, *Verity* could have passed 0.7nm ahead of *Polesie*. As *Verity* was proceeding at a speed of just 8.3kts, this would still have left little margin for error and would have resulted in a close quarters situation.

Notwithstanding *Verity*'s OOW's expectations, *Polesie* did not alter course to port to follow the TSS for some time, during which the two vessels continued to close on a near steady bearing. It was not until reminded of the IRPCS by the VTS assistant that *Verity*'s OOW revised their plan and indicated an intention to turn to starboard and pass behind *Polesie*.

While *Verity*'s OOW's motivation to pass ahead of *Polesie* cannot be known, *Verity* passing ahead of the larger, faster *Polesie* would not have resulted in a safe passing distance nor was it in line with IRPCS Rule 15. Further, the plan to pass ahead became increasingly risky as the two vessels closed each other and, even if successful, would have resulted in a close-quarters situation. What is known is that

[40] See Vallance, K. (2013), page 23. *Rule 10 TSS: Traffic Separation Schemes*.

smaller vessels transiting this area often alter course late, prefer to keep their course and speed, are almost reluctant to take bold alterations and are more accepting of close passes.

Both vessels' crews could have been assessing the impact of *Iona* on their courses of action: *Verity* from the perspective that an alteration to starboard might result in another close quarters situation; and *Polesie* for the effect an alteration to port to regain planned track might have on their duties as the overtaking vessel to remain clear[41].

Following the VTS assistant's intervention, *Verity*'s subsequent alteration of course did not show on AIS for another 56 seconds. *Polesie* had recently altered to port and seen from *Verity* the bearing of *Polesie* was continuing to move aft relative to *Verity*, so it seems likely that *Verity*'s OOW was deciding whether it was possible to turn in time to pass *Polesie* port-to-port. However, the longer the OOW deliberated, the riskier a course alteration to starboard became. Even so, without the OOW's account their reasoning cannot be known.

By accepting a close crossing distance ahead of *Polesie* instead of taking positive action in good time to avoid a collision, *Verity*'s OOW set the conditions that triggered the VTS assistant to intervene. Following that intervention, *Verity*'s late turn to starboard was both slow and ineffective as a collision avoidance manoeuvre and it would likely have created uncertainty for both the VTS assistant and *Polesie*'s OOW.

2.4.6 Rule 17(a)(ii) – Action by Stand-on Vessel

Rule 17(a)(i) required the stand-on vessel to keep its course and speed, but Rule 17(a)(ii) permitted it to take action to avoid a collision if it appeared the give-way vessel was not taking appropriate action.

By not following the passage plan and overshooting its waypoint, where a course alteration to port was required to follow the planned track of 256° through the TSS, *Polesie*'s OOW created the need for a decision. Specifically, whether to: *proceed in…the general direction of traffic flow.*.. (Rule 10(b)(i)), which would have required *Polesie* to turn towards *Verity*; or, for *Polesie* to *keep her course and speed* as required by Rule 17(a)(i) and move out of the TSS. *Polesie*'s OOW has not provided a reason for the delayed alteration of course to port but, by deciding to turn at 0448, when the two vessels were only 1.5nm apart, the OOW was neither complying with the requirement to maintain course and speed nor adhering to the Rule 17(c) restriction that the stand-on vessel should *not alter course to port for a vessel on her own port side*. Given that *Polesie*'s OOW felt the turn to port was necessary, a call to *Verity* on VHF to notify the latter's OOW of their intentions would have been appropriate in the circumstances. While *Verity* was at the limits of audible range, the appropriate sound signal should also have been made.

Polesie's 28° turn to port (from 273° to 245°) was conducted incrementally using the autopilot, so the turn was not immediately evident to observers either afloat in other vessels or ashore in the VTS centre.

[41] At 0422, *Iona* was 1.4nm astern of *Polesie* and proceeding at a slightly lower speed of 10.9kts so *Polesie* could be considered to have completed overtaking. However, an alteration of course to port by *Polesie* to regain track might have resulted in another close quarters situation with *Iona*.

Polesie's alteration of course to port starting at 0448 did not comply with IRPCS Rule 17(a)(i), its incremental nature resulted in the VTS assistant possibly not realising that *Polesie* was under helm, and it introduced ambiguity as to which vessel was taking action to resolve the close-quarters situation. This resulted in a situation that was extremely dynamic and difficult to predict.

2.4.7 Rule 17(b) – Action by Stand-on Vessel

Rule 17(b) required the stand-on vessel to *take such action as will best aid to avoid collision* when collision cannot be avoided by the action of the give-way vessel alone.

Although the VTS assistant informed *Polesie*'s OOW that *Verity* would turn to starboard and pass behind *Polesie*, post-event analysis shows that *Verity* was turning directly into the path of *Polesie*, though *Verity*'s rate of turn appeared to diminish after its heading had altered between 50° to 60° to starboard of the original course. It would likely have been evident to *Polesie*'s OOW that *Verity*'s actions alone would have been insufficient to avoid a collision, and that immediate action was required. In the situation, those options included a turn to starboard, an emergency stop, or a turn to port.

At 0452:55, when *Polesie*'s OOW decided on a turn to port, *Verity* would have appeared on *Polesie*'s port bow but moving slowly from left to right when looking ahead from *Polesie*'s bridge. *Polesie*'s OOW might therefore have reasoned that a turn to port would have been the quickest way to increase the rate of bearing movement and thus CPA, and that there was minimal risk of *Verity* turning into *Polesie*. It is unknown if this action was fully recognised by VTS or if the turn to port confused its understanding of a situation as *Polesie*'s OOW had earlier mentioned a turn further to starboard.

Unlike Rule 17(c), which restrained a stand-on vessel that is acting in compliance with Rule 17(a)(ii) from altering to port, Rule 17(b) permitted the stand-on vessel to *take such action as will best avoid a collision*, and in the circumstances *Polesie*'s turn to port would likely have been effective at creating a greater CPA than that which existed if *Verity* had maintained its heading.

Post-accident analysis indicates that at 0452:55, when *Polesie*'s OOW started altering the vessel's heading further to port, *Polesie* could have turned inside and away from *Verity* and a collision could have been avoided. However, *Polesie*'s turn to port would have been more effective and clearer to those observing had the OOW selected hand-steering and put the wheel hard over instead of altering course in increments using the autopilot. Switching on an additional steering pump would have also increased the speed of the response.

2.4.8 Summary

Analysis of the application of the IRPCS by the OOW on both *Verity* and *Polesie* indicates significant shortcomings. Specifically, each OOW was willing to accept inappropriately close passing distances given that their room for manoeuvre was not overly constrained by navigational hazards or limited by other traffic. While the use of VHF for collision avoidance is discouraged, an early discussion between each OOW to clarify intentions would have helped avoid the later ambiguity as to the other vessel's actions. When actions were eventually taken to avoid a collision, they were neither positive, so as to be readily apparent to other observers, nor made in ample time.

In summary, while the application of the IRPCS was deficient, this investigation has found nothing to indicate the need to review or amend the current Rules.

2.5 VESSEL TRAFFIC SERVICES

2.5.1 First intervention

Document VV-WSV 2408 stipulated that VTS *advice and warnings be communicated to the vessels in question in such good time as to enable them to take any action necessary to avert danger independently by liaising with each other directly*. No specific guidance was provided to VTS staff regarding acceptable CPA distances. UK case law references suggest that the give-way vessel should be taking avoiding action in open waters at least 12 minutes or more before collision, and that if the TCPA reduces below 12 minutes a close quarters situation can be deemed to exist. Both vessels possessed sufficient manoeuvrability to effect collision avoidance at this range.

By 0450, when *Verity* and *Polesie* were on an apparently steady bearing, 1.3nm apart and with a CPA of 160m in 8 minutes and 11 seconds, the VTS assistant covering the section of the TSS became sufficiently concerned about the risk of collision to intervene. The VTS report **(Annex A)** does not explain why the intervention did not occur until TCPA was 7 minutes and 28 seconds. As the *Ever Smart* and *Alexandra 1* collision (see section 1.20.1) shows, late alerting by VTS can give vessels that have not detected each other very little time to react. During the exchange with *Verity* the VTS assistant noted the very small CPA, ascertained the OOW's intentions and reminded the OOW of the obligation on *Verity* to act to avoid a collision. In response, *Verity*'s OOW stated an intention to change course to starboard and pass aft of *Polesie*, and the VTS assistant undertook to notify *Polesie*'s OOW of that intention.

While the VHF exchange was clear and apparently understood by both parties, given the proximity of the two vessels and their TCPA the use of the IALA VTS 'Warning' message marker by the VTS assistant would have been appropriate and it might have prompted each OOW to take swift and positive action.

When the VTS assistant first called *Verity* they were likely concentrating on the two vessels showing on their display but probably had not noticed that *Polesie* had already altered course to port and was continuing to turn; had they done so, the VTS assistant's intervention might have been differently framed as that course alteration reduced the CPA between the two vessels from 245m to 86m. That *Polesie*'s turn went unobserved by the VTS assistant is a potential indicator of the time it takes for an alteration of course or speed by a vessel to be detected and understood by a remote operator observing a radar display or AIS readout.

The subsequent conversation between the VTS assistant and *Polesie*'s OOW was necessary because VTS was being conducted on a duplex radio circuit and the replies from *Verity* would not have been heard on board *Polesie*. The delay in *Polesie*'s OOW hearing *Verity*'s intended alteration to starboard was only one minute, but as the TCPA was under 5 minutes that delay eroded valuable time when action to avoid a collision could have been taken.

As discussed above, and as found in the *Paula C* and *Darya Gayatri* collision (see section 1.20.2), given the vessels' proximity, the use of the 'Warning' message marker by the VTSO would have been appropriate. Further, had the VTS assistant prefixed their transmissions with the message marker they might not have let the vague response of "*Yes, I will be looking and be a little to starboard*" by *Polesie*'s OOW pass without challenge. *Polesie*'s OOW's response did not meet the closed-loop standard recommended in IALA Guideline 1132, VTS Voice Communications and Phraseology, which recommended the recipient repeat back the message to confirm understanding.

The VTS assistant's intervention demonstrated active monitoring of traffic but it was relatively late and did not include IALA's 'Warning' message marker to stimulate action. That VTS was being conducted on a duplex channel resulted in delays in achieving common awareness and understanding while the VTS assistant relayed messages between the two vessels.

2.5.2 Second intervention

Document VV-WSV 2408 stipulated that VTS *orders should be issued in such good time as to enable vessels to prevent the traffic situation that needs to be avoided by altering the manner in which they are acting*. It also stipulated that VTS should not intervene in the conduct of vessels if their manoeuvring could no longer be analysed with regard to the outcome.

At 0452:55, *Polesie*'s OOW turned the vessel further to port. Post-event track analysis shows that *Polesie*'s CPA with *Verity* continued to reduce until *Polesie*'s rate of turn increased and by 0454:23 the CPA had reached 0.04nm. However, at 0453:43, after *Polesie* had started turning to port, the VTS supervisor called *Polesie*'s OOW on duplex VHF channel 80 and, having established contact, at 0454:00 used an elevated and urgent tone of voice to instruct, "*Do not come to port side, do not come to port side, come to starboard side Polesie, alter your course to starboard side*"; the OOW responded, "*Yes, to starboard*". Nine seconds later, with *Verity* at a range of 0.4nm right ahead of *Polesie* and still altering slowly to starboard, *Polesie*'s OOW switched to manual steering and put the rudder hard to starboard. Post-accident reconstruction indicates that *Verity* started turning to port at the same time but this alteration might not have been immediately apparent to VTS.

It took 23 seconds for *Polesie*'s turn to port to stop and the vessel to start turning to starboard, and 54 seconds later *Polesie* collided with *Verity*'s starboard side. Post-accident reconstruction shows that, had *Polesie*'s OOW continued the port turn instead of altering course hard to starboard as instructed by the VTS supervisor, the two vessels would not have collided and would have had a CPA in excess of 0.04nm.

The report of the accident from VTS **(Annex A)** recorded that when the VTS supervisor called *Polesie* and instructed the vessel to alter course to starboard the supervisor was applying IRPCS Rule 17(c):

> *A power-driven vessel which takes action in a crossing situation in accordance with subparagraph (a)(ii) of this Rule to avoid collision with another power-driven vessel shall, if the circumstances of the case admit, not alter course to port for a vessel on her own port side.*

However, as discussed in section 2.4.7, *Polesie*'s OOW was likely taking the action they assessed would best avoid a collision in line with Rule 17(b), and in that event the Rule 17(c) restriction did not apply.

Document VV-GDWS 24-2, supported by the *Non-technical communication factors at the Vessel Traffic Services* study, strongly indicated that when vessels are close to each other VTS intervention can be counterproductive. The delay between actions taken at sea becoming discernible on VTS displays is discussed above (see section 2.5.1). When the VTS supervisor intervened, they had detected that *Polesie* had commenced a turn to port, but not that *Verity*'s rate of turn had slowed, nor could they anticipate that the CPA between the two vessels was about to increase as *Polesie*'s rate of turn to port increased. While the VTS supervisor's intervention was well intentioned, document VV-WSV 2408 with VV-GDWS 24-2 did not provide guidance on the minimum CPA or TCPA at which VTS intervention was likely to be counterproductive and would not achieve the intended outcome.

Polesie's OOW had decided to alter course to port to avoid collision with *Verity*, and their change of mind to instead alter course hard to starboard proved catastrophic. Although it was night, the visibility was good, and *Polesie*'s OOW would have been able to see, as the rate of turn to port increased, that *Verity* would pass close but clear to the north. The OOW has not provided an explanation why they changed their mind, and the investigation has concluded that the OOW felt compelled to obey the VTS supervisor's instruction.

The VTS supervisor's intervention started at C-2 minutes and 44 seconds before an indicated CPA of 0.09nm and concluded less than 90 seconds before collision. As discussed in the *Non-technical communication factors at the Vessel Traffic Services* study paper, interventions proximate to small CPAs are ill-advised as they might add confusion and vessels are unlikely to be able to process the information received and respond quickly enough to achieve the outcome intended by the instruction.

In this accident, the VTS supervisor's instruction to *Polesie*'s OOW was given when the vessels were so close that VTS intervention was counterproductive. Further, it did not allow time to resolve whether avoiding action under IRPCS Rule 17(c) or 17(b) was appropriate. However, the instruction was sufficiently forceful to cause *Polesie*'s OOW to comply.

2.5.3 Duplex very high frequency channel

Organisations often choose to use duplex VHF channels to reduce over-talking and information being lost. However, during this accident the use of a duplex circuit directly impacted each OOW's awareness of the rapidly developing situation as crucial time was lost while the VTS assistant relayed the sense of a transmission they had received from one vessel to the OOW of the other.

The use of a duplex circuit for VTS operations was inconsistent with the advice in document VV-GDWS 24-2 that *advice and warnings be communicated to the vessels in question in such good time as to enable them to take any action necessary to avert danger independently by liaising with each other directly*. Vessels could not liaise directly on duplex VHF channel 80, and to communicate with each other a switch to a working VHF channel would need to have been agreed to carry out a conversation. The VTS assistant listening on channel 80 would not be party to this separate conversation, and having issued advice or a warning they would be

unaware of the actions agreed between the vessels concerned. A shared mental model of the developing situation and an understanding of each other's intentions is usually best achieved with a common communication circuit. There is no indication that broadcasting on VHF channel 16 was considered to ensure both vessels were aware of the situation. It is recognised there are shortcomings associated with this action, but it did offer a method of clarifying activity.

On 24 October 2023, duplex working on VHF channel 80 did not facilitate the shared understanding necessary to avoid the collision and, given the proximity of the two vessels, crucial time was lost while the VTS assistant relayed the sense of a transmission that they had received from one vessel to the OOW of the other.

The BSU recommendations made in the *Coral Ivory* and *Siderfly* investigation report further highlight the unhelpful outcome duplex VHF communications can have on operations.

2.6 THE SINKING OF *VERITY*

2.6.1 Water ingress

The bulbous bow of *Polesie* struck *Verity*'s starboard hull at a combined relative speed approaching 12kts and penetrated both the number 3 side and double bottom ballast tanks and the single cargo hold. The tanks and hold would have flooded rapidly given the size of the damaged area **(**see **Figure 13)**.

Verity was carrying a high-density cargo that occupied relatively little space so would have allowed 3,570m³ of water to flood the hold (hold volume of 5,204m³ less the volume of coils not including the coil centres of 1,631m³). The weight of water in the hold, at a relative density of 1.025, would have reached about 3,660t as the ship flooded, with the damage to the side and double bottom ballast tanks allowing an additional 268t of water to ingress. *Verity* was inundated with a catastrophic amount of water, lost buoyancy on the starboard side as the ballast tanks flooded, and the free surface effect[42] of the water in the hold would have further acted to starboard. The accounts of the surviving crew described the progressive list to capsize and the rapid sinking by the bows, which bears out this assessment. *Verity*'s damage stability criteria did not allow for irrecoverable hull flooding and as the water in the hold and ballast tanks overcame any remaining buoyancy the vessel sank.

At the time of the accident the moveable bulkheads were stowed at the aft end of the hold. It is possible that had they been used to divide the cargo hold, while not watertight, their presence would have reduced the rate at which the cargo hold flooded therefore allowing the crew more time to prepare for abandonment. Nonetheless, the damage sustained by *Verity* was not containable.

It is unknown how the probable cargo shift impacted on the speed of sinking but it is likely that, once sufficient bow down angle or starboard list was induced, the resultant shift of cargo in either direction as the lashings failed would have exacerbated the situation.

[42] Liquid that only partially fills a compartment is said to have a free surface that tends to remain horizontal (parallel to the waterline). When the ship is inclined, the liquid flows to the lower side (in the direction of inclination), increasing the inclining moment.

2.6.2 Lifesaving appliances

Verity's port liferaft deployed, presumably after activation of its hydrostatic release as the vessel sank. However, the two crew that escaped into the water were unaware of its presence. The starboard liferaft was not recovered and the salvage photographs of the bridge wing indicate it was likely destroyed in the collision.

The housing for the float-free EPIRB showed that it had been released, but as the EPIRB was found on the aft deck of the vessel when salvaged it was likely trapped upon release and later lost its buoyancy once *Verity* sank to the seabed. The EPIRB's release mechanism would seem to have operated in compliance with the IMO performance standard but its location, coupled with the dynamics of the sinking, prevented it from reaching the surface once deployed. As the location of the accident was immediately known, the failure of the EPIRB to float free from *Verity* and activate did not impede the SAR response. However, it is of concern that one liferaft and the EPIRB did not operate as designed and intended during this tragic accident.

2.7 SEARCH AND RESCUE

It was fortuitous that the Central Command for Maritime Emergencies was conducting an exercise at the time of the collision, which resulted in a rapid multi-asset response. However, it was dark, with force 6 weather conditions and rain, and due to the speed at which the vessel sank none of *Verity*'s crew had time to don lifejackets or immersion suits. Neither did they have access to other lifesaving aids, except for one survivor with a life ring. In such challenging conditions, the crew's ability to survive for more than 3 hours in the water was minimal and detecting them was challenging for the rescue assets.

The SAR response was ended at 2200 on 24 October 2023, 17 hours after the collision, by which time two survivors and one deceased crew member had been recovered. At that time four crew members remained unaccounted for, but the bodies of the C/O and an AB were found in the vessel when it was salvaged. The C/E and an AB/cook were seen to have entered the water but they remain missing.

Until the bodies of *Verity*'s missing crew are recovered it cannot be known whether they were on the surface but unfortunately missed during the SAR; however, the multi-asset search conducted was appropriate and in line with current guidance.

2.8 VOYAGE DATA RECORDERS ON SHIPS LESS THAN 3,000 GROSS TONNAGE

The scant data available from *Verity* limited the investigation. Had the vessel been fitted with a VDR then the actions of the OOW regarding their use of radar and AIS to determine risk of collision, and their subsequent use of rudder and engine movements could have been determined, allowing for a more complete investigation. There have been several serious marine casualties of less than 3,000gt internationally trading cargo vessels resulting in loss of life, notably *Swanland* and *Cemfjord*, (see section 1.19), where commercial vessels did not have VDR.

The absence of a VDR on smaller vessels can significantly hinder accident investigations, particularly in incidents involving loss of life or serious damage. VDRs capture crucial data about the ship's movements, crew decisions, and environmental conditions during an event, which are vital for understanding the causes of an

accident. Without this data, investigations can be limited where missing operational information, such as rudder movements and speed, prevents a full analysis of the events.

2.9 VESSEL TRAFFIC SERVICES AUTHORITY

The actions leading up to the collision occurred while both vessels were in an IMO authorised VTS area that spanned both German territorial and international waters. *Verity* was in international waters, so VTS navigational control was limited to the provision of advice. Although the collision occurred 0.2nm into international waters, *Polesie* was in German waters until 1 minute before the collision so VTS was authorised to give instructions to *Polesie*.

The investigation found no evidence to indicate that either the VTSO or VTS supervisor were aware of the limits of their authority, and the limit of German territorial waters was not shown on the VTS reconstruction. The instruction from VTS for *Polesie* to not alter course to port was made when the vessel was in German waters and consequently within its area of authorisation.

The nuances between navigation within a VTS controlled TSS where sections lie within and without territorial seas might not be readily apparent to seafarers. It is not known whether *Polesie*'s OOW and *Verity*'s OOW understood that VTS authority had geographical limits. However, it is important that VTS operators understand that they do not have the authority to issue SMCP Instructions to vessels outside of their nation's territorial seas.

SECTION 3 – CONCLUSIONS

3.1 CONCLUSIONS RELATING TO THE APPLICATION OF THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA, 1972, AS AMENDED

1. Analysis of the application of the IRPCS by both *Verity*'s OOW and *Polesie*'s OOW indicates significant shortcomings. Specifically, both were willing to accept inappropriately close passing distances given that their room for manoeuvre was not overly constrained by navigational hazards or limited by other traffic. While the use of VHF for collision avoidance is discouraged, an early discussion between the two OOWs to clarify intentions would have helped avoid the later ambiguity as to each vessel's actions. When actions were eventually taken to avoid a collision, they were neither positive, so as to be readily apparent to other observers, nor made in ample time. In summary, this investigation has found nothing to indicate the need to review or amend the current IRPCS. [2.4.8]

2. Rule 5 – Lookout. It cannot be known whether the absence of lookouts significantly delayed either vessel's OOW from detecting the other vessel. However, the absence of lookouts deprived both OOWs of additional resource and might have influenced their decisions to alter course using autopilot instead of tasking the lookout to take the helm and switch to manual steering. [2.4.1]

3. Rule 6 – Safe Speed. As *Verity* and *Polesie* entered the German Bight TSS, they appeared to be travelling at a safe speed for the prevailing conditions. [2.4.2]

4. Rule 7 – Risk of Collision:

   - From when *Verity* and *Polesie* entered the German Bight TSS until the collision, at no time did the CPA between the two vessels exceed 0.5nm, the minimum acceptable passing distance deemed consistent with the ordinary practice of seafarers and best practice established in court judgements. [2.4.3]

   - Due to *Verity*'s loss with the death of the OOW, and that the vessel was not required to be fitted with a VDR, it is not possible to determine when the OOW became aware of *Polesie* nor whether the CPA of the two vessels was being actively monitored. [2.4.3]

   - While *Polesie*'s OOW might have been aware of *Verity* for some time before the VTSO's first intervention, they were not using the ARPA or AIS to provide them with accurate information about *Verity*'s CPA or TCPA and so denied themselves the best information available. [2.4.3]

5. Rule 8 – Action to Avoid Collision. That all course alterations made during the interaction between *Verity* and *Polesie* were apparently completed in small increments denied the observers afloat and ashore early evidence that actions were being taken to avoid a collision; this impeded decision-making and likely distracted the OOWs conducting the turns from fully monitoring the situation. [2.4.4]

6. Rule 15 – Crossing Situation and Rule 16 – Action by Give-way Vessel:

   - While *Verity*'s OOW's motivation to pass ahead of *Polesie* cannot be known, *Verity* passing ahead of the larger, faster *Polesie* would not have resulted in a safe passing distance nor was it in line with IRPCS Rule 15. Further, the plan to pass ahead became increasingly risky as the two vessels closed on each other and it would, even if successful, have resulted in a close-quarters situation. [2.4.5]

   - By accepting a close crossing distance ahead of *Polesie* instead of taking positive action in good time to avoid a collision, *Verity*'s OOW set the conditions that triggered the VTS assistant to intervene. *Verity*'s subsequent late turn to starboard was both slow and ineffective as a collision avoidance manoeuvre and created uncertainty for both the VTS assistant and *Polesie*'s OOW. [2.4.5]

7. Rule 17 – Action by Stand-on Vessel:

   - *Polesie*'s alteration of course to port starting at 0448 did not comply with IRPCS Rule 17(a)(i), the requirement to maintain course and speed. Further, it introduced potential ambiguity as to which vessel was taking action to resolve the close-quarters situation. [2.4.6]

   - Post-accident analysis indicates that at 0452:55, when *Polesie*'s OOW started altering the vessel's heading further to port, *Polesie* could have turned inside and away from *Verity* and a collision could have been avoided. However, the turn would have been more effective and clearer to those observing had the OOW selected hand-steering and put the wheel hard over instead of altering course in increments using the autopilot. [2.4.7]

3.2 CONCLUSIONS RELATING TO THE CONDUCT OF VESSEL TRAFFIC SERVICES

1. The VTS assistant's intervention demonstrated active monitoring of traffic but it was relatively late and did not include IALA's 'Warning' message marker to stimulate action. That VTS was being conducted on a duplex VHF channel, resulting in delays in achieving common awareness and understanding while the VTS assistant relayed messages between the two vessels. [2.5.1]

2. The VTS supervisor's instruction to *Polesie*'s OOW was given when the vessels were so close that VTS intervention was counterproductive. Further, it did not allow time to resolve whether avoiding action under IRPCS Rule 17(c) or 17(b) was appropriate. However, the instruction was sufficiently forceful to cause *Polesie*'s OOW to comply. [2.5.2]

3. On 24 October 2023, duplex working on VHF channel 80 did not facilitate the shared understanding necessary to avoid the collision and, given the proximity of the vessels, crucial time was lost while the VTS assistant relayed the sense of a transmission they had received from one vessel to the OOW of the other. [2.5.3]

4. It is not known whether the OOWs on *Polesie* and *Verity* understood that VTS authority had geographical limits. However, it is important that VTS staff understand that that they do not have the authority to issue SMCP Instructions to vessels outside of their nation's territorial seas. [2.9]

3.3 OTHER SAFETY ISSUES NOT DIRECTLY CONTRIBUTING TO THE ACCIDENT

1. *Verity*'s damage stability criteria did not allow for irrecoverable hull flooding and as the water in the hold and ballast tanks overcame any remaining buoyancy the vessel sank. [2.6.1]

2. As the location of the accident was immediately known, the failure of the EPIRB to float free from *Verity* and activate did not impede the SAR response. However, it is of concern that one liferaft and the EPIRB did not operate as designed and intended during this tragic accident. [2.6.2]

3. Until the bodies of *Verity*'s missing crew are recovered it cannot be known whether they remained on the surface but not located during the SAR; however, the multi-asset search conducted was appropriate and in line with current guidance. [2.7]

4. Had *Verity* been fitted with a VDR then the actions of OOW regarding their use of radar and AIS to determine the risk of collision, and their subsequent use of rudder and engine movements, could have been determined, allowing for a more complete investigation. [2.8]

SECTION 4 – ACTION TAKEN

4.1 MAIB ACTIONS

The **MAIB** published an interim report in October 2024.

4.2 ACTIONS TAKEN BY OTHER ORGANISATIONS

Polska Żegluga Morska P.P. has issued a detailed circular to all its vessels to remind masters and crews of the importance of ensuring proper navigational watchkeeping and strict adherence to the International Regulations for Preventing Collisions at Sea, 1972, as amended, and the requirements for keeping a safe navigational watch contained in its safety management system.

The **International Organization** for **Marine Aids to Navigation**[43] has:

- Amended Guideline 1141, Operational Procedures for Delivering VTS, to specify the requirement that when duplex VHF channels are used there should be a provision for shore retransmission so that the channel behaves as if it was simplex.

- Initiated a process of amending any other documentation that refers to VHF duplex channels.

The German **Directorate General for Waterways and Shipping** has:

- Revised its simulator training scenario for complex shipping situations to reflect the condition and circumstances encountered by operators during this incident.

- Indicated that a programme of work has been started to develop a new VTS system and that the requirement for simplex VHF is included. The project timeline is from 2028 to 2034.

[43] Formerly the International Association of Marine Aids to Navigation and Lighthouse Authorities.

SECTION 5 – RECOMMENDATIONS

The **Isle of Man Ship Registry** through the UK as the member government for the **Red Ensign Group** to the **International Maritime Organization** is recommended to:

2026/115 Propose to the International Maritime Organization that SOLAS Chapter V Regulation 20 – Voyage data recorders – be amended to include ships, other than passenger ships, of 500 gross tonnage and upwards to less than 3,000 gross tonnage engaged on international voyages.

The German **Directorate General for Waterways and Shipping** is recommended to:

2026/116 Review its use of duplex very high frequency radio channels and determine how to align with the International Organization for Marine Aids guidance on the use of very high frequency radio for vessel traffic services.

2026/117 Provide guidance to staff conducting vessel traffic services interventions aimed at averting close quarters situations and collisons, including: the need for interventions to be made in good time; the appropriate use of message markers; and, when interventions should be concluded due to the proximity of the vessels to each other and likelihood that intervention will be counterproductive.

Polska Żegluga Morska P.P. is recommended to:

2026/118 Circulate this report to its fleet and ensure that its navigating officers and crew are made aware of the actions required when risk of collision exists, and of the requirement to conduct a safe navigational watch in all respects.

2026/119 Reinforce the requirement to have an additional lookout on the bridge during hours of darkness or restricted visibility.

Faversham Ships Ltd is recommended to:

2026/120 Circulate this report to its fleet and ensure that its navigating officers and crew are made aware of the actions required when risk of collision exists, and of the requirement to conduct a safe navigational watch in all respects.

2026/121 Reinforce the requirement to have an additional lookout on the bridge during hours of darkness or restricted visibility.

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

Translation of German Bight VTS report into the collision

[redacted]

20/12/2023

Ref.: [redacted]

24/10/2023 Collision MV Verity / MV Polesie

Replay Analysis:

Time	Who	Action
04:50	VTS GB	Making contact with MV Verity (CPA < 0,1 nm, TCPA 7'54"); Warning of small CPA with Polesie; intention?
	MV Verity	„keep present course and speed, change course to port, will pass on my stern if possible" (during the exchange MV Polesie slightly changes course to port, presumably waypoint)
04:51	VTS GB	Advice: „According to rules you have to act to avoid a collision. Have you talked to MV Polesie?"
04:51:14	MV Verity	„Ok, I will change course to starboard and pass on your aft"(CPA < 0,1 nm; TCPA 5'41'')
	VTS GB	„Ok, I will inform MV Polesie that you pass astern of MV Polesie"
04:51:48	VTS GB	Making contact with MV Polesie: „There is a small CPA with the MV Verity on your portside. The MV Verity pass behind you, he told me he come to starboard and pass behind you. Please be aware of the situation."
04:52:10	MV Polesie	„Yes, (I will) be looking and be a little bit to starboard." (<0,2 nm; CPA 04'45'')
04:53:14		Verity starts slight turn to starboard (CPA 0,1 nm; TCPA 3'2'')
04:53:40		CPA <0,1 nm; TCPA 2'25''; MV Verity turns to starboard, slight turning tendency to port by MV Polesie
04:53:47	VTS GB	Calls MV Polesie: „Do not come to portside, come to starboard side."
	MV Polesie	„Yes"
04:54:40	VTS GB	Making contact with MV IONA; Warning, keeping well clear, dangerous situation

Watchkeeping / Roster

- VTS Centre was understaffed (one NA missing)

Traffic control systems

- The AIS and radar data could be recorded as traffic data
- Radio traffic on channel 80 (recorded), channel 79 (not recorded) .
- At the time of the collision there were no technical faults in the traffic services and office technology (PC, telephone).

Traffic volume/weather/wind :

- The traffic volume was normal (high tide Helgoland was at 7:36 a.m.).
- anchorage occupancy normal
- Wind: East around 6, swell 2.5 m
- Collision in darkness at 4.55 a.m.

Evaluation:

- Traffic situation developed over a longer period of time; from MV Verity's point of view, it was a challenging but not exceptional traffic situation (MV Iona followed MV Polesie on roughly the same course and at the same speed but slightly further south); experience shows that smaller vessels such as MV Verity often give way to stand-on vessels relatively late because they only need a small manoeuvring space and want to deviate from their actual course as little as possible
- Repeated reports of ships entering the area and position reports on channel 80 (channel 79 was not recorded, radio traffic was certainly also taking place there), which simultaneously required the attention of the staff (radio traffic and data input; correlation).
- Contact made by VTS GB with MV Verity at approx. 7.5/8 minutes until collision (TCPA), distance between the vessels approx. 1.3/1.4 nautical miles; TCPA reduced due to a port course alteration by MV Polesie, presumably when reaching a planned waypoint
- Contact was made by VTS with warning advice to the ship's commands, see VV-WSV 2408
- At this point (distance between the vessels a good nautical mile), MV Verity should have responded vigorously. At this distance between the vessels, it was not possible to wait any longer and there was practically no second chance for the VTS to act before the vessels came into close quarters.
- According to the radio statement, the officer on watch on MV Verity had not considered evading at all (keep course), but then made a clear statement (course alteration to starboard, passing at the stern).
- VTS informed MV Polesie about the planned manoeuvre of the Verity; officer on watch on MV Polesie confirmed that he had the situation in view and was still coming a little to starboard.
- VTS had initiated a clear and timely warning as well as a clear agreement (problem solution) and action by the ship's commands
- After the starboard manoeuvre was announced, it took MV Verity about one minute to initiate a recognisable turning manoeuvre, which did not appear to be sufficiently forceful after evaluating the replay
- Immediately before the collision, a course alteration of the stand-on vessel MV Polesie to port can be seen after replay. Last second manoeuvres must be executed by the stand-on vessel to starboard, away from the other vessel involved in the collision; MV Polesie could have prevented the collision with a last second manoeuvre.
- VTS attempted to make MV Polesie comply with traffic law and prevent her from turning to port (reaction to non-compliance with Rule 17 c. COLREGs). At this point, the vessels were already in an absolute close-quarters situation; any further intervention by means of an instruction other than to admonish the vessel to comply with the applicable traffic law is prohibited in a close-quarters situation, see § 24 VV WSV 2408. In a close-quarters situation, the reaction time for vessel commands to respond to individual instructions issued by the VTS is too short and the success of manoeuvres by vessels cannot be guaranteed. Manoeuvres of ships can no longer be analysed with regard to the desired success. In the close-quarters situation, it is only necessary to prevent a direct collision in accordance with Rule 17c COLREGs, which is known to all traffic participants.
- MV Verity could have prevented the collision by an early evasion to starboard as well as by a decisive manoeuvre to starboard, as announced by her.
- The MV Verity would also have had the option of avoiding the collision by altering course to port (hard to port; full circle).
- MV Polesie was stand-on vessel, but could have avoided the collision with a las second manoeuvre to starboard.

Conclusion:

The VTS reacted and took appropriate action to clarify the traffic situation. The watchkeeping officer on board MV Verity made a discretionary decision as to how to resolve the acute problem. The attention of the officer on watch on board MV Verity was drawn to the dangerous traffic situation with MV Polesie by the advice and warning given in the course of the traffic assistance (see below, extract from §23 VV-WSV 2408).

The officer on watch on board MV Verity made the decision to keep to starboard. The VTS drew the attention of the officer on watch on MV Polesie to the manoeuvre of the Verity and generally warned him of the risk of collision. Both vessels confirmed the intended solution to the situation, but ultimately did not react in accordance with the agreed solution. MV Verity did not carry out manoeuvres (starboard course alteration) decisively. In the resulting close quarters situation, the VTS could no longer take any measures ("In areas in which manoeuvres of vessels can no longer be analysed with regard to the intended success, the VTS may not intervene in the behaviour of the vessels.", VV-WSV 2408, §24).

Last second manoeuvres of the stand-on vessel, in this case MV Polesie, must not be made to port (Rule 17c. COLREGs). The last contact between the VTS and MV Polesie ("Do not come to portside, come to starboard side.") is to be interpreted as a reaction to the non-compliant manoeuvring of MV Polesie.

There is no evidence of any misconduct on the part of the staff at the VTS Centre.

[redacted]

[redacted]

Extract from VV-WSV-2408:

§ 23 Traffic assistance

[...] Traffic assistance includes:

Advice and warnings

Advice and warnings by the NvD are intended to draw the attention of traffic participants to dangerous situations. [...]

§ 24 Traffic regulations

[...] The manner in which the instructions are most appropriately complied with shall in principle be decided by the ship's command. In areas where manoeuvres of vessels can no longer be analysed with regard to the desired success, the VTS may not intervene in the behaviour of the vessels. A warning to the ship's command concerned remains unaffected by this. [...]

COLREGS

Rule 17

[…]

Annex B

Extract of relevant rules from the International Regulations for Preventing Collisions at Sea, 1972, as amended

Rule 2

Responsibility

(a) Nothing in these Rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to comply with these Rules or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

(b) In construing and complying with these Rules due regard shall be had to all dangers of navigation and collision and to any special circumstances, including the limitations of the vessels involved, which may make a departure from these Rules necessary to avoid immediate danger.

Rule 5

Look-out

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

Rule 7

Risk of Collision

(a) Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.

(b) Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.

(c) Assumptions shall not be made on the basis of scanty information, especially scanty radar information.

(d) In determining if risk of collision exists the following considerations shall be among those taken into account:

(i) Such risk shall be deemed to exist if the compass bearing of an approaching vessel does not appreciably change;

(ii) such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large vessel or a tow or when approaching a vessel at close range.

Rule 8

Action to avoid Collision

(a) Any action to avoid collision shall be taken in accordance with the Rules of this Part and shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship.

(b) Any alteration of course and/or speed to avoid collision, shall, if the circumstances of the case admit, be large enough to be readily apparent to another vessel observing visually or by radar; a succession of small alterations of course and/or speed should be avoided.

(c) If there is sufficient sea room, alteration of course alone may be the most effective action to avoid a close-quarters situation provided that it is made in good time, is substantial and does not result in another close-quarters situation.

(d) Action taken to avoid collision with another vessel shall be such as to result in passing at a safe distance. The effectiveness of the action shall be carefully checked until the other vessel is finally past and clear.

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

(f) (i) A vessel which, by any of these Rules, is required not to impede the passage or safe passage of another vessel shall, when required by the circumstances of the case, take early action to allow sufficient sea room for the safe passage of the other vessel.

(ii) A vessel required not to impede the passage or safe passage of another vessel is not relieved of this obligation if approaching the other vessel so as to involve risk of collision and shall, when taking action, have full regard to the action which may be required by the Rules of this part.

(iii) A vessel the passage of which is not to be impeded remains fully obliged to comply with the rules of this part when the two vessels are approaching one another so as to involve risk of collision.

Rule 10

Traffic Separation Schemes

(a) This Rule Applies to traffic separation schemes adopted by the Organization and does not relieve any vessel of her obligation under any other rule.

(b) A vessel using a traffic separation scheme shall:

(i) proceed in the appropriate traffic lane in the general direction of traffic flow for that lane;

(ii) so far as practicable keep clear of a traffic separation line or separation zone;

(iii) normally join or leave a traffic lane at the termination of the lane, but when joining or leaving from either side shall do so at as small an angle to the general direction of traffic flow as practicable.

(c) A vessel shall so far as practicable avoid crossing traffic lanes, but if obliged to do so shall cross on a heading as nearly as practicable at right angles to the general direction of traffic flow.

(d) (i) A vessel shall not use an inshore traffic zone when she can safely use the appropriate traffic lane within the adjacent traffic separation scheme. However, vessels of less than 20 meters in length, sailing vessels and vessels engaged in fishing may use the inshore traffic zone.

(ii) Notwithstanding subparagraph (d) (i), a vessel may use an inshore traffic zone when en route to or from a port, offshore installation or structure, pilot station or any other place situated within the inshore traffic zone, or to avoid immediate danger.

(e) A vessel, other than a crossing vessel, or a vessel joining or leaving a lane shall not normally enter a separation zone or cross a separation line except:

(i) in cases of emergency to avoid immediate danger;

(ii) to engage in fishing within a separation zone.

(f) A vessel navigating in areas near the terminations of traffic separation schemes shall do so with particular caution.
(g) A vessel shall so far as practicable avoid anchoring in a traffic separation scheme or in areas near its terminations.
(h) A vessel not using a traffic separation scheme shall avoid it by as wide a margin as is practicable.
(i) A vessel engaged in fishing shall not impede the passage of any vessel following a traffic lane.
(j) A vessel of less than 20 meters in length or a sailing vessel shall not impede the safe passage of a power-driven vessel following a traffic lane.
(k) A vessel restricted in her ability to manoeuvre when engaged in an operation for the maintenance of safety of navigation in a traffic separation scheme is exempted from complying with this Rule to the extent necessary to carry out the operation.
(l) A vessel restricted in her ability to manoeuvre when engaged in an operation for the laying, servicing or picking up of a submarine cable, within a traffic separation scheme, is exempted from complying with this Rule to the extent necessary to carry out the operation.

Rule 15

Crossing Situation

When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel.

Rule 16

Action by Give-way Vessel

Every vessel which is directed to keep out of the way of another vessel shall, so far as possible, take early and substantial action to keep well clear.

Rule 17

Action by Stand-on Vessel

(a) (i) Where one of two vessels is to keep out of the way the other shall keep her course and speed.

(ii) The latter vessel may however take action to avoid collision by her manoeuvre alone, as soon as it becomes apparent to her that the vessel required to keep out of the way is not taking appropriate action in compliance with these Rules.

(b) When, from any cause, the vessel required to keep her course and speed finds herself so close that collision cannot be avoided by the action of the give-way vessel alone, she shall take such action as will best aid to avoid collision.

(c) A power-driven vessel which takes action in a crossing situation in accordance with sub-paragraph (a)(ii) of this Rule to avoid collision with another power-driven vessel shall, if the circumstances of the case admit, not alter course to port for a vessel on her own port side. (d) This Rule does not relieve the give-way vessel of her obligation to keep out of the way

Rule 34

Manoeuvring and Warning Signals

(a) When vessels are in sight of one another, a power-driven vessel underway, when manoeuvring as authorized or required by these Rules, shall indicate that manoeuvre by the following signals on her whistle:

- one short blast to mean 'I am altering my course to starboard ';
- two short blasts to mean 'I am altering my course to port ';
- three short blasts to mean 'I am operating astern propulsion'.

(b) Any vessel may supplement the whistle signals prescribed in paragraph (a) of this Rule by light signals, repeated as appropriate, whilst the manoeuvre is being carried out:

(i) these light signals shall have the following significance: - one flash to mean 'I am altering my course to starboard '; - two flashes to mean 'I am altering my course to port '; - three flashes to mean 'I am operating astern propulsion';

(ii) the duration of each flash shall be about one second, the interval between flashes shall be about one second, and the interval between successive signals shall be not less than ten seconds;

(iii) the light used for this signals shall, if fitted, be an all-round white light, visible at a minimum range of 5 miles and shall comply with the provisions of Annex I to these Regulations.

(c) When in sight of one another in a narrow channel or fairway:

(i) a vessel intending to overtake another shall in compliance with Rule 9(e) (i) indicate her intention by the following signals on her whistle :

- two prolonged blasts followed by one short blast to mean 'I intend to overtake you on your starboard side';
- two prolonged blasts followed by two short blasts to mean 'I intend to overtake you on your port side';

(ii) the vessel about to be overtaken when acting in accordance with Rule 9(e)(i) shall indicate her agreement by the following signal on her whistle:

- one prolonged, one short, one prolonged and one short blast, in that order.

(d) When vessels in sight of one another are approaching each other and from any cause either vessel fails to understand the intentions or actions of the other, or is in doubt whether sufficient

action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short and rapid blasts on the whistle.
Such signal may be supplemented by a light signal of at least five short and rapid flashes.
(e) A vessel nearing a bend or an area of a channel or fairway where other vessels may be obscured by an intervening obstruction shall sound one prolonged blast. Such signal shall be answered with a prolonged blast by any approaching vessel that may be within hearing around the bend or behind the intervening obstruction.
(f) If whistles are fitted on a vessel at a distance apart of more than 100 metres, one whistle only shall be used for giving manoeuvring and warning signals.

4 Manoeuvring and Warning Signals
(a) When vessels are in sight of one another, a power-driven vessel underway, when manoeuvring as authorized or required by these Rules, shall indicate that manoeuvre by the following signals on her whistle:
- one short blast to mean 'I am altering my course to starboard ';
- two short blasts to mean 'I am altering my course to port ';
- three short blasts to mean 'I am operating astern propulsion'.
(b) Any vessel may supplement the whistle signals prescribed in paragraph (a) of this Rule by light signals, repeated as appropriate, whilst the manoeuvre is being carried out:
(i) these light signals shall have the following significance:
- one flash to mean 'I am altering my course to starboard '; -
two flashes to mean 'I am altering my course to port ';
- three flashes to mean 'I am operating astern propulsion';
(ii) the duration of each flash shall be about one second, the interval between flashes shall be about one second, and the interval between successive signals shall be not less than ten seconds;
(iii) the light used for this signals shall, if fitted, be an all-round white light, visible at a minimum range of 5 miles and shall comply with the provisions of Annex I to these Regulations.
(c) When in sight of one another in a narrow channel or fairway:
(i) a vessel intending to overtake another shall in compliance with Rule 9(e) (i) indicate her intention by the following signals on her whistle :
- two prolonged blasts followed by one short blast to mean 'I intend to overtake you on your starboard side';
- two prolonged blasts followed by two short blasts to mean 'I intend to overtake you on your port side';
(ii) the vessel about to be overtaken when acting in accordance with Rule 9(e)(i) shall indicate her agreement by the following signal on her whistle:
- one prolonged, one short, one prolonged and one short blast, in that order.
(d) When vessels in sight of one another are approaching each other and from any cause either vessel fails to understand the intentions or actions of the other, or is in doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short and rapid blasts on the whistle. Such signal may be supplemented by a light signal of at least five short and rapid flashes.
(e) A vessel nearing a bend or an area of a channel or fairway where other vessels may be obscured by an intervening obstruction shall sound one prolonged blast. Such signal shall be answered with a prolonged blast by any approaching vessel that may be within hearing around the bend or behind the intervening obstruction.

(f) If whistles are fitted on a vessel at a distance apart of more than 100 metres, one whistle only shall be used for giving manoeuvring and warning signals.

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