Report on the investigation of

the collision between

# European Tideway and Vrouw Grietje

in the North Sea

16 October 2000

Marine Accident Investigation Branch First Floor Carlton House Carlton Place Southampton United Kingdom SO15 2DZ

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## Extract from

# The Merchant Shipping (Accident Reporting and Investigation)

#### **Regulations 1999**

The fundamental purpose of investigating an accident under these Regulations is to determine its circumstances and the cause 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.

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# **GLOSSARY OF ABBREVIATIONS AND ACRONYMS**

ARPA	Automatic Radar Plotting Aid
BST	British Summer Time
CPA	Closest Point of Approach
DGPS	Differential Global Positioning System
ECDIS	Electronic Chart Display and Information System
GMDSS	Global Maritime Distress and Safety System
IBS	Integrated Bridge System
IMO	International Maritime Organization
ISM	International Safety Management
kW	Kilowatt
OOW	Officer of the Watch
ro-ro	Roll on-Roll off
VDR	Voyage Data Recorder
VER	Voyage Event Recorder
VHF	Very High Frequency
VMS	Voyage Management System

#### SYNOPSIS



At about 1600 BST on 16 October 2000, the MAIB was informed of a collision involving the United Kingdom ro-ro passenger ferry *European Tideway*, and the Netherlands fishing vessel *Vrouw Grietje*. Damage was said to have been sustained by the ferry which was heading towards Felixstowe at slow speed. The ferry reported no injuries. It was unknown at that time if the fishing vessel had suffered any damage or injuries. MAIB inspector Andrew Clifton carried out the investigation.

European Tideway was on passage from Europoort to Felixstowe, making good between 15.5 and 16 knots on a westerly course. She had 32 crew and 15 passengers on board and was part-loaded with freight.

Vrouw Grietje had left the port of Stellendam that morning and had started fishing in a north-westerly direction. She had seven crew on board. The skipper had left the wheelhouse at 1430 informing the deckhand on watch, his 19-year-old son, to turn around at a pre-determined position and to continue fishing to the south-east.

Vrouw Grietje crossed European Tideway's bow from port to starboard at a distance of about 2 miles, and then reached the pre-determined position. The deckhand then altered course to starboard through about 180° without first checking visually, or by radar, for other vessels.

European Tideway's OOW then interpreted that a risk of collision existed and after briefly assessing the situation, altered course to starboard. Shortly after the ferry's alteration, Vrouw Grietje's watchkeeper altered course to port. The fishing vessel was swinging to port quicker than the ferry was swinging to starboard, and the two vessels collided. The fishing vessel impacted bow-on to the ferry's port bow.

Vrouw Grietje suffered slight damage to her bow and forward handrails. European Tideway sustained a 6-metre long gash in her port bow above the waterline. There were no injuries and no pollution.

The collision was witnessed by a nearby vessel fitted with a voyage management system which recorded the course, speed and actions of both vessels up to the time of the collision. This information was of great assistance to the investigation.

The initiating cause of the collision was Vrouw Grietje's watchkeeper altering course, resulting in an interpreted risk of collision with European Tideway.

Recommendations are addressed to *European Tideway*'s owner regarding voyage data recorders, the use of water-based information for collision avoidance, visual bearings and post-collision action. Recommendations are also addressed to *Vrouw Grietje*'s owner regarding the need for a proper lookout, competent watchkeepers and skipper's instructions.

# PARTICULARS OF VESSELS AND ACCIDENT

#### Vessel details

Name of vessel		<u>European Tìdeway</u> (Figure 1)	Vrouw Grietje
Registered owner		P&O North Sea Ferries	J Van Dam & Zonen
Port of registry	:	London	Goedereede
Flag	:	United Kingdom	Netherlands
Туре	:	Passenger ro-ro	Beam trawler
Built	:	1977 in South Korea	1991 in Netherlands
Classification society		Lloyd's Register of Shipping	None
Construction	:	Steel	Steel
Length overall	:	184.9m	40.11m
Gross tonnage	:	21,162	419
Engine power	:	11474kW	1471kW
Service speed		16.5 knots	About 10 knots
Accident details			
Time and date :		1458 BST 16 October 2000	
Location of incident :		52°03.36'N 02°30.73'E	
Persons on board		32 crew + 15 passengers	7 crew
Injuries/fatalities	:	None	None
Damage		6 x 1.5m gash in bow	Slight bow damage



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European Tideway

Figure 1





Figure 2

# **SECTION 1 - FACTUAL INFORMATION**

#### 1.1 BACKGROUND

#### European Tideway

*European Tideway* was a ro-ro passenger ferry owned and managed by P&O North Sea Ferries. She was built in 1977 as *Stena Runner* and had three other names before becoming *European Tideway* in 1992. The vessel was owned by Townsend Thoresen until 1987, when P&O European Ferries became her owner. In 1997 the ownership was changed to P&O North Sea Ferries.

She was 184.9m in length and could carry up to 166 passengers. These passengers would, under normal circumstances, be mainly drivers of freight vehicles. She had a capacity of around 200 lorries or 280 cars on her internal ro-ro decks which ran virtually the length of the vessel. She normally carried a mixture of accompanied and unaccompanied freight and containers.

She had twin-screw controllable pitch propellers, twin rudders and twin bow thrusters. Her service speed was 16.5 knots.

*European Tideway* was employed by P&O North Sea Ferries on the Europoort to Felixstowe run, making two sailings a day. She spent about 4½ hours alongside and about seven hours on passage, sailing at 1130 and 2230 each day. There was also an occasional routine "layover" period which alternated the sailing times.

The course from Europoort to Felixstowe was virtually due west the entire passage, a distance of around 100 miles. The passage crosses one of the busiest shipping channels in the world, consisting of vessels bound to and from the North Sea and the Dover Strait. Many fishing and recreation craft, of various sizes, in addition to coastal traffic, also use these waters. In this area visibility is often moderate to poor, with fairly frequent fog and rain showers.

The certification issued in respect of *European Tideway* was valid at the time she departed Europoort, and she was manned in accordance with her safe manning certificate. The vessel had full international safety management (ISM) certification, with a safety management system in place.

#### Vrouw Grietje

*Vrouw Grietje* was a 40.11m beam trawler of steel construction. She was owned and managed by J Van Dam & Zonen, who owned one other fishing vessel. She was built in 1991 and regularly fished in the North Sea. The skipper was a joint owner of the vessel.

The Netherlands Shipping Inspectorate provided the MAIB with statements and other information in respect of *Vrouw Grietje*. However, the MAIB received no response from *Vrouw Grietje*'s owner to requests for information during the course of this investigation, and therefore, was unable to establish some further details.

#### 1.2 THE CREW

#### European Tideway

*European Tideway* had a crew of 32. All were British nationals. There were four deck officers including the master. The chief officer did not keep a bridge watch; this was carried out by the two second officers who worked a 6 hours on 6 hours off watch rotation. Their watches were from 9 to 3 and 3 to 9 morning and evening. This ensured an overlap between cargo work and bridge watchkeeping so that all 6 hours were not spent on the bridge.

The 53 year old master had been at sea for 36 years, and had attained his master's certificate of competency in 1976. He had been with the company for 26 years and on *European Tideway* for 15 years. He had pilot exemption certificates for both Europoort and Felixstowe, negating the requirement to take a pilot at these ports.

The second officer on watch at the time of the collision was 35 years old and had been at sea for 17 years. He had worked for the company for 6 years, serving almost exclusively on *European Tideway* during this period.

The second officer who was on the bridge ready to take over the watch at the time of the collision, was 38 years of age and had been at sea for 18 years. He had been with the company for 5 years and had spent 2 years on *European Tideway*.

Both second officers had attended a bridge resource management course within the previous 3 years.

#### Vrouw Grietje

Vrouw Grietje had a crew of seven, all resident in the Netherlands.

The 50 year old skipper had been fishing for 36 years, the last 25 as skipper. He was qualified to be a skipper in these waters. He was a joint owner of *Vrouw Grietje.* 

The deckhand who was on watch was 19 years of age, and was the skipper's son. He had served one year's apprenticeship on *Vrouw Grietje* and was qualified to be a watchkeeper. He had been a sole watchkeeper since August 2000.

#### 1.3 BRIDGE EQUIPMENT

#### 1.3.1 European Tideway

#### <u>Radars</u>

European Tideway had the following three radars:

- Racal Decca Bridgemaster Type 65620
- Racal Decca Bridgemaster ARPA Type 65626/CAK/A (See Figure 3)
- Racal Decca Bridgemaster Type 65620/CAA. (Stern radar)

It was normal practice to use the radars on true motion, fixed origin with one radar using water speed, fed from the electro-magnetic log, and the other using ground speed. Both second officers preferred to have the radars set up the same way; the automatic radar plotting aid (ARPA) on ground-based information and 12-mile range, and the smaller radar on water-based information and 6-mile range. The ARPA was used as their primary means for collision avoidance. There were no radar blind or shadow sectors forward of the beam.

#### Azimuth mirrors

There were two azimuth mirrors on the bridge. However, neither second officer used them for taking visual bearings to determine if a risk of collision existed in a crossing situation. The master expected his officers to take visual bearings where necessary. However, the close proximity of the compass repeaters to the bridge window frames resulted in certain arcs of the horizon being obscured.

#### Communication equipment

There were three VHF radio sets and a full GMDSS station for sea area A2 on the bridge.

#### Other Equipment

The following additional navigational equipment was carried on the bridge:

- Leica MX 400 Differential Global Positioning System (DGPS) navigator
- Sperry MK37 gyrocompass
- Sperry Gyropilot
- Furuno echo sounder F850-K
- Tyfon whistle unit TI-40

# Figure 3



ARPA on European Tideway

# 1.3.2 Vrouw Grietje

- Echo Sounding Device
- Gyro-compass
- ARPA Radar
- Radar
- VHF Radio-Telephone
- DGPS

#### 1.4 ENVIRONMENTAL CONDITIONS

The visibility at the time of the collision was 3 to 4 miles, with intermittent light to moderate rain and overcast skies. The wind was south-westerly force 4 to 5, and the sea state was slight to moderate. The barometric pressure was 1002 millibars and the tide was setting 025° at about 1.5 knots.

#### 1.5 NARRATIVE (ALL TIMES BST, ALL COURSES ARE TRUE) (Figure 2)

1.5.1 *European Tideway* had a routine night "layover" period on the evening of 15 October 2000 alongside in Beneluxhaven, Europoort.

The vessel shifted berth between 0736 and 0752 the next day. The 3 to 9 watch second officer assisted with the shifting of the vessel and then went ashore for an hour in the morning. He had a brief rest after lunch before proceeding to the bridge for his watch at 1500. The other second officer had been ashore for about 3 hours the previous evening and had gone to bed at 2300. He awoke at 0800 and started duty at 0900 on the car deck. It had not been necessary to keep watches overnight since the vessel was alongside and not working cargo.

She completed loading at 1040. There was a part-cargo on board, quite normal for a Monday morning, along with 32 crew and 15 passengers. The departure draughts were 5.24m forward, and 6.18m aft. The stern door was secured at 1057 and the vessel was clear of the berth at 1102. *European Tideway* passed through the breakwaters at 1127 and the sea passage commenced at 1133.

The master handed over conduct of the navigation to the second officer as the vessel was approaching MW 6 buoy at 1210, and left instructions regarding being called for arrival. When the master left the bridge, the second officer and two seamen remained as the bridge team.

1.5.2 *Vrouw Grietje* left the port of Stellendam in the Netherlands at 0200 on the same day. At 0700 she was in position 51°53'N 002°53'E and began fishing in a north-westerly direction between the English and Netherlands shelf with her fishing day signal displayed. She had her ARPA radar set on 12-mile range and the other radar on 6-mile range. She was navigating using her DGPS. At 1400 the gear was shot again, and at 1430 the skipper left the wheelhouse having been relieved by his son. Before leaving, the skipper instructed him to fish in a northwesterly direction to 52°05.5'N 002°30'E and then turn to starboard on to a south-easterly course before hauling again at about 1540. The radar echoes of other vessels on the radar were discussed and none posed any immediate problem. The deckhand was told to call the skipper if he had any problems, or was in any doubt.

The beginning of *European Tideway*'s passage was uneventful; the second officer had the vessel in automatic pilot, steering 270°. She was making good between 15.5 and 16 knots. As usual, the ARPA radar was set to the 12-mile

range using ground-based information. The smaller radar was set to the 6-mile range and was using water-based information. One of the seamen left the bridge at 1430 to call the next watch.

At about 1435, the second officer observed the radar echo of another vessel at about 4 points on the port bow at a range of around 6 miles. *European Tideway* was steering 273° at this time, as she was slightly south of the planned track. The echo was plotted on the ARPA and was found to be heading in a north-westerly direction at about 8 knots. It had a crossing range of 1.5 miles ahead and a closest point of approach (CPA) of 0.7 mile. It was a routine crossing situation which posed no risk of collision and did not unduly concern the second officer. At about 3.5 miles range he plotted the echo on the smaller radar, and the information obtained was similar to that of the ARPA. At around 3 miles range the second officer observed the vessel (*Vrouw Grietje*) visually through binoculars, and identified her as a beam trawler with gear hanging from her extended beams. He did not notice a fishing day signal being displayed.

1.5.3 *Vrouw Grietje* crossed *European Tideway*'s bow at about 2 miles range at 1451 and continued her north-westerly course, but at a slower speed of around 5 knots. Just after this, the relieving second officer and seaman entered the bridge. The second officer on watch began handing over to his relief, while standing in the centre of the bridge. The two seamen were standing to port of the centre of the bridge, talking.

At 1454 *Vrouw Grietje* had reached the position at which the skipper had told his son to turn around, and the latter duly altered his course to starboard. He did not check the radar, or make a visual check of the proximity of other vessels before doing so. The skipper, who was lying awake on his bunk and had felt the engine power decreasing, assumed, correctly, that his vessel was turning.

One of the seamen on *European Tideway* noticed that *Vrouw Grietje*, now on the starboard bow and at a range of just over 1 mile, had altered course to starboard. He reported this immediately to the second officer, who discontinued handing over and retained conduct of the navigation. He looked through the binoculars at the fishing vessel and confirmed that she had, indeed, altered course to starboard and was now on a south- easterly heading and crossing. Her port side and bow wave were clearly visible to those on the bridge. The seaman who had recently arrived on the bridge was put on the wheel and told to steer 270°. The ARPA vector had not yet caught up with the change in course, as the data was still being processed by the ARPA's computer.

The deckhand on watch on the fishing vessel had observed the ferry by radar during the turn. He did not plot the ferry's echo on the ARPA.

For about 20 to 30 seconds the ferry's bridge team took no action. During this time *Vrouw Grietje*'s relative bearing was observed to see if it changed, using a

bridge window frame as reference. The bearing appeared to be constant at a range of just under a mile. At around 0.5 mile range the ARPA was showing a CPA of zero. Interpreting that the fishing vessel was on a collision course, the second officer ordered "starboard 15" followed a few seconds later by "starboard 20". The relieving second officer suggested one short blast, and this was sounded.

1.5.4 *European Tideway* started to swing to starboard and, with *Vrouw Grietje* about one point on the starboard bow, the fishing vessel was seen to be altering course to port. When the fishing vessel was right ahead the range was down to 2 cables. The fishing vessel's deckhand put the engines to idle and called his skipper, who immediately entered the wheelhouse, saw the ferry and put his engines astern. *European Tideway* continued to alter to starboard and the fishing vessel continued to alter course to port. A succession of short and rapid blasts on the whistle was sounded by the ferry, her starboard engine was put astern and her port engine's ahead movement was reduced.

A few seconds before impact, the relieving second officer called the master and informed him a collision with a fishing vessel was imminent. *Vrouw Grietje* came on to the ferry's port bow but was still swinging quickly to port and, despite the ferry's swing to starboard, collided stem on to *European Tideway*'s port bow. Both engines on the ferry were stopped. The fishing vessel impacted just the once and, rolling heavily, moved down the port side of the ferry. The collision occurred at 1458 in position 52°03.36'N 02°30.73'E. At the time of the collision *European Tideway* was heading 355° at about 12 knots, and *Vrouw Grietje* was heading easterly at around 4 knots.

1.5.5 The master reached the ferry's bridge shortly after the collision, and attempts were made to contact the fishing vessel using VHF radio. Contact was made, and the names of the vessels and their owners were exchanged. The fishing vessel identified herself as *Vrouw Grietje*, a beam trawler registered in the Netherlands, and reported little damage and no injuries.

*European Tideway* had stopped her swing to starboard on a northerly heading and then altered course to port on to a north-north-westerly heading. Personnel were sent forward to check for damage. There was some confusion regarding closure of the watertight doors, some of which were open and some shut at the time of the collision. The master did not order the doors to be closed as he was under the impression that they were already closed when he arrived on the bridge, but he was not entirely sure. Neither of the second officers attempted to close them, but all watertight doors were finally closed from the engine room about 5 minutes after the impact. No announcement was made to the passengers, nor was the general emergency alarm sounded.

Thames Coastguard and P&O North Sea Ferries' office in Hull were contacted and informed of the collision. The vessel then continued to Felixstowe at slow speed. A 6 x 1.5m gash was found in the port bow of the ferry about 4m above the waterline. This was in way of the main car deck, (see Figure 4). *Vrouw Grietje* sustained only light damage to her bow and forward handrails (see! Figure 5). She continued fishing for the rest of the week before returning to port.

There were no injuries and no pollution as a result of the collision.

*European Tideway* discharged her cargo and then proceeded to Rotterdam for repairs, which were completed on 23 October when she resumed service.

Two other vessels were in close proximity at the time of the collision.

**Stena Seatrader,** a ro-ro passenger ferry, was also bound for Felixstowe from Rotterdam. She was about two miles south of both vessels, on the ferry's port quarter, and saw them collide. The officer on watch noted Vrouw *Grietje* was rolling heavily and appeared to haul in her nets immediately after the collision.

Autoprogress, a feeder car carrier, was about 1 mile on the starboard quarter of European Tideway at the time of the collision. She was steering a northwesterly course bound from Flushing for Hartlepool. She had just passed around the ferry's stern, and although she did not witness the impact visually, as Vrouw Grietje was hidden from view behind European Tideway's bow, she saw the movements of both vessels in the minutes leading up to the collision. She had a voyage management system (VMS) supplied by Litton Marine, which recorded the radar echoes, true vectors and target trails of both vessels during the period leading up to the collision.

Damage to European Tideway (viewed from car deck)



Damage to bow of Vrouw Grietje

#### 1.6 VOYAGE DATA RECORDER

Vessels operated by P&O North Sea Ferries have been fitted, at some expense, with voyage data recorders (VDR). They have been provided for a variety of purposes, including the provision of accurate data in the event of an accident. Such information is extremely useful for the reconstruction of the circumstances surrounding an accident and, more importantly, to understand why things happened.

*European Tideway* was equipped with a Broadgate VER 2000 voyage data recorder.

Voyage event recorder (VER) is the manufacturer's name for the VDR. This is the second generation of Broadgate VERs. The third generation, the VER 3000, is one of the first VDRs to be type-approved and complies fully with IMO Performance Standard A.861(20).

The VER 2000, as fitted on *European Tideway*, records the voice and ambient sounds made on the bridge, the raw radar picture and the vessel's position, course and speed as fed from the vessel's GPS satellite receiver. The data is recorded over a 24-hour period on a 5.25-inch (133mm) magneto-optical disc.

The disc was removed 10 minutes after the collision. When played back at Broadgate's headquarters it was found to have functioned correctly. The radar data was clear, and provided information which was of great assistance to this investigation.

The bridge sound recordings were less clear. A radio news programme being broadcast on the bridge obscured the majority of voice and other sounds made on the bridge during a period prior to the collision. The audio quality might also have been affected by the location of the bridge microphones.

#### 1.7 LITTON MARINE VOYAGE MANAGEMENT SYSTEM

Autoprogress was fitted with a Litton Marine Vision 2100 voyage management system (VMS). This is an integrated bridge system (IBS) in which the navigational and machinery controls are combined into one bridge console. This gives layout, ergonomic, monitoring and efficiency advantages.

The Vision 2100 includes two ARPA radars and an ECDIS with the radar targets overlayed on the electronic chart. The VMS has a built-in recording facility whereby the data displayed is saved in the system and can be replayed up to 30 days after the recording is made. After this time it is erased from the system and can no longer be viewed.

The echo information is fed from whichever radar acquires the echo first. In this instance, the starboard radar on *Autoprogress* was used to track both *European Tideway* and *Vrouw Grietje* using ground-based information. The vessel was visited in Hartlepool on 23 October 2000 by an MAIB inspector and a technician from Litton Marine. The owner, master, and crew were very co-operative and the recording was viewed and copied.

More and more vessels are being fitted with IBS similar to the Litton Marine VMS, and it is therefore quite likely that more "third party" vessels will witness collisions and record the data on their equipment. This data is extremely useful to the accident investigator.

#### 1.8 THE COLLISION REGULATIONS

Extracts from the International Regulations for Preventing Collisions At Sea 1972 can be seen in **Annex A**.

#### **1.9 BRIDGE PROCEDURES GUIDE**

The *Bridge Procedures Guide* is written guidance issued by the International Chamber of Shipping to encourage good bridge watchkeeping practices, and is intended to reflect the best navigational practices for today's bridge watchkeeper.

It was carried on the bridge of *European Tideway* and is aimed at merchant vessels. A copy was not carried on board *Vrouw Grietje*.

Part C of the *Bridge Procedures Guide* (Edition 3 1998) contains emergency checklists. Checklist C2 refers to collisions. It is reproduced in **Annex B**.

#### 1.10 P&O NORTH SEA FERRIES' SHIP CASUALTY PROCEDURES

The following is an extract from P&O North Sea Ferries' ship casualty procedures checklist number 3(a), collision checklist;

Immediate actions

Zero pitch on combinators.

Call master.

Check all watertight doors closed.

Make signal and announcement for General Emergency Stations.

## **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 PRE-COLLISION ACTIONS

#### 2.2.1 European Tideway

*European Tideway*'s OOW was in little doubt throughout the whole incident that *Vrouw Grietje* was engaged in fishing within the meaning of Rule 3 (d) of the *International Regulations for Preventing Collisions at Sea.* Although neither he, nor anyone else on *European Tideway*, could recall seeing any fishing day signal as required by Rule 26 (b) he did see gear hanging from the beams and assumed the vessel was engaged in fishing. This required *European Tideway* to keep out of the way of *Vrouw Grietje* in accordance with Rule 18.

The initial bow crossing posed no risk of collision. No action was required by *European Tideway*, and *Vrouw Grietje* passed safely about 2 miles ahead.

The subsequent alteration by the fishing vessel brought her back into a crossing situation with *European Tideway* and this time did involve a possibility of risk of collision, requiring action by the ferry.

After the fishing vessel's alteration was observed from the bridge of *European Tideway* and reported by the seaman, the OOW had to establish, first, whether a risk of collision existed and second, if so, what action to take.

When the alteration was reported, the two second officers had begun their handover. This was stopped immediately and was a wise action to take as there was then no doubt over who had the conduct of the navigation. The fact that the handover had started did not impede the actions taken by the OOW and might, in fact, have assisted the bridge team, as there were two extra persons on the bridge to help if required.

One of the seamen was placed at the wheel. This was also wise in the circumstances; manual steering is always preferable in a close quarters situation because the orders can be spoken, away from the steering console, and the response is immediate. The course given to the helmsman was slightly different (3°) to the course being steered by the autopilot as he was told to steer 270° instead of the 273° being steered at the time. This was a minor alteration and probably did not make any significant difference to the situation, but, nevertheless, was still a small alteration of course which <u>could</u> have changed the situation and/or confused the other vessel.

To establish if a risk of collision existed, the OOW first checked the ARPA. He considered the ARPA to be his primary means of collision avoidance, so it was natural he would go to the ARPA first to determine if risk of collision existed. As the fishing vessel had made a large alteration of course, about 180° to starboard, the ARPA's computer was still processing the data and had not yet caught up with the change in course.

For about 20 to 30 seconds the OOW visually observed the approaching fishing vessel and monitored any change in her bearing by reference to a bridge window frame, while standing in the same position on the bridge. This is a crude means of establishing if another vessel's bearing is steady or not. It is not an accurate way of taking relative bearings, and the OOW would have obtained more accurate bearings by using one of the two azimuth mirrors on the bridge. Rule 7 requires all vessels to *"use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists..."*. It was, however, not the usual practice for either of the second officers on the bridge at the time to use the azimuth mirrors for visual bearings.

The ARPA was using ground-based information whereby the course and speed made good over the ground, as opposed to through the water, is input to the radar's computer to enable it to establish the echo's movements. This will give no indication of another vessel's aspect, something on which the collision regulations are based. For anti-collision use, water-based information should always be preferred for indicating a vessel's aspect. The smaller radar was using water-based information and was referred to during the incident. In this instance, it gave similar information to that of the ARPA. Both second officers used the ARPA as their primary means of collision avoidance, and water-based information should have been selected. This practice is especially important in restricted visibility where the other vessel's aspect cannot be determined by visual means.

After it had been interpreted that a risk of collision existed, the OOW had to take avoiding action as the give-way vessel. By this stage, *Vrouw Grietje* was at around 0.5 mile range and, as she was about 3 points on the starboard bow, a substantial alteration to starboard was appropriate. The OOW did order starboard helm, but only 15° initially, quickly followed by 20°. An order of "hard to starboard" at the outset would have been more appropriate and resulted in a larger rate of turn. One short blast, as required by the collision regulations, was sounded when the vessel altered course to starboard.

*European Tideway* could not have been expected to take action to avoid a collision, as required by the collision regulations, any earlier than she did due to *Vrouw Grietje*'s alteration at close range, causing risk of collision to exist. By Rule 7, time is required to assess the situation and, if in doubt, risk of collision should be deemed to exist. The ferry's alteration was, therefore, appropriate in the circumstances despite visual bearings not being taken with the azimuth mirrors. With reference to **Figure 2** it can be seen if *European Tideway* had, in

fact, maintained her course, the two vessels would have passed very close, but would probably not have collided. The fishing vessel would probably have passed close astern of the ferry. Nevertheless, if in doubt, it is <u>always</u> wise to assume risk of collision exists. This view is endorsed in Rule 7(a).

Shortly after *European Tideway* altered course to starboard, *Vrouw Grietje* began to alter course to port.

Once it was realised that *Vrouw Grietje* had altered course to port, the port engine movement was reduced and the starboard engine was put astern. This action was intended to have two effects: first, to increase the swing to starboard and, second, to reduce the speed and hence the force of any impact. As the OOW required the maximum swing to starboard, the helm should have been moved to hard-to-starboard. The reduction in the port engine ahead movement might have reduced the swing that could have been obtained by using the engines, and if the starboard engine had been removed to full astern, more swing would have resulted. The engine adjustments might also have affected the water flow over the rudder. However this adjustment of the engines was not inappropriate in the circumstances, as any reduction in the force of an unavoidable impact will result in less damage and, therefore, less chance of injuries and/or loss of the vessel. There is also a possibility that an extreme manoeuvre might have resulted in an engine overload.

The bow crossing distance was about 2 cables, nevertheless the two vessels collided because *Vrouw Grietje* was swinging to port quicker than *European Tideway* was swinging to starboard. The fishing vessel collided head on to the ferry's port bow.

*European Tideway* sounded a succession of short and rapid blasts on the whistle in compliance with Rule 34 (d) of the collision regulations. The decision to inform the master was appropriate, but was made only a few seconds before the collision and did not allow the master sufficient time to reach the bridge and take any action himself.

#### 2.2.2 Vrouw Grietje

The fishing day signal required by the collision regulations was apparently displayed, although it was not seen by personnel on the ferry. However, as the ferry's OOW considered *Vrouw Grietje* to be a vessel engaged in fishing throughout the incident, whether or not the signal was displayed, is not considered to be a significant factor in this investigation.

The deckhand was alone in the wheelhouse with an ARPA and another radar to assist his watchkeeping. The skipper instructed him regarding when to turn around on to a reciprocal heading. The vessels in the vicinity were discussed before the skipper left the wheelhouse. The skipper also told the deckhand to call him if there were any problems, or if he was in any doubt. *Vrouw Grietje*'s ARPA radar was on 12-mile range and the other radar was on 6-mile range. This was adequate for the circumstances.

When *Vrouw Grietje* had reached the position where the skipper had instructed the deckhand to turn the vessel around, he did so without first checking for other vessels either by radar or visually. He, in effect, turned the vessel "blind". This was in contravention of Rule 5 in that he failed to keep a proper lookout, and was without due regard to the observance of good seamanship. Although *Vrouw Grietje* was engaged in fishing and, therefore, not normally required to keep out of the way of a power-driven vessel, she altered her course into a potential collision situation. This was an unwise and dangerous action to take, and was contrary to the provisions of Rule 2(a). It is not known why the deckhand did not check for other vessels before altering course.

During the initial "blind" alteration of course to starboard, *European Tideway* was observed by the deckhand. He could have steadied his course on to a north-easterly heading and allowed the ferry to pass clear, before coming around to the required south-easterly heading. He decided, however, to continue with his intended manoeuvre; it is not known why.

Although *European Tideway* was obliged to keep out of the way of *Vrouw Grietje*, the alteration into a potential collision situation left the ferry with little time to assess the situation and to take avoiding action.

The fishing vessel's final alteration of course to port made the collision unavoidable. If this alteration had not been made, then *European Tideway* would have almost certainly avoided collision because of her own starboard alteration, and a close passing of about one cable would have resulted. As *Vrouw Grietje* had crossed her bow before the collision, *European Tideway*'s alteration would have been sufficient.

*Vrouw Grietje*'s alteration to port was made after the start of the ferry's alteration to starboard. One short blast was sounded by *European Tideway* as she altered course which, because of the short range involved, should have been audible in the wheelhouse of the fishing vessel. It is doubtful therefore, if the meaning and/or significance of this signal was known to the deckhand. If it had been, he would probably not have altered course to port.

The deckhand made the final alteration to port intending to pass around the ferry's stern when he became aware of the possibility of risk of collision. He was concerned that if he went to starboard he would be struck from astern by the ferry. However the alteration was far too late and too close to allow the ferry to be aware of his intentions, and was also made after the ferry had begun altering course to starboard. This could be construed as action being taken to avoid collision by the stand-on vessel under Rule 17. However *Vrouw Grietje*'s action, in altering course to port, made the situation worse and the collision unavoidable.

The skipper's action in putting the engines of the fishing vessel astern might have reduced the impact and prevented further damage. The impact of the two vessels was, however, still sufficient to tear a substantial hole in the ferry's bow.

The actions of the deckhand on *Vrouw Grietje* calls into question his competence as a single watchkeeper of a fishing vessel in such busy waters. He was qualified to keep watch alone, and had been doing so for two months before the collision. A more experienced watchkeeper might have kept a better lookout and not altered course into a potential collision situation. The deckhand appeared to be completely focused on altering course and carrying out the skipper's instructions to turn around in the pre-set position. He did not consider the proximity of other vessels. The skipper had given instructions regarding the alteration, but it is not known how clear they were, particularly regarding the effect the alteration could have on other vessels.

#### 2.3 POST-COLLISION ACTIONS

#### 2.3.1 European Tideway

Once the master had reached the bridge and established what had happened, he sent personnel forward to check for damage. At that time it was unclear how serious the damage was to his vessel and if there were any injuries. It would have been prudent to call the crew and passengers to general emergency stations, and have all personnel accounted for and wearing lifejackets. Ro-ro ferries, similar in design to *European Tideway*, can quickly become unstable with just a small amount of water on the car deck. When it had been established that the situation was not serious, the crew and passengers could have been stood down. However, the master decided to wait for the damage to be assessed before sounding the alarm and/or making an announcement. A short announcement would at least have alerted the passengers and crew in case they were required to go to muster stations. The bridge procedures guide checklist C2, action numbers 1 and 6, refer to the above as actions to be carried out (see 1.9). P&O North Sea Ferries' ship casualty procedures collision checklist refers to an immediate action of *Make signal and announcement for General Emergency Stations* (see 1.10).

In the event of a collision, it is necessary for the watertight doors to be closed promptly to minimise the effect of any flooding on stability. This is a basic part of damage control in any vessel. When the master arrived on the bridge he was under the impression the watertight doors were closed, but he was not entirely sure. Neither of the second officers attempted to close them. Eventually the doors were closed from the engine room about 5 minutes after the impact. The master could have ensured they were closed by instructing either of the second officers to close them, or by going directly to the panel himself. If the damage had been more serious, the few minutes which elapsed between the collision and the actual time of all the watertight doors being closed could have been critical. The bridge procedures guide checklist C2, action number 3, has the above mentioned as action to be carried out in the event of a collision (see 1.9).

P&O North Sea Ferries' ship casualty procedures collision checklist refers to the above mentioned as an immediate action to be carried out in the event of a collision.

Both of the second officers were well rested. There is no evidence that fatigue, alcohol or drugs played any part in this accident.

#### 2.3.2 Vrouw Grietje

After the collision, *Vrouw Grietje*'s skipper made contact with *European Tideway* and exchanged information. He checked the damage to his vessel and, having established damage was minimal, opted to continue fishing for the remainder of the week. He could have taken his vessel back to port for a damage assessment to be made alongside. This would have been prudent bearing in mind the impact with a larger vessel and the damage sustained by *European Tideway*.

#### 2.4 VOYAGE DATA RECORDER

The VDR on *European Tideway* functioned correctly and provided information of great assistance to the investigation. The raw radar data was clear and showed the actions of both vessels clearly.

The radio news programme which the second officer was listening to prior to the collision, obscured the majority of voice and other sounds made on the bridge during this time. The sound recordings recorded by the VER 2000 were, therefore, of little use in this investigation. Listening to commercial radio broadcasts on the bridge can obscure VHF radio messages made by coast radio stations or other vessels.

The decision to fit the VDR on *European Tideway* was made by P&O North Sea Ferries. It was a decision fully and enthusiastically supported by the MAIB. P&O North Sea Ferries should ensure that procedures are in place which allow bridge voice recordings to be made without any interference from other sources, and review the location of the microphones for optimum audio quality.

## **SECTION 3 - CONCLUSIONS**

#### 3.1 FINDINGS

#### 3.1.1 European Tideway

- 1. *European Tideway* and *Vrouw Grietje* collided at 1458 BST on 16 October 2000 in position 52°03.36'N 02°30.73'E. [1.5.4]
- 2. *European Tideway* had valid certification at the time of the collision and she was manned in accordance with her safe manning certificate. [1.1]
- 3. *European Tideway*'s OOW was using ground-based information on the ARPA which was considered to be the primary means of collision avoidance. [1.3.1, 1.5.2, 2.2.1]
- 4. *Vrouw Grietje* was observed with gear hanging from her beams and was considered by the OOW on *European Tideway* to be a vessel engaged in fishing throughout the incident. [1.5.2, 2.2.1]
- 5. When *Vrouw Grietje* made the 180° alteration to starboard the two second officers on *European Tideway* were handing over the watch. The watch handover was not found to be a contributory factor to the collision. [1.5.3, 2.2.1]
- 6. European Tideway observed the alterations made by Vrouw Grietje, and was keeping a proper lookout throughout the incident. [1.5.3, 2.2.1]
- 7. *European Tideway* changed to manual steering when it was reported that the fishing vessel had turned around. [1.5.3, 2.2.1]
- 8. Visual bearings using the azimuth mirrors on *European Tideway* were not used to determine if a risk of collision existed. [1.5.3, 2.2.1]
- 9. When it was interpreted that a risk of collision existed, *European Tideway*'s OOW put the helm to starboard 15°, quickly followed by starboard 20°. Maximum helm to starboard was not used. [1.5.3, 2.2.1]
- 10. When *Vrouw Grietje* was seen to be altering course to port, *European Tideway*'s OOW reduced the port engine ahead movements and placed the starboard engine astern. No further helm orders were made. [1.5.4, 2.2.1]
- 11. *European Tideway*'s OOW sounded manoeuvring and warning signals on the ship's whistle in compliance with the collision regulations. [1.5.3, 1.5.4, 2.2.1]
- The master of *European Tideway* was called a few seconds before the collision. This did not allow him sufficient time to reach the bridge and take any action. [1.5.4, 2.2.1]

- 13. Vrouw Grietje collided bow-on to European Tideway's port bow while the ferry was turning to starboard and the fishing vessel turning to port. [1.5.4]
- 14. Not all *European Tideway*'s watertight doors were closed immediately after the collision. [1.5.5, 2.3.1]
- 15. After the collision the general emergency alarm on *European Tideway* was not sounded, and no announcement was made. [1.5.5, 2.3.1]
- 16. Three of the actions referred to in the bridge procedures guide checklist C2, "collisions", were not carried out immediately. Two of these actions are also contained in the owner's ship casualty procedure collision checklist. [1.5.5,2.3.1]
- 17. The voice recording on the VDR was obscured by a radio broadcast being listened to on the bridge, before the collision. [1.6,2.4]
- 18. European Tideway sustained a 6 x 1.5m gash in her bow as a result of the collision. There were no injuries or pollution. [1.5.5]
- 19. The collision was witnessed by a nearby vessel, *Autoprogress*, which was fitted with a VMS. [1.5.5,1.7]
- 3.1.2 Vrouw Grietje
- 1. Vrouw Grietje was engaged in fishing throughout the incident. [1.5.2]
- 2. Vrouw Grietje was equipped with an ARPA radar and another radar. [1.3.2]
- 3. The skipper left the deckhand instructions regarding when to alter course, and when to call him. [1.5.2]
- 4. The deckhand was qualified to be a watchkeeper. [1.2]
- 5. The deckhand had two months' experience as a sole watchkeeper. [1.2, 2.2.2]
- 6. *Vrouw Grietje* safely crossed the bow of *European Tideway* the first time without incident. [1.5.3]
- 7. The deckhand altered course, at the position previously instructed to him by the skipper, without first making a check for other traffic either visually or by radar. He, in effect, turned the vessel "blind". The alteration involved turning about 180° to starboard. [1.5.3, 2.2.2]
- 8. *European Tideway* was first observed during the alteration, but the deckhand decided to continue with his action. [1.5.3, 2.2.2]
- 9. The alteration made by *Vrouw Grietje* developed into a situation involving an interpreted risk of collision and did not leave *European Tideway* enough time to assess the situation and to take avoiding action. [1.5.3, 2.2.2]

- 10. The one short blast, made by *European Tideway* as she altered to starboard, was probably audible in V*rouw Grietje*'s wheelhouse, but the deckhand did not, apparently, appreciate its meaning and/or significance. [2.2.2]
- 11. Vrouw Grietje made an alteration of course to port just after European Tideway had altered course to starboard. [1.5.4, 2.2.1, 2.2.2]
- 12. The skipper was called just before the collision and put the engines astern. [1.5.4, 2.2.2]
- 13. *Vrouw Grietje* suffered slight damage to her bow and forward handrails as a result of the collision. There were no injuries or pollution. [1.5.5]
- 14. Following an onboard damage assessment, *Vrouw Grietje*'s skipper decided to continue fishing for the remainder of the week. [1.5.5, 2.3.2]
- 15. The MAIB received no response from *Vrouw Grietje*'s owner to requests for information during the course of this investigation, and was therefore unable to establish some further details. [1.1]

#### 3.2 CAUSE

The initiating cause of the collision was *Vrouw Grietje*'s watchkeeper altering course, resulting in an interpreted risk of collision with *European Tideway*.

#### 3.2.1 Contributory causes

- 1. *Vrouw Grietje's* watchkeeper altered course "blind" and did not check for other vessels either visually or by radar. It is not known why. [2.2.2]
- 2. *Vrouw Grietje's* watchkeeper failed to maintain a proper lookout in accordance with Rule 5 of the Collision Regulations. [2.2.2]
- 3. *Vrouw Grietje's* watchkeeper had been instructed by the skipper to turn at a predetermined position. [2.2.2]
- 4. *Vrouw Grietje's* course alteration resulted in an interpreted risk of collision. [2.2.1]
- 5. *Vrouw Grietje's* watchkeeper continued with his turn when he saw *European Tideway*. It is not known why. [2.2.2]
- 6. *Vrouw Grietje's* watchkeeper failed to take precautionary measures in accordance with Rule 2 (a).
- 7. *European Tideway*'s OOW altered course to starboard in accordance with Rule 18. [2.2.1]
- 8. *Vrouw Grietje's* watchkeeper altered course to port to avoid a collision with *European Tideway*. [2.2.2]

- 9. European Tideway did not expect Vrouw Grietje to alter course. [2.2.1]
- 10. European Tideway's OOW was left with little time to assess and act. [2.2.1]
- 11. *European Tideway*'s OOW's choice not to alter hard to starboard, or full astern starboard, probably reduced his ability to avoid a collision. [2.2.1]

# **SECTION 4 - RECOMMENDATIONS**

#### P&O North Sea Ferries is recommended to:

- 1. Establish procedures to ensure that water-based information is input into any radar being used primarily for collision avoidance.
- Consider amending P&O North Sea Ferries' ship casualty procedures collision checklist 3 (a) to include <u>all</u> of the actions as contained in the emergency checklist C2 in the *Bridge Procedures Guide*, in particular action 6; "mustering passengers".
- 3. Draw to the attention of its fleet the lessons arising from this accident, including the need to follow emergency checklists.
- 4. Establish procedures which ensure, where possible, azimuth mirrors are used to obtain visual bearings, especially for checking if risk of collision exists.
- 5. Establish procedures to ensure that VDR bridge voice recordings can be made without any interference from other sources which may obscure them, and review the location of the microphones for optimum audio quality.
- J. Van Dam & Zonen is recommended to:

Review watchkeeping procedures to ensure:

- 6. A proper lookout is maintained at all times.
- 7. Watchkeepers are sufficiently competent to comply fully with the *International Regulations for Preventing Collisions At Sea.*
- 8. That instructions are in place to reflect clearly the skipper's expectations concerning watchkeeping, particularly when about to negotiate a planned change of course, speed or fishing activity.

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#### Extracts from the International Regulations for Preventing Collisions at Sea 1972

#### 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 3 - General Definitions

(d) The term "vessel engaged in fishing" means any vessel fishing with nets, lines, trawls or other fishing apparatus which restrict manoeuvrability......

#### Rule 5 - Lookout

Every vessel shall at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and 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 longrange 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 taken to avoid collision 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 alteration 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 time to assess the situation, a vessel shall slacken her speed or take all way off by stopping or reversing her means of propulsion....

#### 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.

#### Rule 18 - Responsibilities between vessels

Except where Rules 9, 10 and 13 otherwise require -

- (a) A power-driven vessel underway shall keep out of the way of:-
- *i.* a vessel not under command;

- ii. a vessel restricted in her ability to manoeuvre;
- ili. a vessel engaged in fishing;
- iv. a sailing vessel......

#### Rule 26 - Fishing vessels

(a) A vessel engaged in fishing, whether underway or at anchor, shall exhibit only the lights and shapes prescribed in this Rule.

(b) A vessel when engaged in trawling, by which is meant the dragging through the water of a dredge net or other apparatus used as a fishing appliance, shall exhibit:-

two all-round lights in a vertical line, the upper being green and the lower white, or a shape consisting of two cones with their apexes together in a vertical line one above the other; a vessel of less than 20 metres in length may instead of this shape exhibit a basket;

#### Rule 34 - Manoeuvring and warning signals

(a) When vessels are in sight of one another, a power-driven vessel underway, when manoeuvring as authorised 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" ....

(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....

#### ANNEX B

#### Checklist C2 from the Bridge Procedures Guide

C2 Collision

Action to be carried out:

Sound the general emergency alarm

- Manoeuvre the ship so as to minimise effects of collision
- Close watertight doors and automatic fire doors
- Switch on deck lighting at night
- Switch VHF to Channel 16 and, if appropriate, to Channel 13
- Muster passengers, if carried, at emergency stations
- Make ship's position available to radio room/GMDSS station, satellite terminal and other automatic distress transmitters and update as necessary
- Sound bilges and tanks after collision
- Check for fire/damage
- Offer assistance to other ship
- Broadcast DISTRESS ALERT and MESSAGE if the ship is in grave and imminent danger and immediate assistance is required, otherwise broadcast an URGENCY message to ships in the vicinity.