ACCIDENT REPORT

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

Report on the investigation of

the flooding and foundering of the stern trawler

Opportune (LK 209)

approximately 36 nautical miles east of Lerwick, Shetland Islands, Scotland

on 24 March 2024

VERY SERIOUS MARINE CASUALTY REPORT NO 3/2026 JANUARY 2026

The United Kingdom Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2012 – Regulation 5:

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

NOTE

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

Front cover image courtesy of Calum Gray (MarineTraffic).

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

°C	-	degrees Celsius
CoC	-	Certificate of Competency
DSC	-	digital selective calling
EPIRB	-	Emergency Position Indicating Radio Beacon
HMCG	-	His Majesty's Coastguard
m	-	metre
m^3	-	cubic metre
mm	-	millimetre
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
MSIS	-	Marine Survey Instructions for the Guidance of Surveyors
MSN	-	Merchant Shipping Notice
nm	-	nautical mile
RNLI	-	Royal National Lifeboat Institution
SAN	-	surveyor advice note
SAR	-	search and rescue
t	-	tonne
VHF	-	very high frequency

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

SYNOPSIS

At about 0530 on 24 March 2024, the 23.95m UK registered stern trawler *Opportune* foundered 36 miles east of Lerwick, Scotland. *Opportune*'s eight crew were later rescued uninjured from the vessel's liferafts by coastguard helicopters.

Around 45 minutes before *Opportune* foundered, the mate had gone to the engine room to investigate a bilge alarm and found water ingress that had reached the level of the vessel's gearbox. The mate immediately informed the skipper and they went together to the engine room a few minutes later, but decided it was unsafe to enter the space as it was filled with white odourless vapour. *Opportune*'s crew abandoned ship into the liferafts and the vessel foundered shortly afterwards.

The investigation determined that *Opportune* foundered due to an uncontrolled engine room flood. The source of the flood could not be definitively established but the most likely cause was failure of the vessel's seawater pipework, some of which could have been in place since the 26-year-old vessel was built.

There was no opportunity for the flood to be contained or controlled once the engine room became unsafe to enter because *Opportune*'s sea inlet valves and electric bilge pumps could not be operated from outside the space. Faced with a rapidly sinking vessel, *Opportune*'s skipper raised the alarm and the crew abandoned ship in good time.

Recommendations have been made to the Maritime and Coastguard Agency to update its guidance to surveyors, vessel owners and crew on fishing vessel seawater pipework systems in existing vessels. Recommendations have also been made to *Opportune*'s owner to ensure that its crews regularly drill their response to a flood and understand the seawater pipework system.

SECTION 1 – FACTUAL INFORMATION

1.1 PARTICULARS OF *OPPORTUNE* AND ACCIDENT

VESSEL PARTICULARS	
Vessel's name	*Opportune*
Flag	UK
Classification society	Not applicable
IMO number/fishing numbers	9191060 / LK 209
Type	Stern trawler
Registered owner	Quiet Waters Fishing Company Limited
Manager(s)	Quiet Waters Fishing Company Limited
Construction	1998
Year of build	Steel
Length overall	27.85m
Registered length	23.95m
Gross tonnage	331
Minimum safe manning	Not applicable
Authorised cargo	Not applicable

VOYAGE PARTICULARS	
Port of departure	Scalloway, Shetland Islands, Scotland
Port of arrival	Peterhead, Scotland (intended)
Type of voyage	Coastal
Cargo information	Not applicable
Manning	8

MARINE CASUALTY INFORMATION	
Date and time	24 March 2024 at about 0530
Type of marine casualty or incident	Very Serious Marine Casualty
Location of incident	60° 16.6N 000° 02.3E, approximately 36nm east of Lerwick, Shetland Islands, Scotland
Place on board	Engine room
Injuries/fatalities	None
Damage/environmental impact	Total loss/minimal pollution
Vessel operation	On passage
Voyage segment	Mid-water
External & internal environment	Northerly force 6; visibility moderate to good, accompanied by a 2m swell
Persons on board	8

1.2 NARRATIVE

At 0100 on 20 March 2024, the stern trawler *Opportune* departed Scalloway, Shetland Islands, Scotland for fishing grounds to the east, where it fished for the next 3 days.

At about 1800 on 23 March, while hauling nets approximately 100 nautical miles (nm) north-east of Lerwick, Shetland Islands **(Figure 1)**, *Opportune*'s tailshaft[1] high temperature alarm sounded in the wheelhouse. The mate went to the engine room to investigate and used an infrared thermometer to find that the stern seal was running hotter than the normal running temperature. The mate informed the skipper, who directed the crew to haul the fishing gear and then stopped the main engine to allow further investigation.

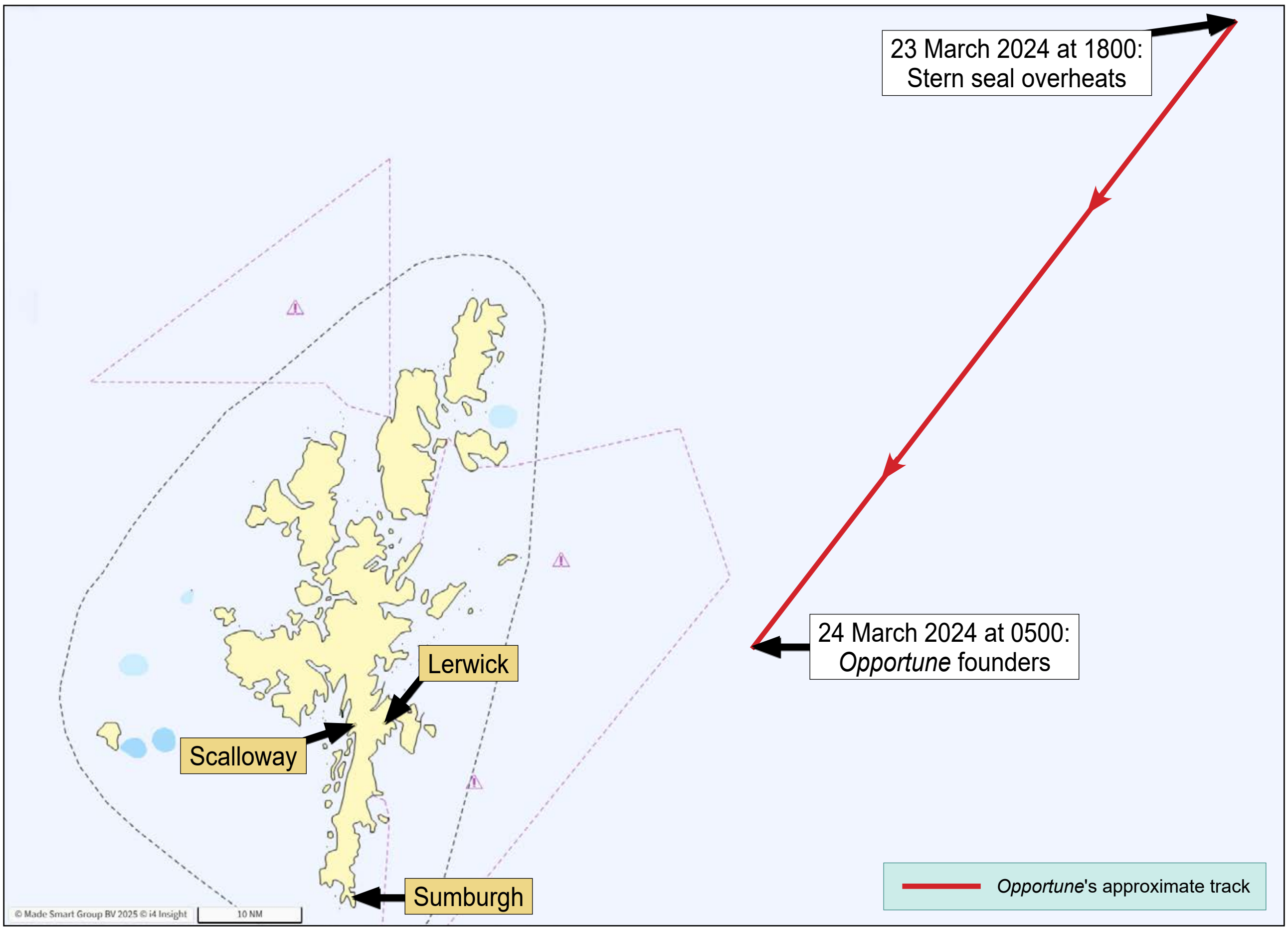

Figure 1: Position of *Opportune* when stern tube issues occurred and location of foundering

Finding that some of the stern seal oil had emulsified, the crew checked the oil pipes and replaced the stern seal oil. The skipper discussed the stern seal issue with *Opportune*'s owner ashore and it was decided that the vessel should stop fishing and proceed to Peterhead, Scotland, where it could be taken out of the water and the tailshaft inspected.

An hour later, with the fishing gear recovered and the skipper on watch, *Opportune* started its passage to Peterhead. For the first hour of the passage the crew monitored the stern seal and tailshaft temperature every 10 minutes,

[1] Also known as a drive shaft or propeller shaft.

before reverting to checks every 30 minutes for the next 2 hours. Then, with the temperature consistently below 40°C, the crew checked the tailshaft and stern seal temperature every hour. Shortly after midnight, the mate went to the wheelhouse and took over the navigational watch from the skipper, who then went to their cabin to rest.

At about 0445 on 24 March, the mate noticed that the engine room bilge alarm had activated in the wheelhouse and went to the engine room to investigate. Before reaching the bottom of the engine room ladder the mate saw that water was entering the engine room and was level with the vessel's gearbox, with spray splashing up from the tailshaft as it rotated. The mate observed that the water appeared to be originating from below the floor plates and left the engine room to inform the skipper.

A few minutes later, the mate returned to the engine room with the skipper. On opening the door to the space, the mate and the skipper found it filled with white odourless vapour and decided it was unsafe to enter. The skipper directed that they should both go to the wheelhouse, alert the crew and prepare to abandon ship. On arrival in the wheelhouse, the skipper sounded the crew emergency alert and made an announcement for all crew to immediately collect their lifejackets and immersion suits from the forecastle locker **(Figure 2)** and muster in the wheelhouse. At 0458, the mate operated the digital selective calling (DSC)[2] distress alert on the vessel's very high frequency radio (VHF) and informed all ships that *Opportune* was taking on water. The vessel lost propulsion and electrical power shortly afterwards.

By approximately 0510, *Opportune*'s eight crew were mustered in the wheelhouse; all were wearing lifejackets and two had donned immersion suits. The skipper then ordered the mate to launch the port side 10-person liferaft and, once inflated, for the crew to abandon ship. *Opportune* was now drifting, with its bow pointing east. The wind was northerly force 6 and the vessel was rolling in the 2m swell from the same direction. The sea surface temperature was about 8°C and morning twilight was at 0509; the conditions were getting lighter.

The mate launched the port side liferaft and tended the painter, while the six deckhands jumped from *Opportune*'s upper deck to board the inflated liferaft. Once the deckhands had all embarked, the skipper activated the vessel's Emergency Position Indicating Radio Beacon (EPIRB) and passed it into the liferaft along with the vessel's flares. Shortly afterwards, as *Opportune* rolled, the liferaft's painter was snatched from the mate's hand and the line quickly payed out and parted.

As the port side liferaft drifted away from *Opportune*, the skipper and mate quickly launched, inflated and boarded the starboard side liferaft. They then cut the painter and the liferaft was blown down the fishing vessel's starboard side. With *Opportune* sinking by the stern and listing to starboard, the liferaft briefly caught on the vessel's bulbous bow before being blown clear.

Ashore, His Majesty's Coastguard (HMCG) Orkney & Shetland received *Opportune*'s DSC distress alert[3] and relayed the vessel's distress message to all ships. HMCG then attempted to contact *Opportune* without success and scrambled its search and rescue (SAR) helicopter from Sumburgh Airport. HMCG also ordered

[2] A digital alerting system that, on the press of a single button, can send a vessel's identity, position and the nature of its distress to all DSC-equipped vessels and shore stations within range.

[3] HMCG initially misidentified *Opportune* by its former name *Beryl*.

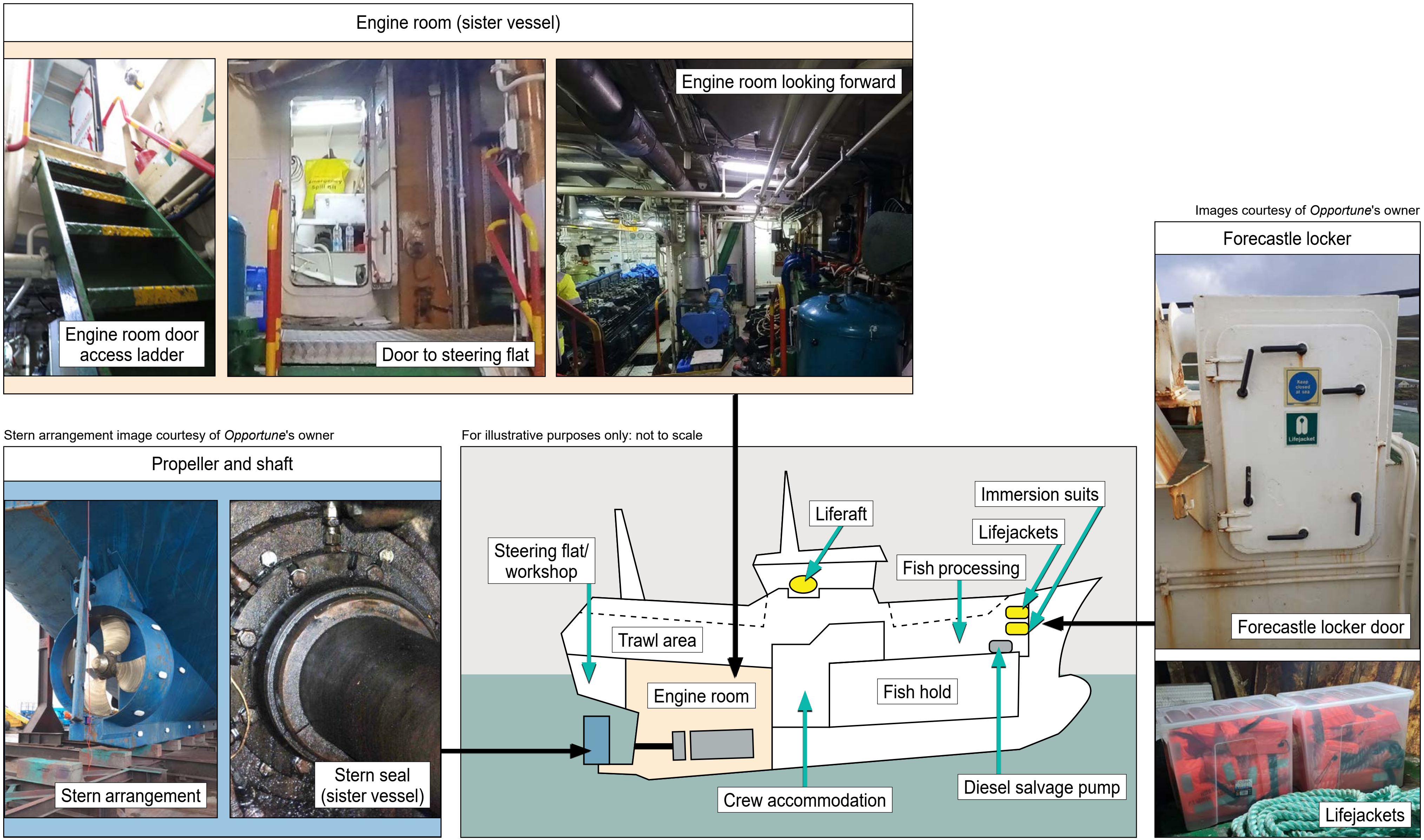

Figure 2: *Opportune*'s general arrangement

the Royal National Lifeboat Institution (RNLI) Lerwick Lifeboat Station all-weather lifeboat to launch. A nearby Norwegian Coast Guard SAR helicopter offered assistance and was tasked by HMCG to assist with the rescue of *Opportune*'s crew.

At approximately 0530, *Opportune* sank by the stern. Its bow remained afloat for the next 10 to 15 minutes before the vessel disappeared completely, leaving a small oil slick and a few fish boxes floating on the surface.

At 0556, the HMCG SAR helicopter crew, guided by *Opportune*'s EPIRB signal, reported that they could see the two liferafts. There was no sign of the fishing vessel. The Norwegian Coast Guard SAR helicopter arrived shortly afterwards, and both aircraft started winching *Opportune*'s crew from the two liferafts. By 0623, the helicopters had rescued all eight of *Opportune*'s crew.

At 0700, the two SAR helicopters landed at Sumburgh Airport. Once disembarked, *Opportune*'s crew were medically examined before being released.

1.3 WRECK

Opportune foundered approximately 36nm east of Lerwick, Shetland Islands in over 100m of water **(Figure 1)**. The wreck was not examined by the investigation due to its remote location. The owner's records for *Opportune* were kept on board and were lost when the vessel sank.

1.4 *OPPORTUNE*

1.4.1 Overview

Opportune[4] was a steel-hulled stern trawler, built in 1998 in Spain. Since October 2020, the vessel had been owned by Quiet Waters Fishing Company Limited (the owner) and was operated out of Scalloway, Shetland Islands. *Opportune* was operated as an *existing vessel* under the Maritime and Coastguard Agency (MCA) Merchant Shipping Notice (MSN) 1872 (F) Amendment 1[5].

1.4.2 Crew

Opportune's skipper held a Deck Officer Class 2 (Fishing) Certificate of Competency (CoC). The mate, who also acted as the vessel's engineer, was studying for their Deck Officer Class 2 (Fishing) CoC. The remainder of the crew comprised six deckhands, all of whom held the appropriate certificates for their role.

1.4.3 Safety management system

Opportune's safety management system was documented in its safety folder, which had been compiled using the online SafetyFolder[6] format. The safety folder included the vessel's safety policies; crew induction details; the muster plan and

[4] The vessel had previously been named: *Harvest Moon IV* (FR366), *Northlantean II* (K508), and *Beryl* (BF440).

[5] The Code of Safe Working Practice for the Construction and Use of Fishing Vessels of 15m Length Overall to less than 24m Registered Length.

[6] A website designed by a committee of users and fishing organisations to help fishing vessels comply with UK and European maritime regulations.

drills; risk assessments; and equipment inspection schedules. The safety folder did not include a maintenance or inspection plan for the vessel's pipework or bilge pumping arrangements.

Opportune's crew conducted monthly emergency drills simulating the response to various scenarios, including a person overboard, abandon ship and fire. These drill scenarios did not include responding to a flood.

Opportune's safety folder contained 52 risk assessments. Two of the risk assessments were titled *sea inlet valve failure and damage to stern during trawling*, for which flooding was identified as the hazard. *Opportune*'s safety folder did not contain risk assessments for failure of the vessel's tailshaft or seawater pipework.

1.4.4 Engine room

Opportune's engine room was located below the main deck, at the stern **(Figure 2)**. The engine room was the largest compartment on board and most of the space was below the waterline. The engine room had forward and aft entrances accessed from the main deck via watertight doors. The steering flat/workshop was situated aft of the engine room and accessed via a watertight door in the aft engine room bulkhead; this door was normally left open.

Opportune was fitted with a single main engine that operated through a gearbox to drive a four-blade variable pitch propeller. The propeller was located inside a nozzle positioned immediately in front of the vessel's rudder **(Figure 2)**. The port and starboard electrical generators were located on either side of the engine room on top of the freshwater tanks, which created a well under the main engine.

1.4.5 Hull

At build, *Opportune*'s steel hull plating in the engine room was 12mm thick at the keel and 8mm to 10mm thick at the waterline. To slow the degradation of the vessel's hull, underwater fittings and pipework, the hull had been fitted with sacrificial zinc anodes[7] and an impressed current cathodic protection system[8]. The anodes had last been replaced in November 2022.

1.4.6 Seawater pipework and valves

Opportune had a cross-vessel main seawater suction pipework system comprised of 200mm diameter galvanised[9] steel pipe. This pipework was connected to cast iron sea inlet valves located on either side of the main engine below the turn of bilge. Each inlet valve had a sea strainer and isolating valve fitted downstream. The sea suction pipework had two branches feeding the engine cooling system and the electric deck wash/bilge pumps. One branch of the pipework was 150mm diameter and the other was 125mm diameter **(Figure 3)**. The 200mm diameter pipework and associated valves and strainers were fitted below the engine room deck plating, approximately 4m below the vessel's waterline. The tailshaft, rudder stock and sea inlet valves were the only hull penetrations below the waterline. The seawater inlet pipework arrangement was as originally fitted at build.

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[7] An electrically connected piece of sacrificial metal, typically zinc or aluminium, used to protect a vessel's hull from saltwater corrosion.

[8] An electrical process that prevents hull corrosion by forcing an external direct current to flow onto the vessel's hull.

[9] Metal that has been dipped in a protective zinc coating to prevent rust and corrosion.

Opportune's sea inlet valves were opened and closed by hand wheels located below the engine room floor plates. The hand wheels were operated with portable extension spindles inserted through flaps in the floor plates **(Figure 4)**. The handles were stowed close to the port and starboard generators when not in use. The floor plates above the sea inlet valve positions were not marked to show the position of the valves below. No plans of the space were located close to *Opportune*'s engine room entrances to show the positions of the bilge pump controls or sea inlet valves.

For illustrative purposes only: not to scale

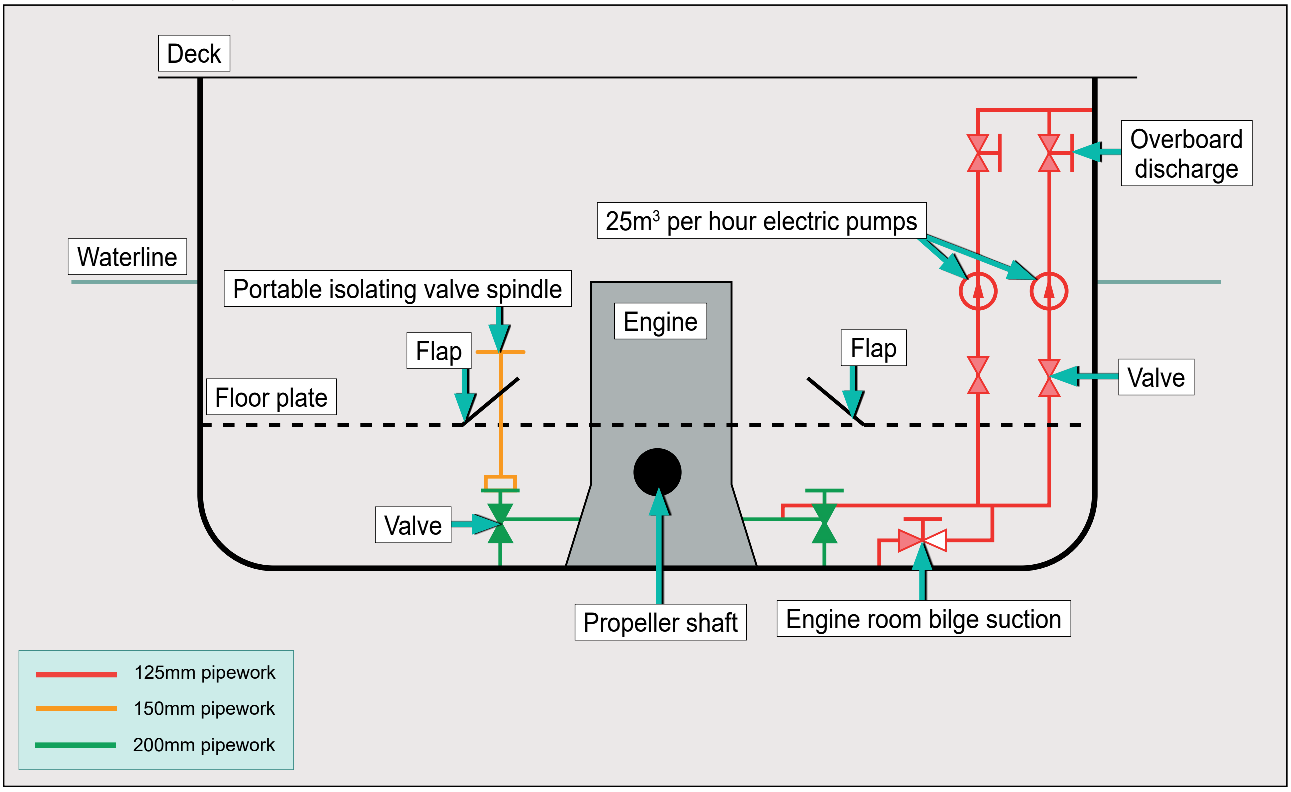

Figure 3: Simplified diagram of *Opportune*'s seawater pipework and bilge arrangements

Figure 4: Example of portable extension spindle fitted to the sea inlet valve below the engine room floor plate

1.4.7 Engine room bilge alarms and pumps

Opportune's engine room bilges were fitted with two independent bilge alarms. The alarm sensors were at the aft end of the compartment below the stern seal. Both bilge alarms would sound in the wheelhouse when activated.

Opportune was fitted with two electric bilge pumps, each with a rated water pumping capacity of $25m^3$ per hour and powered by the vessel's electrical generators. The pumps were started and stopped from within the engine room, with no means of remote operation. *Opportune* was also fitted with a hand bilge pump that had a water pumping capacity of approximately $8m^3$ per hour for use in the event of a loss of electrical power.

Opportune also carried a portable diesel-driven salvage pump, which was stowed at the forward end of the fish processing space above the fish hold. The pump was heavy and needed two crew to move it. Once the portable salvage pump was in position, the suction hose would be lowered into the space to be pumped out before the pump was started manually. The pumping capacity of the portable salvage pump was reported to be about $8m^3$ to $10m^3$ per hour.

1.4.8 Vessel inspection history

Opportune's owner was responsible for the seaworthiness of the vessel and, in line with MSN 1872 (F) Amendment 1, was required to present the vessel for a 5-yearly renewal survey and for inspection at the mid-point in the survey cycle. As the certifying authority for *Opportune*, the MCA was responsible for examining the vessel to determine its compliance with MSN 1872 (F) Amendment 1 and issuing the appropriate certificates. Since the owner's purchase of *Opportune* in 2020, the vessel had completed both a mid-point inspection and a 5-yearly renewal survey.

The one-day mid-point inspection, completed in October 2020, was conducted while *Opportune* was alongside at Scalloway. The MCA surveyor witnessed a fire, person overboard and abandon ship drill and identified 38 deficiencies during the survey, including that:

- the pipework was leaking and required repair
- the impressed current cathodic protection system was not working
- lifejackets were not stowed in a readily accessible location.

Opportune's owner emailed the MCA with photographs as evidence that all the reported deficiencies had been addressed, and the deficiencies were closed out by the MCA.

The 5-yearly renewal survey, completed in November 2022, was conducted at Fraserburgh, Scotland. The survey comprised a one-day out of water inspection, followed 6 days later by a one-day in-water inspection and inclining test. The MCA surveyor recorded their observations in the *Report of Hull Condition of a Fishing Vessel*, noting that:

- Internal and external hull plating appeared in *good condition* for the age of the vessel. Hull thickness measurements had been completed by a local contractor 6 months before the survey and approved as compliant.

- Tailshaft and rudder clearances had been independently inspected by a local shipyard and were within tolerance.

- Sea valves had been overhauled, inspected and found satisfactory by a local shipyard before being refitted into the vessel.

- The inclining test had confirmed that the guidance within the vessel's Stability Information Booklet remained valid.

Opportune's Report of Hull Condition certificate did not comment on the condition of the vessel's seawater pipework.

1.4.9 Previous grounding and pipework inspection

On 21 August 2023, *Opportune* had grounded while moving berths in Fraserburgh Harbour, resulting in a vehicle tyre becoming entangled in the vessel's propeller. *Opportune* was taken out of the water and the vessel's tailshaft was removed, inspected and repaired.

Opportune's owner employed a local contractor to inspect the engine room pipework while the vessel was out of the water. The contractor removed some sections of the vessel's seawater pipework from on top of the fuel tanks for cleaning and inspection before they were replaced. Due to the pipe arrangement beneath *Opportune*'s floor plates, the main pipework ring feeding the system was left in place and power washed and rodded to clear mussel growth.

1.5 REGULATION AND GUIDANCE

1.5.1 Merchant Shipping Notice 1872 (F) Amendment 1

The requirements for seawater systems, including pipework and inlet valves in new[10] and existing 15m to 24m fishing vessels, were set out in MSN 1872 (F) Amendment 1[11].

On pipework construction for new vessels, section 4.1.11, of the MSN stated that:

- *sea water piping…shall be of aluminium bronze, cupro-nickel or similar corrosion resistant material.*

- *'Heavy wall'*[12] *mild steel pipe for 'cross vessel' inlet mains may be used, provided that the internal diameter is 100 millimetres or greater and the pipe is galvanized internally after all fabrication work is complete.*

Section 4.1.11 of the MSN further stated that:

> *existing vessels shall be fitted with such arrangements whenever seawater pipework is renewed.*

[10] Vessels built, or subject to substantial modification, on or after 31 December 2018.

[11] MSN 1872 – Amendment 1 The Code of Safe Working Practice for the construction and use of fishing vessels of 15m length overall to less than 24m.

[12] Heavy wall pipework is generally considered to have a diameter-to-wall thickness ratio of less than 20.

On sea inlet valves for new vessels, section 2.2.6 of the MSN required that:

In machinery spaces, controls for main and auxiliary sea inlets essential for the operation of machinery may be controlled locally. The controls shall be readily accessible, above the floor plates, and be provided with indicators showing whether the valves are open or closed.

And for existing vessels:

If valves are not fitted above the floor plates, rapid and practical means shall be provided to allow for the valve to be operated from floor plate level. If valves are fitted in wells, extended spindles shall be fitted to a higher level to enable their accessibility if flooding occurs.

Further, that:

Existing vessel arrangements will continue to be acceptable provided that valves fitted at hull penetrations remain both accessible and efficient in service.

Chapter 8 of MSN 1872 (F) Amendment 1 required fishing vessels to conduct monthly drills, including flooding drills. The MSN also advised that further guidance was contained in Marine Guidance Note (MGN) 570 (F) Amendment No.1[13].

1.5.2 Maritime and Coastguard Agency guidance to fishing vessel owners and crew

The MCA's MGN 570 (F) Amendment No.1 provided guidance to crew on methods for stopping water ingress and how to operate the vessel's bilge pumps.

The Fishermen's Safety Guide contained guidance on how to deal with a flood, warning that flooding was a major cause of accidents and could result from failed pipes, pumps and valves. Section 6 of the Fishermen's Safety Guide provided a flood action plan template that included generic examples of the following primary actions:

- *Sound alarm*
- *Check for water ingress*
- *Inform Coastguard via DSC*
- *Prepare to fight flooding*
- *Prepare LSA*[14]
- *Consider Abandon Ship.*

The guide recommended that vessel-specific requirements were identified through practical drills.

[13] MGN 570 (F) Amendment No.1 – Fishing Vessels: Emergency Drills.

[14] Lifesaving appliances.

Published in July 2001[15], MGN 165 (F) – Fishing Vessels: Risk of Flooding was produced in response to an MAIB finding that 18 of the 33 fishing vessel losses in 1999 were due to flooding. On reducing the flooding risk during vessel operations, the advice to crews included:

- *Always investigate* *immediately* *the cause of high bilge alarms.*
- *Regularly (at least weekly) test the bilge pumps and bilge system.*
- *Test bilge alarms daily.*
- *Regularly (at least monthly) open and close all bilge and sea water valves, to ensure they don't "seize".*
- *Keep sea water valves closed when not in use.*
- *Ensure crew members are familiar with sea water side valves and bilge systems. As a reminder, keep a plan at the engine room entrance, identifying the position of sea inlet valves.*
- *Check sea valves (including overboard non-return valves) whenever the vessel is slipped.*

1.5.3 Maritime and Coastguard Agency guidance to surveyors

The MCA's Marine Survey Instructions for the Guidance of Surveyors (MSIS) and surveyor advice note (SAN) guidance provided directions on the conduct of fishing vessel surveys. MSIS 23 – Survey & Certification provided general instructions for the survey of all vessel types and required surveyors to pay particular attention to hull plate thickness; watertight bulkheads; ship's side valves; bilge alarms; and pipework. Previously available to the public, MSIS 23 was intended for internal MCA reference only.

On construction and watertight and weathertight integrity, the publicly available MSIS 27 – Survey and Inspection of Fishing Vessels, instructed MCA surveyors to:

- Confirm, through non-destructive testing, that the vessel's hull plate wastage was no more than 25% of the original plate thickness[16].
- Ensure seawater valves were capable of closure from above the deck plate level[17].
- Conduct a thorough *check* of pipework, *with liberal use of hammer testing, including strainers and isolation valves, as failure has resulted in flooding. Any leakage found merits pressure test of the whole section, not just a localised repair… Sea water valves must be capable of closure from above the floorplates level*[18].

[15] MGN 165 (F) Amendment 1 was published in June 2025.

[16] MSIS 27 Chapter 2, section 2.7

[17] MSIS 27, Chapter 4, section 4.8

[18] MSIS 27 Chapter 4, section 4.8.7

- Confirm that the wear between the stern tube and the tail or propeller shaft did not exceed the manufacturer's allowable tolerances, or 2mm in the case of an oil lubricated shaft[19].

In October 2016, the MCA published SAN 29 – Surveying Marine Engine Cooling & Salt Water Piping Systems. SAN 29 provided information to surveyors on the different materials used in fishing vessel pipework as well as guidance on how to inspect each type and the challenges they posed; background information on engine cooling systems; types of corrosion; and materials used in piping applications. SAN 29 also detailed the MCA's requirement that:

- Fishing vessels over 10 years old undergo a *more invasive* survey regime and internal examination and pressure testing or thickness measurement at renewal surveys, unless it was proven that pipes had been renewed in the last 5 years.

- If a fishing vessel's pipework system was more than 10 years old, the vessel's owner should identify all ferrous[20] pipework and provide the surveyor with a pipework diagram for their vessel.

- A revised Report on Hull Condition should be provided that included a section reporting on the condition of seawater pipework, in addition to reports on the vessel's hull; tailshaft; rudder; propeller; sea valves; and draught marks.

On steel pipework, SAN 29 noted that:

> *Steel pipes are to be hot dip galvanised after fabrication. The rate of corrosion of zinc in seawater is somewhat less than that of steel, but galvanised coatings have a limited life and in almost all applications, a galvanised steel piping system would need to be replaced one or more times during the life of the installation, assumed to be 20 years.* [sic]

The target document for SAN 29 was MSIS 27. As of September 2025, SAN 29 had not been incorporated into MSIS 27 and remained an internal MCA reference document.

1.6 REFERENCE MATERIAL

In 2009, the RNLI produced a flooding video highlighting how the fishing community could prevent and respond to a vessel flood. The video included approximate rates of water ingress through the failure of various diameter pipes at different depths below a vessel's waterline. The RNLI video indicated that the failure of a pipe with a diameter of 7 inches (177.8mm) resulted in water ingress of about 8 tonnes (t) per minute, which equated to approximately 480t per hour.

1.7 INSPECTION OF A SIMILAR VESSEL

The investigation visited a former fishing vessel of similar age and built to the same design as *Opportune* to understand the vessel's general arrangement and view plans of the original seawater pipework.

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[19] MSIS 27, Chapter 4, section 4.5.5

[20] Containing or relating to iron.

Modifications carried out to the vessel's engine room had included replacing the main engine's seawater cooling system with a freshwater cooling system operated from a box cooler. This modified arrangement required less seawater pipework in the engine room and removed the need for the two sea inlet valves beneath the floor plates.

The vessel's engine room was fitted with an emergency fixed engine room suction pipe. This allowed an independently powered salvage pump and eductor[21] to be rigged on the upper deck to remotely pump out the engine room without the crew having to open the engine room doors or enter the space.

1.8 PREVIOUS SIMILAR ACCIDENTS

1.8.1 Context

In 2022, Seafish[22] reported that there were just under 4,080 active UK registered fishing vessels. Of these, just over 1,000 (25%) were over 10m in length. Further, the UK fishing vessel lists[23] indicated that approximately 75% of these registered and licensed fishing vessels were over 15 years old.

The MAIB received 230 reports of fishing vessel floods between 2013 and 2022, of which 78 (34%) resulted in the loss of the vessel. Of the vessels lost, 68 (87%) were over 15 years old. The data recorded the engine room as the most common location for fishing vessel floods.

1.8.2 *Audacious* and *Chloe T* – flooding and foundering

On 10 August 2012, *Audacious*, a Spanish built twin rig trawler of similar design to *Opportune*, flooded and foundered off Aberdeen, Scotland. On 1 September 2012, the beam trawler *Chloe T* flooded and foundered off Bolt Head, Devon. The combined investigations (MAIB report 27/2013[24]) found that the flooding in both vessels was probably due to failure of the seawater pipework. The investigations also found that neither crew could control the flood because they were unable to close the seawater inlet valves because the engine room floor plates under which the valves were sited quickly became submerged by floodwater. The investigation led to the MCA publishing SAN 29.

1.8.3 *Ocean Way* and *Ocean Quest* – flooding and foundering

On 3 March 2017, the trawler *Ocean Way* flooded and foundered off the Shetland Islands. The investigation (MAIB report 10/2018[25]) found that the port trawl door had probably struck and holed the hull, leading to a flood in the vessel's aft compartment. The flood could not be contained because the rate of floodwater ingress exceeded the capacity of the vessel's pumps.

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21 A non-mechanical pump used to move liquids such as seawater.

22 A non-departmental public body that supports the seafood industry in the UK.

23 https://www.gov.uk/government/collections/uk-vessel-lists

24 https://www.gov.uk/maib-reports/flooding-incidents-on-the-twin-rigged-stern-trawler-audacious-45-nautical-miles-east-of-aberdeen-scotland-and-beam-trawler-chloe-t-off-bolt-head-devon-england-resulting-in-both-vessels-sinking

25 https://www.gov.uk/maib-reports/flooding-and-sinking-of-stern-trawler-ocean-way

On 18 August 2019, the trawler *Ocean Quest* flooded and foundered off Fraserburgh. The investigation (MAIB report 3/2021[26]) could not determine the cause of the flood but concluded that it was almost certainly the result of shell plate or weld failure as the skipper engaged the main engine. The crew were unable to bring the flood under control, because they had not optimised the configuration of the vessel's pumps.

1.8.4 *Guiding Light* and *Guiding Star* – crew preparedness

On 6 October 2022, the pair trawlers *Guiding Light* and *Guiding Star* collided during a routine fish transfer. *Guiding Star*'s stern was breached and water flooded the aft compartment. The crew attempted to pump out the floodwater but were unsuccessful and *Guiding Star* foundered about an hour later.

The investigation (MAIB report 13/2024[27]) established that the crew were unaware of the potential consequences of a flood and had not been fully prepared for a flooding emergency. A recommendation was made to the MCA to ensure that the consequences of flooding on fishing vessels were highlighted appropriately and to update the guidance to surveyors to ensure that crew preparedness for a flooding emergency was checked and that the crew were aware of the actions to take. The investigation also resulted in the MCA publishing an updated version of MGN 165 (F), which was published in June 2025.

[26] https://www.gov.uk/maib-reports/flooding-and-sinking-of-trawler-ocean-quest

[27] https://www.gov.uk/maib-reports/collision-between-pair-trawlers-guiding-light-and-guiding-star-resulting-in-guiding-star-flooding-and-sinking

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

Opportune foundered after the vessel experienced a flood that the crew could neither limit nor manage. The crew abandoned ship into the vessel's liferafts and were later rescued uninjured by UK and Norwegian coastguard helicopters.

This section of the report will examine the circumstances of the accident, including the most likely source of flooding, the crew's ability to contain and control the flood, and the vessel's abandonment. This section will also examine the survey and inspection regime for seawater pipework.

2.3 THE ACCIDENT

The investigation did not inspect *Opportune* after the accident due to the depth of the wreck. Reports from the crew indicated that *Opportune* sank by the stern due to a rapid ingress of seawater into the vessel's engine room.

The floodwater had already reached the level of the gearbox when *Opportune*'s mate entered the engine room after the bilge alarm's activation. The exact location of the water ingress could not be seen but appeared to originate from below the engine room floor plates. The rate of flooding was difficult to estimate; however, the vessel's loss of propulsion and power approximately 15 minutes after the bilge alarm's activation was almost certainly due to the flood, indicating a rapid ingress of water to the engine room.

The mate and skipper were unable to re-enter the space to try and control the water ingress. This was because the entrance to the engine room was obscured by odourless white vapour, which was probably steam generated by the floodwater contacting the hot engine and its exhaust. Faced with a rapid and uncontrolled engine room flood, *Opportune*'s skipper raised the alarm and prepared the crew to abandon ship.

2.4 POTENTIAL SOURCE OF THE FLOOD

The definitive cause of the flood cannot be determined. However, the potential cause(s) included failure of the vessel's hull plate, stern seal, tailshaft, seawater valves or seawater pipework.

2.4.1 Hull plating

Opportune's hull plating was observed to be in good condition for the vessel's age at its last survey in 2022, and the latest hull thickness measurements were noted to be compliant, indicating that corrosion of the hull was unlikely to be excessive. Given that the vessel was not working its gear at the time of the accident there was no opportunity for its hull to be mechanically damaged by its trawl doors, which likely caused the flooding and loss of *Ocean Way* (see paragraph 1.8.3). *Opportune*'s main engine had been running uninterrupted for over 8 hours without issue, suggesting that a weld or plating failure, such as that potentially experienced by *Ocean Quest* (see paragraph 1.8.3) as it engaged its engine, was unlikely. Failure of the hull plating and associated welds is therefore considered an unlikely source of *Opportune*'s flood.

2.4.2 Stern seal and tailshaft

Although *Opportune*'s stern seal had overheated the evening before the accident, its temperature had consistently remained below 40°C following temporary repair by the crew. Given that the tailshaft was still turning when the mate went to the engine room to investigate the bilge alarm, it seems very unlikely that the tailshaft had failed. Additionally, even if *Opportune*'s tailshaft had later seized and then sheared, the vessel's rudder and nozzle **(**see **Figure 2)** would probably have prevented the propeller and tailshaft being lost. Further, the small tailshaft clearance within its bearing would have limited the rate of water ingress had the stern seal failed. The extreme flooding experienced make it unlikely that the stern seal or tailshaft were the source of *Opportune*'s flood.

2.4.3 Seawater valves

Opportune's seawater valves had been serviced in November 2022 and August 2023 as part of the vessel's survey cycle and post-grounding work, respectively. This recent servicing and inspection meant that it was very unlikely that inlet valve failure could have contributed to this accident.

2.4.4 Seawater pipework

Opportune's seawater pipework had suffered failures in the past. The pipework was made of galvanised mild steel, which meant that it was more vulnerable to corrosion than *aluminium bronze, cupro-nickel or similar corrosion resistant material* required by MSN 1872 (F) Amendment 1 for seawater pipework on new fishing vessels. The risk posed by seawater pipework on the similar vessel inspected during the investigation had been reduced by changing the engine cooling arrangement to a freshwater system. However, *Opportune*'s engine cooling system arrangement was original, and some parts of the seawater pipework could have been in place since the vessel's build in 1998. The MCA's SAN 29, advised surveyors that galvanised steel piping would need to be replaced one or more times during a 20-year lifespan. However, this guidance had not been incorporated into MSIS 27 and so was not publicly available. With sections of the vessel's seawater pipework measuring up to 200mm in diameter, even a partial failure of one of these larger pipes could result in a very rapid engine room flood.

Given the rate of water ingress, the vulnerability of the pipework to corrosion and the low likelihood of other sources, it is most likely that *Opportune*'s flood was caused by seawater pipework failure. Further, as SAN 29 was not publicly available, fishing vessel owners would have been unable to benefit from its detailed advice on pipework survey and maintenance.

2.5 SURVEY AND INSPECTION OF SEAWATER PIPEWORK IN FISHING VESSELS

The MCA renewal survey conducted 16 months before the accident did not record the condition of *Opportune*'s seawater pipework. When the vessel was out of the water for repairs following its grounding 7 months before the accident, *Opportune*'s owner had sensibly taken the opportunity to have the vessel's seawater pipework cleaned and inspected. However, with seawater pipework failure identified as the most likely cause of the flood, it is possible that neither the MCA survey nor the local contractor's inspection and cleaning had established the true condition of the vessel's seawater pipework or rectified areas at risk of failure.

Fishing vessel pipework can be difficult to inspect and maintain because a complex network of seawater, fuel and other pipes are often fitted into a confined space below a vessel's engine room floor plates. This limits the ability to visually assess and conduct non-destructive testing on all the pipework, resulting in less accessible or obscured sections of pipework being missed. This difficulty was evidenced when the local contractor was only able to remove some sections of the pipework for cleaning and inspection while other parts remained in situ.

The MCA's SAN 29 provided detailed information to surveyors on the different types of piping material and their various challenges. The SAN suggested that MCA surveys required owners of fishing vessels over 10 years old to ensure any vessel pipework that had not been replaced in the last 5 years was pressure tested or had undergone a thickness check. Additionally, SAN 29 advised surveyors that owners should present them with a pipework diagram for their vessel that identified all sections of ferrous pipework; noting that galvanised steel pipework was expected to be replaced at least once over a vessel life of 20 years. However, there is no record that the MCA requested this assurance from *Opportune*'s owners or required the production of a pipework diagram as part of the vessel's survey process. The investigation also found no indication or record of any pipework testing before the renewal survey.

This omission might have been because SAN 29 had not been incorporated into the target document MSIS 27 and the Report on Hull Condition did not therefore include comment on *Opportune*'s seawater pipework. Without the prompt of the Report on Hull Condition and with SAN 29 outside of the MCA's published instructions to surveyors, it is possible that not all MCA surveyors were aware of the guidance and the particular need to understand the condition of ferrous pipework.

The lack of assurance for the condition of fishing vessel pipework, particularly in older vessels, is concerning given that the majority of the UK fishing fleet is over 15 years old. Without clear guidance or advice to surveyors and owners, or records of when pipework sections had been replaced, and with comprehensive inspection and cleaning of *Opportune*'s pipework proving challenging, it is likely that deficiencies in the vessel's difficult to access areas might have been missed.

2.6 RISK ASSESSMENT AND DRILLS

Opportune's safety folder contained a risk assessment for sea inlet valve failure; however, there was no risk assessment for failure of seawater pipework, no flood drill scenario as described in MGN 570 (F) Amendment No. 1, and no flood action plan as recommended by the Fishermen's Safety Guide. Additionally, the vessel's safety folder did not reflect the guidance in MGN 165 (F) to have a plan showing the location of the inlet valves positioned close to the engine room or for the routine testing of bilge pumps, bilge alarms or the operation of sea inlet valves.

Flooding remains a consistent cause of fishing vessel loss, particularly in older vessels, with hull, tailshaft, sea inlet valve and pipework failure all common causes of water ingress. When these systems fail, they present an immediate risk to both the vessel and its crew and, as the Fishermen's Safety Guide advised, once discovered, floods need to be quickly fought to bring the situation under control.

Without a risk assessment for pipework failure or any action plan to follow in the event of a flood, the crew's preparation for dealing with pipework failure and a flooding emergency on *Opportune* was limited. Flooding scenarios were not included in the monthly drills, which might also have affected the crew's preparedness to deal with the situation.

2.7 ABILITY TO CONTAIN THE FLOOD

2.7.1 Sea inlet valves

The most likely cause of *Opportune*'s flood was a failure of the seawater pipework, some of which was up to 200mm in diameter. The RNLI guidance estimated that the potential rate of water ingress from such a failure was about 480t per hour, which far exceeded the combined 50m^3 per hour capacity of *Opportune*'s two electrically operated bilge pumps. This meant that shutting the sea inlet valves was the crew's only option to try to contain a flood from pipework failure. However, *Opportune*'s two sea inlet valves were located below the engine room's floor plates. The crew could only access these valves by lifting a small, hinged flap in the floor plate and then using an extension handle, stored nearby, to close the valves and isolate the pipework. This arrangement, not uncommon in older fishing vessels, meant that closing the seawater inlet valves was almost impossible once the engine room floor plates were submerged, as they were when *Opportune*'s flood was discovered.

The seawater pipework requirements outlined in MSN 1872 (F) Amendment 1 differed for new and existing vessels. Owners of existing vessels, such as *Opportune*, were required to provide *rapid and practical means* for the operation of these valves, which in practice meant the provision of detachable extension spindles. In new vessels, the inlet valves below the floor plate had to have permanent arrangements that allowed the valves to be *readily accessible above the floor plates*. This requirement could be met using either permanently fitted extended spindles or other types of valves, some of which could be operated remotely from outside the engine room.

Opportune's crew did not have the opportunity to attempt to stem the engine room flood because the seawater inlet valves could not be closed before they became inaccessible. This was similar to the conditions described in the *Audacious* and *Chloe T* incidents (paragraph 1.8.2), where neither crew was able to operate their vessel's submerged sea inlet valves. Without permanent extension handles or valves that could be operated remotely from outside the engine room, *Opportune*'s crew could not attempt to contain flooding from a seawater pipework failure.

2.7.2 Bilge pumps

Opportune's main bilge pumping capability was provided by the two electrically driven bilge pumps located and operated from within the engine room. Additionally, the vessel had a small hand pump and portable salvage pump. The total pumping capacity was around $66m^3$ per hour.

Even if *Opportune*'s crew had been able to start the vessel's electric pumps, given the rate of water ingress and the fact that water continued to enter the vessel it is doubtful that a meaningful reduction of water could have been achieved before electrical power was lost. However, without the facility to remotely start the pumps, *Opportune*'s bilges could not be drained once access to the engine room became unsafe.

2.8 ABANDONMENT

As soon as it became apparent that it was unsafe to re-enter the engine room *Opportune*'s skipper made the decision to raise the alarm and abandon ship. The use of the VHF DSC alarm was effective and quickly provided HMCG with the vessel's position and the nature of the emergency before voice communications were lost. Thereafter, the crew responded swiftly and launched and boarded the liferafts without entering the water or sustaining any injuries. The skipper's activation of the EPIRB was also critical in enabling the SAR helicopters to swiftly locate the liferafts and survivors.

The timely decision by *Opportune*'s skipper to raise the alarm and abandon ship, combined with the crew's familiarity with their drill and lifesaving appliances, contributed to their successful rescue.

SECTION 3 – CONCLUSIONS

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

1. *Opportune* foundered because of a rapid and uncontrolled engine room flood. [2.3]

2. The rate of water ingress, the vulnerability of seawater piping to corrosion and the lower likelihood of other sources of water ingress meant that the most likely cause of the engine room flood was a failure within *Opportune*'s seawater pipework. [2.4]

3. *Opportune*'s seawater pipework was difficult to inspect and maintain and the MCA's survey framework lacked specific detail on assurance of seawater pipework condition. This meant that there was no comprehensive assessment of the pipework condition and corrosion might have gone unnoticed in difficult to access areas. [2.5]

4. The skipper's timely decision to raise the alarm and abandon ship, combined with the crew's familiarity with their drills and lifesaving appliances, contributed to the crew being safely rescued uninjured. [2.8]

3.2 OTHER SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT

1. *Opportune*'s seawater inlet valves were not easily accessible and could not be operated remotely from outside the engine room. This limited the crew's opportunity to contain a seawater pipework flood by closing the valves before they became submerged. [2.7.1]

2. *Opportune*'s bilge pumps could not be operated from outside the engine room. This meant that the crew had no opportunity to use the electric bilge pumps once the engine room became inaccessible. [2.7.2]

3.3 SAFETY ISSUES NOT DIRECTLY CONTRIBUTING TO THE ACCIDENT THAT HAVE BEEN ADDRESSED OR RESULTED IN RECOMMENDATIONS

1. The MCA's SAN 29 had not been incorporated into formal survey procedures or in the published guidance to surveyors, which meant that some MCA surveyors could have been unaware of the SAN. Additionally, SAN 29 was not available to fishing vessel owners so they could not benefit from its detailed advice and guidance. [2.5]

2. *Opportune*'s risk assessments, plans, drills and procedures lacked detail on the seawater system, flood prevention and response to floods. This meant the crew were not prepared for the unfolding flooding emergency, putting them at risk. [2.6]

SECTION 4 – ACTION TAKEN

4.1 MAIB ACTIONS

The **MAIB** has issued a safety flyer to the fishing industry **(Annex A)**.

SECTION 5 – RECOMMENDATIONS

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

2026/107 Amend Marine Survey Instructions for the Guidance of Surveyors 27 – Survey and Inspection of Fishing Vessels to incorporate surveyor advice note 29.

2026/108 In line with surveyor advice note 29:

- Require owners of fishing vessels that are more than 10 years old to identify ferrous pipework and provide a seawater pipework diagram for their vessel that shows the age of each section of pipework.

- Revise the *Report of Hull Condition of a Fishing Vessel* to include a report on the condition of the vessel's seawater pipework.

2026/109 At the next revision of the Fishermen's Safety Guide, align the document with the flood mitigation guidance contained in Marine Guidance Note 165 (F) – Fishing Vessels: Risk of Flooding. In particular, that engine room diagrams showing the location of the sea inlet valves should be displayed outside entrances to these compartments and a record of when each section of pipework was last replaced.

Quiet Waters Fishing Company Limited is recommended to:

2026/110 Review its fishing vessel safety management system to:

- include a flooding drill for its vessel(s)

- include a risk assessment for the failure of the seawater pipework

- implement the guidance detailed in Marine Guidance Note 165 (F) – Fishing Vessels: Risk of Flooding for its vessel(s).

2026/111 Produce a seawater pipework diagram for its vessel(s) that includes identification of ferrous pipework and a record of when each section of pipework was last replaced.

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

MAIB safety flyer to the fishing industry

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY FLYER TO THE FISHING INDUSTRY

Flooding and foundering of the stern trawler *Opportune* (LK 209) approximately 36 nautical miles east of Lerwick, Shetland Islands, Scotland on 24 March 2024

Image courtesy of Calum Gray (MarineTraffic)

Opportune

Narrative

At 0530 on 24 March 2024, the UK registered stern trawler *Opportune* sank 36 nautical miles east of Lerwick, Shetland Islands. Scotland. The loss resulted from a flood in the engine room that could not be brought under control. Once the situation became untenable the eight crew abandoned the vessel, and it foundered shortly afterwards. The crew were all rescued unharmed.

The investigation could not identify with certainty the source of the flood, but the most likely cause was failure of the vessel's seawater pipework, some of which might have been in place since the vessel was built in 1998. The flood could not be contained because the crew were unable to enter the engine room and start its bilge pumps, nor were they able to close the sea inlet valves. Faced with a rapidly sinking vessel, *Opportune*'s skipper raised the alarm and the crew abandoned ship to the liferafts in good time. UK and Norwegian coastguard helicopters later rescued the uninjured crew.

Safety lessons

1. Raise the alarm immediately if your vessel suffers a flood. *Opportune*'s skipper swiftly made a "Mayday" call on very high frequency (VHF) radio and operated the digital selective calling (DSC) distress alert to inform the authorities and other ships that the vessel was sinking. The skipper also activated *Opportune*'s emergency position indicating radio beacon (EPIRB). This meant that the authorities were quickly aware of the vessel's distress and its location despite *Opportune* losing power a few minutes later. It also ensured that the coastguard, who did not hear all of the skipper's voice call, were able to dispatch a lifeboat and helicopters to quickly locate and rescue the crew.

2. Every fishing vessel should have a pre-planned and well-drilled response to a flood. This should involve everybody on board knowing how to start the bilge pumps and, if necessary, close the engine room sea inlet valves. *Opportune*'s sea inlet valves, as with many older vessels, were located below the engine room floor plates and had to be operated using portable extension handles. It is therefore important to ensure that these valves are clearly marked and that diagrams showing their location are displayed close to the engine room entrance. *Opportune*'s bilge pumps could only be started from inside the engine room. The ability to operate pumps remotely means they can still be used even if access to the engine room is lost.

3. Ensure the vessel's seawater pipework is in good condition. *Opportune* was 26 years old and it is likely that some of its mild steel pipework had been in place since the vessel was built. Fishing vessel owners need to have a maintenance plan for their vessel's seawater pipework to ensure that it is routinely inspected and, if necessary, tested. The saltwater environment is very corrosive, and hot dipped galvanised pipework has a limited life, so replacement should be expected over a 20-year vessel operational life.

4. On average, over seven fishing vessels are lost every year due to flooding. Marine Guidance Note 165 (F) – Fishing Vessels: Risk of Flooding advises, among other things, to swiftly investigate bilge alarms; ensure all watertight and weathertight doors are closed when not in use; test your bilge pumps and strainers weekly; open and close the sea inlet valves every month; quickly repair leaking pipes; and test your salvage pumps weekly.

This flyer and the MAIB's investigation report are posted on our website: www.gov.uk/maib

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Extract from The United Kingdom Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 – Regulation 5:

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

NOTE

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

Marine Accident Report

INVESTORS IN PEOPLE