ACCIDENT REPORT

Report on the investigation of

a fall from a pilot ladder, resulting in the death of a pilot while boarding the cargo vessel

Finnhawk from pilot vessel ***Humber Saturn***

in the approaches to the Humber Estuary, England

on 8 January 2023

VERY SERIOUS MARINE CASUALTY REPORT NO 2/2026 JANUARY 2026

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

The United Kingdom Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2012 – Regulation 5:

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

NOTE

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

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

°C	-	degrees Celsius
ABP	-	Associated British Ports
ABP Humber	-	Associated British Ports Humber Estuary Services
AD	-	Approved Doctor, appointed by the Maritime and Coastguard Agency to conduct seafarer's medical examinations
ADG	-	Approved Doctor's Guidance, published in the Approved Doctor's Manual – Seafarer Medical Examinations – July 2020 edition
ALB	-	all-weather lifeboat
BMI	-	body mass index
CHA	-	Competent Harbour Authority
cm	-	centimetre
COSWP	-	Code of Safe Working Practices for Merchant Seafarers
CPR	-	cardiopulmonary resuscitation
ENG1	-	the standard medical fitness certificate for UK seafarers on seagoing vessels
ENG2	-	a medical examination of seafarers report generated by an Approved Doctor
FFPM	-	Fédération Française des Pilotes Maritimes
GTGP	-	A Guide to Good Practice on Port Marine Operations
HMCG	-	His Majesty's Coastguard
HSE	-	Health and Safety Executive
IMO	-	International Maritime Organization
kg	-	kilogram
kts	-	knots
m	-	metre
MCA	-	Maritime and Coastguard Agency
MCC	-	Marine Control Centre
MGN	-	Marine Guidance Note
ML5	-	a domestic medical fitness certificate for seafarers
MOB	-	man overboard
MSFV LOLER	-	Statutory Instrument 2008 No.2166 – The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) (Amendment) Regulations 2008

MSN	-	Merchant Shipping Notice
OHP	-	occupational health provider
PIW	-	person-in-water
PLB	-	personal locator beacon
PMSC	-	Port Marine Safety Code (renamed the Ports and Marine Facilities Safety Code in April 2025)
PPE	-	personal protective equipment
RA	-	risk assessment
RIB	-	Rigid inflatable boat
RNLI	-	Royal National Lifeboat Institution
RUK	-	RenewableUK
SHA	-	Statutory Harbour Authority
SOLAS	-	International Convention for the Safety of Life at Sea, 1974, as amended
SWL	-	safe working load
t	-	tonnes
TfNSW	-	Transport for New South Wales
VTS	-	vessel traffic services

TIMES: all times used in this report are universal time coordinated (UTC) unless otherwise stated.

Image courtesy of Michael Ludlow (MarineTraffic.com)

Finnhawk/Humber Saturn

SYNOPSIS

At about 1300 on 8 January 2023, a Humber pilot fell without warning from the pilot ladder while boarding the roll-on/roll-off cargo vessel *Finnhawk* in the approaches to the Humber Estuary, England. The pilot landed on the deckhouse and safety rail of the pilot vessel *Humber Saturn*, sustaining back injuries before falling overboard. He could not be recovered from the water as the pilot vessel's man overboard recovery platform could not be raised. The pilot was recovered to a lifeboat over 40 minutes later from the partially submerged recovery platform. He was then evacuated to hospital by a coastguard helicopter and later pronounced dead.

The investigation found that it was probable that the pilot suffered a cardiac event that caused him to let go of the ladder and fall. Thereafter, the pilot's prolonged semi-immersion in cold seawater due to a fault with the pilot vessel's recovery platform significantly reduced his chance of survival. Further, the seafarer's medical certificate issued to the pilot 6 months before the accident should not have declared him fully fit for duty given that he suffered from several chronic health conditions that may have affected his fitness to perform his role.

The investigation also found that the port authority had not health assessed the physical capabilities required of its pilots to establish an occupational standard for the role. Additionally, despite the pilot's colleagues raising concerns about his fitness and attempting to dissuade him from working that day, the port's safety procedures were ineffective in preventing him boarding the cargo vessel.

Since the accident the port has: introduced an improved medical standard for its pilots; upgraded its pilot vessels' ability to recover an unconscious person from the water; reviewed the emergency care capability of its pilot vessels; and, improved its Stop-Work Authority programmes within the port.

A recommendation has been made to the Maritime and Coastguard Agency to provide guidance for non-SOLAS vessels to carry an alternative means of recovering an unconscious person from the water that does not rely on the use of shipboard systems.

Associated British Ports has been recommended to risk assess and, where necessary, update its pilots' personal protective equipment to improve their survivability in cold water and to identify and act upon safety critical defects to their pilot vessels.

Since the accident UK port industry bodies have updated the Embarkation and Disembarkation of Pilots Code of Safe Practice to provide advice on the positioning of the pilot boat during embarkation and disembarkation. These industry bodies have also been recommended to further update this Code to provide guidance to harbour authorities on the development of occupational health standards and the provision of suitable personal protective equipment for marine pilots.

SECTION 1 – FACTUAL INFORMATION

1.1 PARTICULARS OF *FINNHAWK*, *HUMBER SATURN* AND ACCIDENT

SHIP PARTICULARS		
Vessel's name	*Finnhawk*	*Humber Saturn*
Flag	Finland	UK
Classification society/ Certifying Authority	RINA S.p.A	Maritime and Coastguard Agency
IMO/MMSI number	9207895	235032574
Type	Roll-on/roll-off cargo ship	Pilot vessel
Registered owner	Finnlines Plc	Associated British Ports Humber Estuary Services
Manager(s)	Finnlines Plc	Associated British Ports Humber Estuary Services
Construction	Steel	Glass reinforced plastic
Year of build	2001	2006
Length overall	162.582m	15.28m
Registered length	153.6m	Not applicable
Gross tonnage	11671	Not applicable
Minimum safe manning	11	2
Authorised cargo	Freight vehicles	Pilots

VOYAGE PARTICULARS		
Port of departure	Helsinki, Finland	Grimsby, England
Port of arrival	Hull, England	Grimsby, England
Type of voyage	International	Internal
Cargo information	Freight vehicles	Pilots
Manning	15	2

MARINE CASUALTY INFORMATION		
Date and time	8 January 2023 at 1300	
Type of marine casualty or incident	Very Serious Marine Casualty	
Location of incident	West of No.3 Chequer Buoy at the entrance to the Humber Estuary	
Place on board	Starboard pilot ladder	Not applicable
Injuries/fatalities	Pilot fatality	
Damage/environmental impact	None	Minor damage to port forward handrail
Ship operation	Embarking/disembarking people	Embarking/disembarking people
Voyage segment	Arrival	Mid-water
External & internal environment	Air temperature 8°C; wind direction westerly; wind speed 19kts; wave height 1m to 1.5m from the south/ south-east; sea temperature 7°C	
Persons on board	15	3 pilots, 2 crew

1.2 NARRATIVE

1.2.1 Pilotage preparations and passage to *Finnhawk*

At 1030 on 8 January 2023, Francesco Galia, a Humber Class-2 pilot (the pilot) was contacted at home by the vessel traffic services (VTS) located at the Humber Marine Control Centre (MCC) and given 2.5 hours' notice that his next pilotage act would be the inbound roll-on/roll-off (ro-ro) cargo vessel *Finnhawk* **(Figure 1)**. He was also informed that a Class-3 pilot under training (the trainee pilot) would attend the vessel with him.

About 40 minutes later, the pilot and the trainee pilot met at the Associated British Ports (ABP) Humber's office in Hesslewood, Hull, England to prepare the passage plan for *Finnhawk*'s arrival. On completion of the passage plan the pilot and the trainee pilot travelled to the MCC at Grimsby[1]. During the car journey the trainee pilot mentioned they had seen the pilot walking slowly. The pilot responded that he had lower back pain and sciatica[2], had not rested well and was taking painkillers.

At the MCC the pilot and the trainee pilot met another Class-1 pilot (the tanker pilot) who was to board the same pilot vessel, *Humber Saturn* **(Figure 1)**, for transfer to an inbound tanker. The plan was that the tanker pilot would be the first to transfer from *Humber Saturn*, after which the pilot vessel would take the pilot and trainee pilot to *Finnhawk*.

While at the MCC, the trainee pilot mentioned to the tanker pilot that the pilot was unwell. During this discussion, the trainee pilot made two suggestions: either the tanker pilot and the pilot swapped jobs, as the tanker's shorter pilot ladder meant that embarkation would be less demanding for the pilot than the longer climb onto *Finnhawk*; or that, being suitably qualified, the trainee pilot board the tanker and the tanker pilot board *Finnhawk* so that the pilot could remain ashore. While the tanker pilot was content with either proposal, the pilot firmly rejected both options.

The trainee pilot also informed the MCC staff that the pilot had back pain. The MCC staff then informed the VTS staff, who watched on closed-circuit television the three pilots walk along the jetty towards the pilot vessel.

At 1238, the coxswain on board *Humber Saturn* was contacted by the VTS staff who had been concerned by the pilot's slow, laboured walk to the pilot vessel. At the request of the VTS staff, the pilot vessel coxswain asked the pilot if he wanted to proceed with the transfer, to which the pilot emphatically responded that he did. *Humber Saturn* then got underway.

About 10 minutes later, following discussions between the pilots, *Humber Saturn*'s boarding plan was changed so that the pilot transfer to *Finnhawk* would take place first. This would allow the tanker pilot to board the cargo vessel if the pilot was unable to do so. The VTS staff acknowledged the proposed change to the boarding plan and reiterated the option for the trainee and tanker pilot to swap jobs to allow the pilot to return to Grimsby if he felt he could not board *Finnhawk*.

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[1] A journey of approximately 45 minutes.

[2] Irritation or compression of the sciatic nerve, usually affecting your bottom and the back of one leg, often including your foot and toes. You may feel a sharp, burning pain down the back of the leg; tingling like pins and needles; numbness; and weakness (https://www.nhs.uk/conditions/sciatica).

Image courtesy of Nicola Jepsen (MarineTraffic.com)

Image courtesy of Michael Thomas (MarineTraffic.com)

Figure 1: *Finnhawk* and *Humber Saturn*

1.2.2 The accident

At about 1257, at the agreed boarding position just west of No.3 Chequer Buoy **(Figure 2)**, *Humber Saturn* rounded the stern of *Finnhawk*, matched its speed of about 6 knots (kts), and came into the lee along its starboard side adjacent to the rigged pilot boarding ladder. The ladder had been lowered to 1m above the waterline and the climb to *Finnhawk*'s upper deck was about 6.5m **(Figure 3)**.

Finnhawk's second officer and an able seaman were monitoring the embarkation at the top of the pilot ladder. The wind was from the west at about 19kts, and there were 1m to 1.5m waves from the south/south-east. The sea temperature was 7°C[3].

Before *Humber Saturn*'s deckhand left the cabin with the pilot and the trainee pilot, the coxswain again asked the pilot if he really wanted to climb the ladder, to which the pilot firmly replied that he did. The deckhand, pilot and trainee pilot then left the pilot vessel's cabin and clipped their harnesses to *Humber Saturn*'s safety rail[4]. They walked along the outboard side of the pilot vessel and passed in front of the wheelhouse to position themselves at the pilot boarding area. *Humber Saturn*'s port bow was pressed against *Finnhawk*'s hull, creating an angle between the two vessels **(**see **Figure 2)**. The pilot was wearing his rucksack on his back.

Humber Saturn's deckhand checked *Finnhawk*'s pilot boarding ladder, which appeared in good condition and then put their weight on it. Before climbing the ladder, the pilot visually inspected it and then put his weight on it and pulled it away from the cargo vessel's hull to check that it was secure. The pilot then asked the trainee pilot if they would like to go first. The trainee pilot declined.

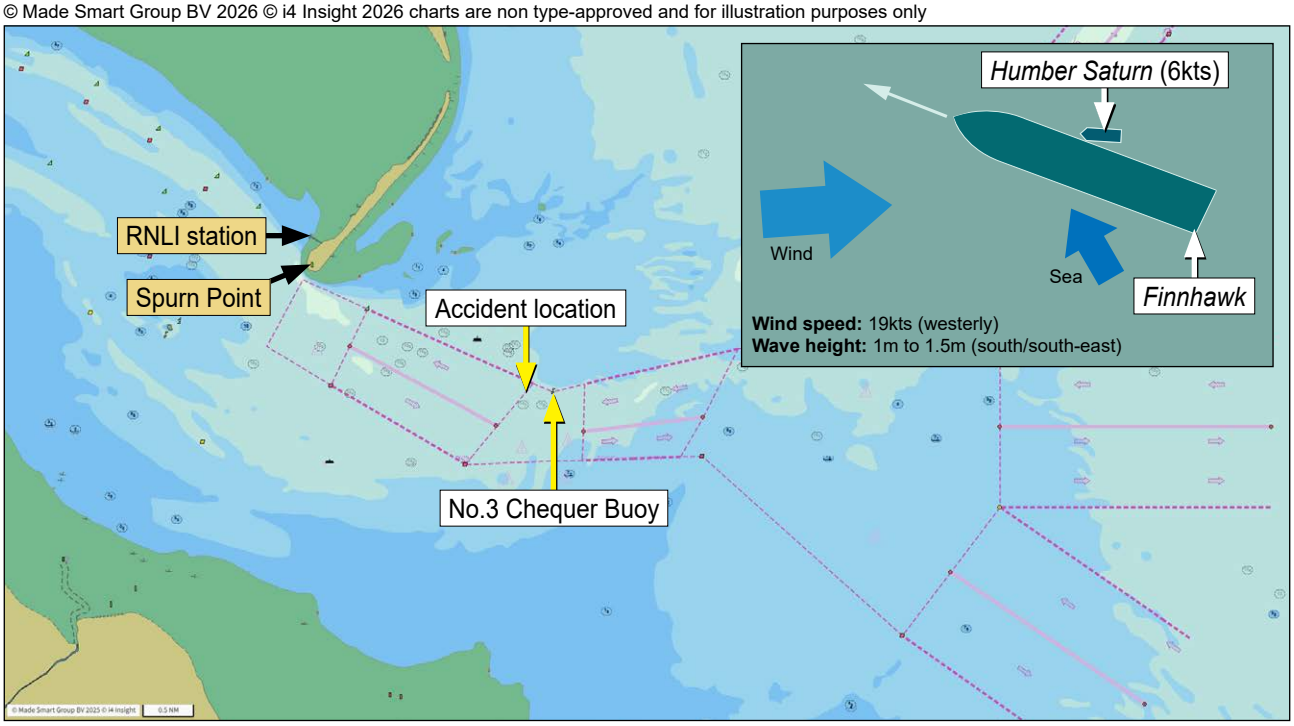

Figure 2: The accident location

[3] UK Meteorological Office hindcast.

[4] Also known as the Hadrian's rail.

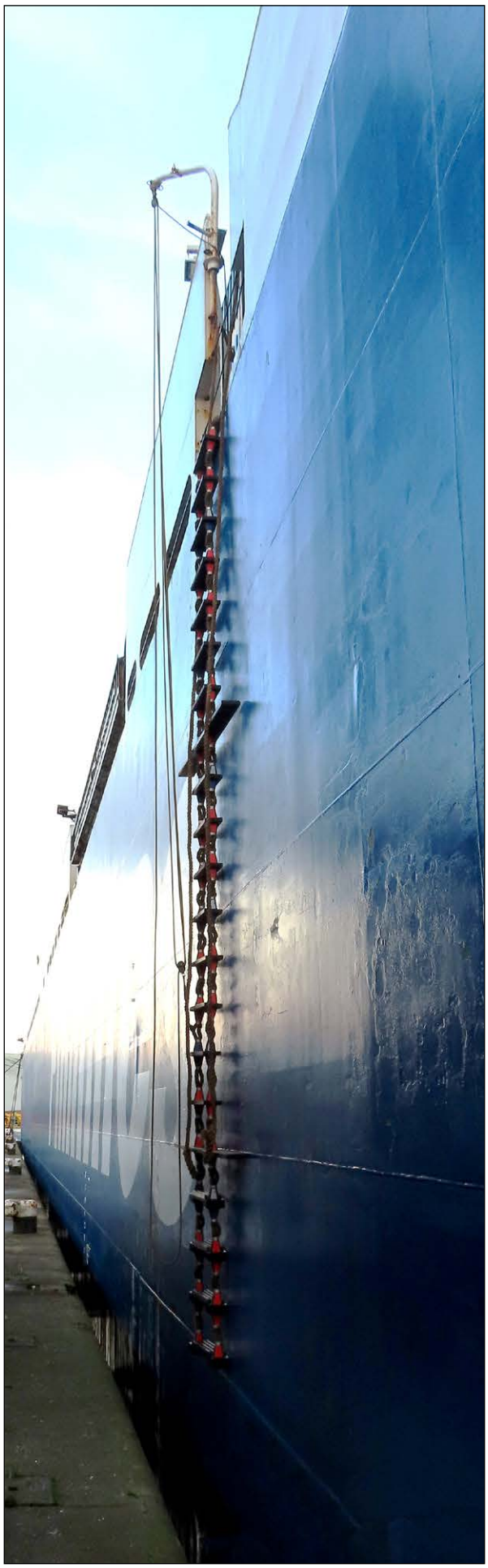

Figure 3: *Finnhawk*'s pilot ladder

At about 1300, the pilot unclipped his harness from *Humber Saturn*'s safety rail, stepped onto the pilot boarding ladder and began his climb. The pilot's upper body was further away from the ladder than his lower limbs and his progress was very slow. When the pilot was 2m to 2.5m above the pilot vessel's deck he stopped and looked up at *Finnhawk*'s two crew members on the deck above, before suddenly leaning further back and letting go of the ladder, releasing both hands simultaneously. The pilot then fell backwards without making a sound and landed on his back on the port side of *Humber Saturn*'s deck house and safety rail, just in front of the wheelhouse windows **(Figure 4a)**. The shell of the pilot's safety helmet broke and came off when he struck the pilot vessel. *Humber Saturn*'s deckhand saw the pilot land on the pilot vessel and attempted unsuccessfully to grab him. The pilot then slipped from the pilot vessel's deck and fell into the gap between the two vessels.

The pilot's lifejacket, which was integrated into his waterproof coat, inflated as he entered the water and his personal locator beacon (PLB) activated. The pilot floated in the upright position with his head above water. *Humber Saturn*'s deckhand shouted "Man overboard!" and the pilot vessel's coxswain asked the tanker pilot to contact VTS Humber on very high frequency (VHF) radio while they focused on recovering the pilot.

1.2.3 The recovery

With the trainee pilot pointing to the pilot's location, and *Humber Saturn*'s deckhand readying the MateSaver man overboard (MOB) rescue pole, the coxswain swiftly turned the pilot vessel to starboard. As the pilot floated astern of *Finnhawk*, the coxswain manoeuvred the vessel to bring the pilot alongside *Humber Saturn*'s port side.

Approximately two minutes after the pilot's fall, the deckhand used the MateSaver MOB rescue pole to catch hold of the pilot and manoeuvre him to the stern of the pilot vessel **(Figure 4b)**, while the tanker pilot prepared the pilot vessel's defibrillator. After entering the water, the pilot had initially displayed some arm movement and a level of consciousness while appearing to try to keep himself away from the hull of *Finnhawk*, and the pilot vessel's crew thought he might have suffered a head injury. Shortly after the crew had secured the pilot in the MateSaver MOB rescue pole's sling, he vomited and appeared to lose consciousness.

In line with ABP's person-in-water (PIW) procedures, *Humber Saturn*'s coxswain stopped both engines, leaving the ignition on, and asked the tanker pilot and trainee pilot to deploy the pilot vessel's PIW recovery platform. The two pilots were unable to lower the platform more than halfway using the mobile control box. Seeing this, the coxswain entered the pilot vessel's aft void space and manually operated the hydraulic system solenoid valve to lower the platform.

The coxswain, trainee pilot and deckhand then manoeuvred the pilot onto *Humber Saturn*'s lowered recovery platform. Despite using the mobile control box, the solenoid valve and the secondary manual hand pump in the void space the crew's attempts to raise the recovery platform from its lowered position were unsuccessful **(Figure 4c)**.

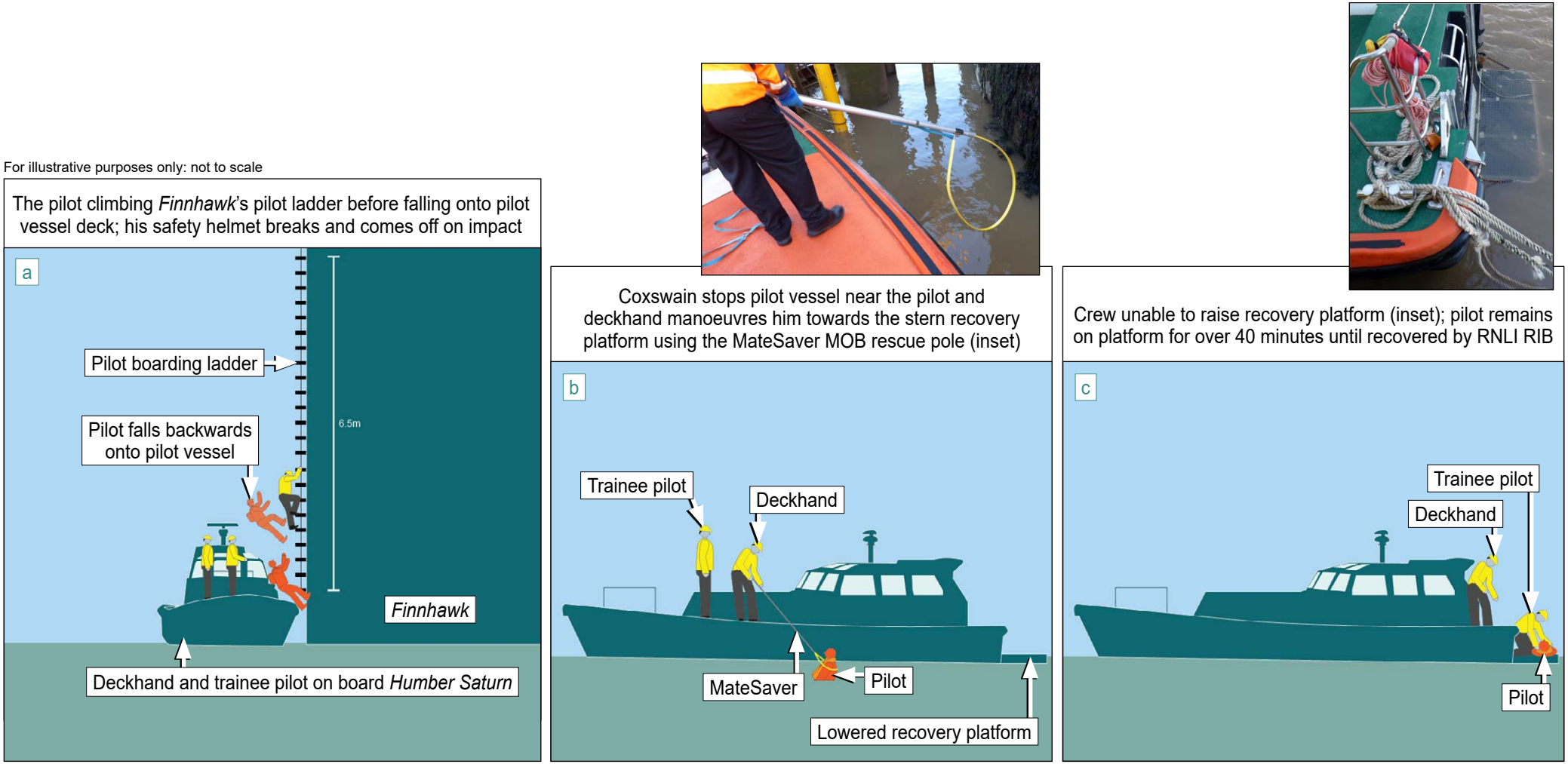

Figure 4: The pilot's fall and recovery to the pilot vessel

Within minutes of *Humber Saturn*'s crew reporting the "Man overboard!" on VHF channel 14 at 1300, VTS Humber had tasked other pilot vessels to assist[5] and at 1303 informed His Majesty's Coastguard (HMCG) of the situation. During ongoing communications between the pilot vessel and VTS, the trainee pilot informed VTS Humber that the pilot's condition was serious.

Humber Saturn's coxswain had to keep the pilot vessel moving ahead at slow speed as sea conditions were causing water to wash over the pilot on the lowered recovery platform. Seeing this, the trainee pilot jumped down onto the partially submerged recovery platform, lifted the pilot's head clear of the cold water and talked to him. The trainee pilot was occasionally chest-deep in water while supporting the pilot and was unable to determine whether the pilot was still breathing.

At 1307, HMCG requested the Royal National Lifeboat Institution (RNLI) allweather lifeboat (ALB) to launch from Spurn Point. The ALB arrived on scene at 1326, followed two minutes later by HMCG search and rescue helicopter *Rescue 912*. Unable to safely come alongside the pilot vessel due to the sea conditions, the ALB's crew launched their rigid inflatable boat (RIB) to transfer the pilot to the ALB for winch transfer to the helicopter. At about 1340, the lifeboat crew manoeuvred the RIB alongside *Humber Saturn*'s recovery platform and transferred the pilot onto the RIB with the trainee pilot's help. The RIB returned to the ALB and the pilot was transferred onto the lifeboat, where the crew started cardiopulmonary resuscitation (CPR).

By about 1355, the pilot had been winched from the ALB by *Rescue 912*. Once on board the helicopter the attending aircrew were unable to detect the pilot's pulse and he was not breathing so they commenced CPR during the transfer to Hull Royal Infirmary.

On arrival at Hull Royal Infirmary, the pilot was handed over to medical staff at 1420. Sadly, despite further attempts at resuscitation, the pilot was pronounced deceased at 1452. The trainee pilot was later treated for hypothermia and *Humber Saturn*'s deckhand was treated for a hand injury sustained during the rescue.

1.3 POSTMORTEM EXAMINATION

A Home Office pathologist conducted a postmortem on the deceased pilot, Francesco Galia. The interim death certificate recorded his cause of death as *hypertensive and ischaemic heart disease*[6] *and the effects of immersion in water (pending further investigations)*.

The pilot's postmortem report also noted that:

- The pilot's medical history included: hypercholesterolaemia (high cholesterol), ischaemic heart disease and hypertension (2011); an acute anterior myocardial infarction (2011); atrial fibrillation (2018); heart failure, stroke (2018); chronic kidney disease and lower back pain (2022).

[5] Pilot vessel *Ouse* was dispatched by VTS Humber from Grimsby. Pilot vessel *Venus* also offered assistance but was later informed by *Humber Saturn*'s crew that it was not required.

[6] Also known as coronary heart disease, ischaemic heart disease occurs when the heart's blood supply is blocked or reduced, often due to a build-up of fatty substances in the coronary arteries. Hypertension (high blood pressure) is a risk factor. Ischaemic heart disease can lead to chest pain (angina) or a heart attack.

- The pilot's body mass index (BMI) indicated that he was obese[7].

- While the pilot's head was uninjured, his thoracic spine had been fractured. This indicated that the pilot's torso had probably absorbed much of the force when he landed on the pilot vessel[8].

- The pilot's *lung histology also included areas of alveolar over distension …which is consistent with the effects of drowning*.

- There was *compelling pathological evidence that* the pilot *was at risk of a sudden cardiac event occurring at any time, and without warning*.

- Although a scenario where the pilot accidentally lost his footing or grip on the pilot ladder could not be discounted, *in purely pathological terms it is entirely possible that* [the pilot] *suffered a sudden cardiac arrhythmia which caused him to let go and enter the water*.

- *In some cases, immersion in cold water can provoke a sudden cardiac event, especially if an individual has pre-existing heart disease. It also seems reasonable to suggest that intense physical activity such as* [the pilot] *'struggling' in the water may have triggered a cardiac event, causing him to lose consciousness and subsequently drown*.

1.4 *FINNHAWK*

Finnhawk was a Finland registered ro-ro cargo vessel that operated between Helsinki, Finland and Hull, England. The vessel's pilot ladder was inspected post-accident and found to be of an approved design, in good condition and correctly secured to the vessel. The pilot ladder's retrieval line had been rigged leading aft and attached just below the last spreader.

1.5 ASSOCIATED BRITISH PORTS HUMBER ESTUARY SERVICES

1.5.1 Overview

ABP Humber Estuary Services (ABP Humber) was the Statutory Harbour Authority (SHA) and Competent Harbour Authority (CHA) for the Humber Estuary and its approaches where the accident took place. ABP Humber's role as the SHA meant the company was legally responsible for the management of marine operations within the port area. As CHA, and in line with the Pilotage Act 1987, ABP Humber was responsible for the authorisation of suitably qualified marine pilots for operations in its waters.

ABP Humber was required to oversee the safe operation of the port in line with the UK Port Marine Safety Code[9] (PMSC) and supporting publication *A Guide to Good Practice on Port Marine Operations* (GTGP). The PMSC set out to enhance safety for those using or working in ports, their ships and passengers, and the maritime environment.

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[7] The pilot's BMI was 36.1kg/m^2. A BMI of 30kg/m^2 is considered obese.

[8] The report also stated that the pilot had suffered several anterior rib fractures, these injuries were not attributed to the fall.

[9] The Code was renamed the Ports and Marine Facilities Safety Code in April 2025.

1.5.2 Pilot operations

ABP Humber employed 119 pilots who were rostered on a 10 days on, 8 days off duty cycle. Each pilot was authorised by the CHA using a class system. Class-1 pilots were authorised to pilot vessels of less than 40,000 tonnes (t) deadweight or less with a draught of less than 11m. Class-2 pilots were authorised to pilot vessels of less than 20,000t with a draught of less than 8.5m. Class-3 pilots were authorised to pilot vessels of 10,000t deadweight or less with a draught of 7m or less.

1.5.3 Pilot safety training

ABP Humber's pilot safety training included biannual man overboard training. This required pilots to view a PIW training video that included instructions to pilots to read the risk assessment and procedures for boarding vessels, check their PPE, and to follow the directions of the pilot vessel crew. Pilots were also required to observe a pilot vessel's crew recover a manakin from the sea using the vessel's MateSaver and PIW recovery platform. Safe embarkation and disembarkation from vessels underway using a pilot ladder was taught on the job during their initial pilot training. Since joining ABP Humber, none of the three ABP Humber pilots on board *Humber Saturn* at the time of the accident had received sea survival or first aid training, including the use of a defibrillator.

1.5.4 Pilot transfers at sea

ABP Humber's risk assessment *RA003 – boarding and landing to/from a pilot launch at sea*, stated that the consequences of an accident ranged from minor injury to death and listed several control measures to manage the risk:

- *Training to be given in use of PPE & boarding / landing procedures*
- *Visual inspection of pilot ladder before use*
- *Incorrectly rigged or damaged pilot ladders to be replaced*
- *PPE to be used (high-visibility jacket with lifejacket, safety helmet; safety glasses, safety shoes; and, gloves)*
- *Adequate lighting*
- *Vessel to comply with SOLAS regulations*
- *Defects to be reported*
- *Deckhand to be in attendance*
- *Follow UK Maritime Pilot Association's (UKMPA), Embarkation and disembarkation of pilots – code of safe practice* [sic]

The risk assessment's control measures did not include the medical fitness of the pilot who was embarking or disembarking.

1.5.5 Pilot medical fitness

ABP Humber required its pilots to hold a valid ENG1 seafarer's medical fitness certificate issued by an Approved Doctor (AD) authorised by the Maritime and Coastguard Agency (MCA). The company contracted pilot health assessments and the issuing of ENG1s to an independent occupational health provider (OHP), PAM Group Limited. The 'on-demand' contract with the OHP offered direct access to a range of health assessment services, including psychological wellbeing. Pilots could contact the OHP via a helpline before contacting their line manager.

ABP Humber had no specific health standard for its pilots other than the requirement to hold a valid ENG1. There was no requirement for pilots to demonstrate their physical ability to climb a pilot ladder.

1.5.6 Accident prevention

In 2016, ABP introduced its 'Beyond Zero' safety culture. Part of 'Beyond Zero' was the 'Spot-It!' accident and near miss reporting initiative. All ABP Humber employees received training on these initiatives on joining the company and then received annual 'Beyond Zero' refresher training thereafter. 'Beyond Zero' was designed to:

> *…capture any environment, marine, safety or security incident, near miss or observation that has or could cause an injury to someone, a security issue or impact the environment. The system can also be used to capture the examples of best practice you see in your port. By recognising and reporting a situation, action can be taken in time to prevent an accident or to share positive learning across ABP. Please keep your eyes open, report anything of concern or interest, whether onshore or offshore and help embed our Beyond Zero culture of looking out for each other.* [sic]

'Beyond Zero' empowered employees to stop others from working to prevent an unsafe act.

1.6 THE PILOT

1.6.1 Overview

Francesco Galia was 67 years old and had worked as a seafarer for many years before joining ABP Humber as a pilot in March 2002. He became a Class-1 pilot in November 2012.

1.6.2 Personal protective equipment

The pilot's personal protective equipment (PPE) included safety boots; a safety helmet with a visor and chinstrap; a high-visibility waterproof coat with an integral lifejacket; a harness; a PLB; and gloves. He also wore thin suit-type trousers.

1.6.3 Work pattern

The pilot's worked hours report showed he had completed seven pilotage jobs since starting his duty cycle at 1025 on 31 December 2022. The report showed that these jobs were between 4 hours and 10 hours long and conducted in daylight. The pilot's most recent job ended[10] at 1646 on 7 January 2023.

[10] The end time for a pilotage job was the time that the pilot clocked off at Hesslewood.

1.6.4 Medical history

On 14 June 2011, the pilot suffered a heart attack while piloting a vessel in the port and was airlifted to hospital for treatment. The pilot's ENG1 was subsequently suspended for 3 months. The pilot returned to duty in January 2012, following successful cardiac rehabilitation and a step test. The pilot had since suffered from several chronic health conditions, including high blood pressure, knee pain and obesity, which led to him being periodically signed off work or authorised to work a reduced shift pattern.

In October 2018, the pilot suffered a stroke while at home. In 2019, he was referred to ABP Humber's OHP three times and, while he returned to work for short periods, he declined the offer of a full cardiac assessment and was advised by the doctor to lose weight.

In May 2019, the pilot was involved in a berthing incident that resulted in significant damage to the vessel. He subsequently reported that he was under considerable personal stress. The pilot was suspended and, after completing a period of rehabilitation and support and a retraining package, returned to work on a reduced shift pattern[11] and was authorised to work as a Class-2 pilot.

On 15 June 2022, the pilot underwent an ENG1 medical examination by an AD. Notes from the examination, recorded on a medical examination of seafarers report (ENG2), did not indicate that the pilot had declared his heart condition or that his blood pressure was too high. The ENG2 also recorded that: the pilot weighed 130kg and had a BMI of 40.1 (severely obese[12]); his blood pressure readings were 140 systolic (top line) and 90 diastolic (bottom line), indicating raised blood pressure. The pilot did not bring his previous ENG1 with him to the examination, given that this examination was conducted by a doctor who had examined him before. On completion of the medical examination the pilot was issued with a Category 1 ENG1 declaring him fit with no limitations or restrictions on his fitness.

In August 2022, the pilot was referred to ABP Humber's OHP for a psychological wellbeing assessment. In response, the OHP informed the pilot's line manager that the pilot was fit to undertake pilotage duties.

1.7 *HUMBER SATURN*

1.7.1 Overview

Humber Saturn was one of six pilot vessels operated by ABP Humber. The vessel was certified to operate by the MCA (see paragraph 1.8.4). *Humber Saturn* was crewed by a coxswain and deckhand to transfer pilots to and from vessels within the port. At the time of the accident the vessel was in date for survey and inspection.

Humber Saturn's crew held valid Maritime Immediate Emergency Care and elementary first aid certificates. The crew's training record also showed that they had completed a PIW drill while underway in December 2022.

[11] At the time of the accident the pilot was restricted to daytime working only.

[12] https://www.nhs.uk/conditions/obesity/

1.7.2 Recovery of a person in the water

To recover a PIW, *Humber Saturn* had an electro-hydraulic recovery platform mounted on its transom **(Figure 4c** inset**)** that was designed to lift a PIW horizontally from the water to the level of the vessel's main deck.

A pump powered by *Humber Saturn*'s batteries provided the recovery platform's primary source of hydraulic power. A control box, connected by an umbilical cable, enabled the crew to raise and lower the recovery platform. This operated a solenoid valve that directed hydraulic oil flow to the recovery platform's lifting/lowering mechanism, which consisted of hydraulic rams connected to supporting steel wires. The recovery platform could also be operated using a hydraulic hand pump located in the void space adjacent to *Humber Saturn*'s transom. This pump supplied hydraulic oil to the lifting/lowering mechanism via manual operation of the same directional solenoid valve.

Humber Saturn's PIW recovery procedure required the coxswain to manoeuvre the pilot vessel alongside the PIW. Once the deckhand had attached the MateSaver MOB rescue pole to the PIW the coxswain would stop the engines, leaving the ignition on, and head aft to lower the recovery platform. Once the recovery platform had been lowered the deckhand would float the PIW onto the platform and the coxswain would raise the platform to main deck level. Both crew would then transfer the PIW into the wheelhouse for first aid treatment.

Humber Saturn was not fitted with an alternative means of recovering an unconscious PIW. For example, the vessel did not have a davit and harness arrangement that could be operated independently of the ship's power and used if the recovery platform was defective.

1.7.3 Recovery platform inspection, testing and maintenance

*Humber Saturn'*s crew raised and lowered the recovery platform daily to confirm that it operated and conducted PIW drills using the platform to recover a training manikin every month. The crew raised any identified faults for rectification by ABP Humber's maintenance team.

The pilot vessel's recovery platform had been proof load tested to 240kg when the vessel was new. There was an identification plaque **(Figure 5)** on board showing that the recovery platform was rated to lift one person and had a safe working load (SWL) of 160kg. The recovery platform was inspected and tested to the requirements of the Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006 (MSFV LOLER)[13] and it had most recently been proof load tested, to 240kg, on 30 July 2021. A specialist contractor conducted 6-monthly inspections in line with MSFV LOLER Regulation 12; the most recent was carried out on 5 September 2022, during which no defects were noted.

Figure 5: *Humber Saturn*'s recovery platform identification plaque

[13] See section 1.8.7

ABP Humber's maintenance team conducted routine maintenance and defect rectification of the pilot vessels. In the 5 years leading to the accident over 20 defects had been reported for *Humber Saturn*'s PIW recovery platform, which included defects with the lifting wires; limit switches; and sticking solenoid valves. ABP Humber's pilot vessel maintenance management system did not identify these as safety significant defects. In the past, reported defects had delayed the vessel being issued with its MSFV LOLER certificate.

Humber Saturn's crew had checked the operation of the recovery platform on the morning of the accident without issue. The recovery platform had no recorded outstanding defects at the time of the accident.

1.7.4 Recovery platform post-accident inspection and testing

On the morning of 9 January 2023, the MCA conducted an inspection of *Humber Saturn*'s recovery platform and reported that:

> *… the platform was operated in the light condition with engine power which raised the platform in approximately 20 seconds. A load consisting of a MoB dummy and other weights totalling approximately 100Kg was then loaded onto the platform and the test repeated on engine power. Again the platform was raised in approximately 20 seconds. The test was then repeated using the batteries only and the platform was raised in approximately 20 seconds once more.*

On 11 January 2023, an independent contractor inspected the recovery platform and when it had been loaded to 160.8kg found that:

- The recovery platform's solenoid valve was defective. If the platform was lowered, the solenoid valve jammed and did not allow the platform to be raised; and,

- The fixing bolts on a limit switch were loose. This meant the platform did not automatically stop when it reached its limits.

The recovery platform loaded to its SWL worked as designed once the solenoid valve was replaced and the limit switch had been reattached.

1.8 REGULATION AND GUIDANCE

1.8.1 Health and safety at work

While most UK marine pilots start their professional careers as seafarers, when operating as pilots they are shore workers employed in a marine environment, governed by the Health and Safety at Work etc. Act 1974 and The Management of Health and Safety at Work Regulations 1999.

This legislation required ABP Humber to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all its employees[14]. The Health and Safety Executive (HSE) guidance on occupational health[15] advised that employers *must... make sure workers' health is not adversely affected by their work and that workers*

[14] Health and Safety at Work etc. Act 1974, Part 1, Section 2 (1).

[15] https://www.hse.gov.uk/health-surveillance/occupational-health/index.htm

are medically fit to carry out their work safely. The guidance advised that actions to determine a necessary health standard should be determined by a risk assessment of the employees' role and that relevant industries may produce standards to assist in this activity. This aligned with CHAs' powers under the Pilotage Act 1987, which allowed ports to determine the required physical fitness level of their pilots[16].

The pilots, as employees, were in turn required to take reasonable care of their own health and safety as well as that of others who might be affected by their work. Further, employees were required to cooperate with their employer's health and safety arrangements.

1.8.2 International Maritime Organization

While UK marine pilots are shore workers employed in a maritime environment, International Maritime Organization (IMO) Resolution A.960(23)[17] stated that each pilot should satisfy the competent pilotage authority that their medical fitness met the standards for masters and officers required by the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers. The IMO Resolution went on to require that if a pilot experienced injury or illness their medical fitness should be re-evaluated before they return to duty.

IMO Resolution A.960(23) also encouraged pilotage authorities to provide updates and refresher training to their pilots. This training could include personal safety training; techniques for personal survival at sea; and emergency first aid, including CPR and hypothermia remediation[18].

IMO Resolution A.1045(27) described pilot transfer arrangements and stated that:

> *When a retrieval line is considered necessary to ensure the safe rigging of a pilot ladder, the line should be fastened at or above the last spreader step and should lead forward. The retrieval line should not hinder the pilot nor obstruct the safe approach of the pilot boat*[19].

1.8.3 UK seafarers medical certification

Merchant Shipping Notice (MSN) 1887 (M)[20] detailed the ENG1 and domestic medical fitness (ML5) report and certification process for UK seafarers. MSN 1887 (M) required the seafarer's medical examination to be conducted by an MCA-authorised AD. Further, the MSN stated that these examinations must take place every 2 years unless the AD specified a shorter duration.

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[16] Pilotage Act 1987, section 3(2), as amended.

[17] Recommendations on Training and Certification and on Operational Procedures for Maritime Pilots other than Deep-sea Pilots, adopted 5 December 2003.

[18] IMO Resolution A.960(23) section 5.5

[19] IMO Resolution A.1045(27) section 2.1.5

[20] MSN 1887 (M), Maritime Labour Convention, 2006: Medical Certification.

The ENG1 and ML5 mandatory fitness standards were set out in MSN 1886 (M+F) Amendment 2[21]. The general principles, section 3.3, stated that the AD:

> *…should be satisfied that no condition is present which is likely to lead to problems during the voyage and no treatment is being followed which might cause adverse side effects.* [sic]

Section 3.5 of MSN 1886 (M+F) Amendment 2 defined four categories of medical fitness that could be determined by an AD when assessing medical fitness:

> ***Category 1: Fit** for sea service, with no restrictions*
>
> ***Category 2: Fit** for sea service **but with restrictions***
>
> ***Category 3: Temporarily unfit** for sea service. The Approved Doctor must specify the duration of the period of unfitness.*
>
> ***Category 4: Permanently unfit** for sea service. This category will normally be considered to last for a minimum of five years and may only be changed at a later date if an Approved Doctor is presented with medical evidence of the reversal of the original medical condition. Review by a medical referee may also be required.* [sic]

The *Approved Doctor's Manual, Seafarer Medical Examinations*[22] (ADG) provided ADs with further guidance on:

- Obesity (ADG 5) – this recommended that seafarers with a BMI of more than 35 should be further assessed by the AD for cardiovascular risk and physical capabilities (ADG17).

- Physical capabilities (ADG17) – this observed a seafarer's ability to do routine or emergency tasks or used a step test to establish their maximum oxygen uptake.

- Blood pressure and its measurement (ADG 8) – this allowed the AD to declare a seafarer fit for sea service if they were under regular medical review for their condition, compliant with recommended treatment for their high blood pressure and free from impairing side effects.

- Cardiac events (ADG 9) – this required the AD to declare a seafarer temporarily unfit until 3 months after a cardiac event. Following a successful stress test assessment, ADG 9 required all seafarers who had experienced a cardiac event[23] at any time to be assessed for the *level of excess risk of recurrence*. An appropriate certificate was issued based on the risk of recurrence and the assessment was to be repeated every 3 years. ADG 9's guidance as to how this risk was assessed included a Bruce protocol step test or a normal stress echocardiogram. If there was significant difficulty in obtaining an exercise test then a cardiologist's opinion of the level of excess risk of recurrence should be

[21] MSN 1886 (M+F) Amendment 2 – Maritime Labour Convention, 2006 Work in Fishing Convention 2007 (ILO No.188) Medical Examination System: Appointment of Approved Doctors and Medical and Eyesight Standards.

[22] https://www.gov.uk/government/publications/the-approved-doctors-manual

[23] Cardiac events included myocardial infarction, electrocardiogram evidence of past myocardial infarction or newly recognised left bundle branch block, angina, cardiac arrest, coronary artery bypass grafting, and percutaneous coronary intervention.

sought, and if the risk was assessed at less than 2% per year then the test may be omitted. In summary, this assessment was required for all seafarers who had suffered a cardiac event, not just within the last 3 months, and ADG 9 provided guidance on how the information may be obtained.

The ADG advised ADs to tell seafarers to bring to the medical examination their discharge book or other proof of identity; previous ENG1; spectacles or contact lenses, if worn; any medication; and, any medical documentation. The ENG1 process also relied on the seafarer accurately sharing their medical history, which the AD recorded on the ENG2 form.

1.8.4 Pilot vessel regulation

At the time of the accident *Humber Saturn* was a non-SOLAS[24] vessel certified to operate in line with MCA's The Safety of Small Workboats and Pilot Boats – A Code of Practice (Brown Code). Section 22.5 of the Brown Code required the pilot vessel to have:

> *Efficient mechanical means for the retrieval of any person who falls overboard and means to bring the person in the water to the retrieval point. Where practicable, the arrangement should enable the person to be retrieved in the horizontal position, in order to reduce the risk of heart failure associated with hypothermia.*
>
> *The quality of materials, design and workmanship of construction of the mechanical means of retrieval should ensure that it can be rapidly deployed and will operate efficiently in an emergency. The efficiency of the equipment should be ensured by regular maintenance and testing.*

1.8.5 Pilot vessel recovery equipment guidance

Marine Guidance Note (MGN) 544 (M+F)[25] provided guidance to both SOLAS and non-SOLAS vessels. For non-SOLAS vessels, such as *Humber Saturn*, the guidance required PIW recovery methods to:

- be covered by a documented risk assessment
- facilitate the recovery of the PIW while minimising the risk of injury from the ship's side or other structures
- recover the PIW in a horizontal or near-horizontal position
- be clearly marked with the maximum number of persons, based on a weight of 82.5kg per person
- be conducted clear of the ship's propellers
- have means of illumination and, where required, an available power source for the area where the recovery operation is conducted.

[24] Not required to comply with the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended.

[25] MGN 544 (M+F) Life-Saving Appliances – Means of Recovery of Persons from the Water by Ships and Boats – Plans, Procedures, and Acceptance of Recovery Equipment.

1.8.6 The Embarkation and Disembarkation of Pilots Code of Safe Practice

The Embarkation and Disembarkation of Pilots Code of Safe Practice (the Boarding and Landing Code) was jointly produced in 2021 by the British Ports Association, the United Kingdom Maritime Pilots' Association, the UK Harbour Masters' Association, the UK Major Ports Group, and Port Skills and Safety Limited.

The Boarding and Landing Code was designed to assist CHAs and pilot organisations to establish safe operating procedures for pilot operations within ports. The Boarding and Landing Code advised that:

- *A clear decision whether the pilot boat should remain alongside or not during the transfer should be made between Pilot and coxswain prior to the Pilot leaving the cabin. Taking into account:*

  a) The height of climb

  b) The pilot ladder arrangement

  c) Prevailing environmental conditions.

  If, under these circumstances, the pilot boat leaves the ship's side particular care must be made not to foul the ladder. [sic]

- pilot vessel crews practised PIW recovery at least every 6 months

- all pilotage staff were trained in sea survival techniques

- unless risk assessed and part of approved PPE, rucksacks and bags should not be worn while climbing the pilot ladder because:

  a) Wearing a bag will impair the ability to climb

  b) A bag with the straps over the shoulder or across the chest can impair the inflating of a lifejacket or pilot coat

  c) When falling from a ladder the shape and size of the bag will affect the stresses on the body when hitting the water

  d) The angle of float created by a lifejacket or pilot coat could be compromised by pockets of air within the contents of the bag [sic]

1.8.7 Inspection and testing of lifting equipment

The MSFV LOLER[26] regulated the use of lifting equipment on board UK vessels.

Regulation 11, Testing, stated that:

> *The employer shall ensure that the ship's lifting equipment (other than an accessory for lifting) is not used unless it has been suitably tested by a competent person within the preceding five years.*

[26] Further guidance on the application of MSFV LOLER was provided in MGN 332 (M+F) Amendment 2 – The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006, which was in force at the time of the accident.

Regulation 12, Thorough examination and inspection, stated that:

> *…the employer shall ensure that where lifting equipment or an accessory for lifting is exposed to conditions causing deterioration which is liable to result in dangerous situations, it is*
> *(a) thoroughly examined—*
> *(i) in the case of lifting equipment for lifting persons or an accessory for lifting, at least every 6 months;*

Section 19.5 of the Code of Safe Working Practices for Merchant Seafarers, Amendment 7[27] (COSWP) advised that there was a legal requirement for lifting equipment to be tested every 5 years.

Where the proof loading formed part of the test, lifting equipment with an SWL of 0t to 10t, COSWP recommended a proof load of SWL x 1.25.

1.9 REFERENCE INFORMATION

1.9.1 Pilot training at other UK ports

In 2021, a major UK port group reviewed its risk assessment for the safe embarkation and disembarkation of pilots and marine personnel within its ports. This led to the port group introducing improved PPE and a 1-day pilot ladder safety training course at a UK nautical college in addition to the requirement for its pilots and marine personnel to hold a valid ENG1. The pilot ladder safety training course comprised of classroom and practical training. The classroom phase informed pilots how to assess pilot ladders for defects, the risks of climbing a pilot ladder and the techniques to employ while doing so.

The practical training was conducted in a swimming pool and on a shoreside tower for pilots to demonstrate their ability to:

- Safely transfer to and from a pilot ladder to a vessel in a variety of conditions. The college's swimming pool rig allowed pilots to simulate transfers in different sea states, as well as by day and night.
- Climb a 9m pilot ladder while attached to fall arrest equipment.
- Move across from the pilot ladder to an accommodation ladder.
- Safely enter the water from height to simulate falling from a pilot ladder.
- Correctly employ sea survival techniques using their PPE and understand the recovery methods employed by pilot vessel crews.

[27] Published on 24 October 2022 and withdrawn on 5 April 2024.

1.9.2 Pilot health assessment standards – Australia

Transport for New South Wales (TfNSW) produced a *Standard for Health Assessment of Marine Pilots* that required pilots to undergo a bespoke musculoskeletal assessment of their ability to:

- rotate, flex and extend their neck
- apply adequate hand grip strength
- support 60% or more of their body weight using their arms, while gripping ropes with their hands, for 6 seconds
- support their body weight on their elbows and toes, while maintaining a straight back, for 60 seconds
- absorb and use oxygen during aerobic activity.

A pilot with a BMI of more than 35 was categorised as unfit until their BMI reduced to a satisfactory level. A BMI of more than 35 would also trigger the pilot's automatic referral for assessment for sleep disorder.

1.9.3 Offshore wind farm health assessment standards – UK

RenewableUK (RUK) set the medical standards for wind farm workers in the renewable energy sector. RUK offshore medicals had replaced the MCA seafarer's medical due to the unique challenges faced by those working offshore. RUK's *Medical Fitness to Work – Wind Turbines (January 2013)* set out:

- *A health assessment to detect and assess any medical conditions that may compromise safety by creating a risk of falling or sudden incapacity requiring rescue; and*
- *A medical fitness assessment to assure capability for regular climbing of vertical ladders…*[sic]

Under the RUK medical standard OHP providers were required to assess a worker's individual fitness to climb by: establishing their maximum oxygen uptake using a shuttle run or step test. The medical standard also required candidates to have a suitable level of cardiovascular fitness.

1.9.4 Cold water immersion

The RNLI defined cold water as anything below 15°C. Immersion in cold water can lead to death in the following ways:

- Cold water shock – occurs within the first 30 seconds to 2 minutes following sudden immersion and is associated with a gasp reflex, hyperventilation and a rapid increase in heart rate and blood pressure as the body encounters cold water. If the head goes underwater during this stage, the inability to hold breath will often lead to water entering the lungs in quantities sufficient to cause death. Cold water shock response is considered to be the cause of the majority of drowning deaths in UK waters.

- Cold incapacitation – usually occurs within 2 to 15 minutes of entering the water. The blood vessels become constricted as the body tries to preserve heat and protect vital organs. This results in restricted blood flow to the extremities, causing cooling and consequent deterioration in the functioning of muscles and nerve ends. Hands and feet lose useful movement, leading to progressive incapacitation of arms and legs. Unless a lifejacket is correctly worn, death by drowning occurs because of impaired swimming.

- Hypothermia – a potentially dangerous drop in body temperature to below 35°C (it is normally around 37°C). The body's core temperature can continue to drop after the casualty has been recovered from the water if rewarming efforts are ineffective.

1.9.5 Pilot vessel position during pilot embarkation and disembarkation

The Fédération Française des Pilotes Maritimes (FFPM) reviewed French pilot accidents over a 20-year period in its *Pilot Boarding – Accidentology* survey. The video[28] of FFPM's findings identified that a cause of the most serious accidents was a pilot falling from the ladder onto the pilot vessel. FFPM's video showed the effect of pilot falls at various heights, noting that a 3m fall could result in serious injury while a fall from 8m could result in death.

1.10 PREVIOUS/SIMILAR ACCIDENTS

1.10.1 Pilot ladder incidents and accidents

In 2022, the MAIB canvassed 105 UK CHAs for their pilot transfer statistics. The results revealed that, every year, almost 700 pilots conducted 96,000 transfers underway using a pilot ladder[29]. The most serious reported injury was caused when a pilot lost their grip on the handhold stantion and fell 3m onto the pilot vessel, fracturing their ankle. In the last decade, one other pilot accident in the UK has resulted in fatality (see section 1.10.2).

The MAIB's CHA questionnaire responses established that approximately 60% of UK ports required their pilots to meet a specific medical standard, generally the ENG1 or ML5.

1.10.2 *Sunmi*/*Patrol* – UK fatal pilot accident

On 5 October 2016, a pilot was attempting a climb of less than 1m to board the general cargo vessel *Sunmi* from the pilot vessel *Patrol* on the River Thames when he fell and was crushed between the two vessels (MAIB report 21/2017[30]). Despite prompt medical attention the pilot died at the scene.

The MAIB investigation could not establish whether the fall was a result of the pilot's use of *Sunmi*'s deck gate, a problem with his knee following recent surgery, loss of coordination due to his blood alcohol content, or a combination of all three. One of

[28] https://www.youtube.com/watch?v=IX0LqauaIVo

[29] https://www.gov.uk/government/publications/maib-annual-report-2022

[30] https://www.gov.uk/maib-reports/accident-during-pilot-transfer-between-general-cargo-vessel-sunmi-and-pilot-transfer-vessel-patrol-with-loss-of-1-life

the investigation's conclusions was that *appropriate fitness requirements for pilots can only be identified through risk assessment of their specific duties at their port of employment*[31].

Following the investigation the Port of London Authority revised its drug and alcohol policy; risk assessment for pilot transfers; fitness assessment procedures; and, training and guidance to all staff.

1.10.3 *Singapore Express* – Portugal fatal pilot accident

Shortly after midnight on 28 February 2018, a pilot fell from a pilot ladder while disembarking from the container ship *Singapore Express* off Lisbon, Portugal (GAMA[32] reference:2018-029). The pilot fell into the water while attempting to step from the ladder onto the pilot vessel. The pilot vessel then manoeuvred to recover the pilot via its transom ladder, but the pilot was unable to hold onto the ladder and climb it in the 2m to 3.5m waves. The pilot vessel's crew then made several more attempts to recover the pilot without success. After more than 100 minutes in the water, the pilot was recovered unconscious to a Portuguese lifeboat and was later declared deceased.

The investigation found that there was no emergency procedure for the pilot vessel's crew to recover an unconscious PIW and that the pilot vessel's recovery davit was unfit for purpose. The cold seawater temperature was also judged to have limited the pilot's physical ability to assist in his own recovery.

[31] MAIB report 21/2017 section 3.3: Safety issues not directly contributing to the accident that have been addressed or resulted in recommendations.

[32] GAMA is the Portuguese maritime accident investigation office. Copies of this report can be requested by email to iam@gama.mm.gov.pt

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 FATIGUE

The pilot finished his previous job at 1646 on 7 January 2023, over 17 hours before he was contacted by VTS Humber informing him that he was to pilot *Finnhawk*. While the pilot told the trainee pilot that he had not rested well, he did not report that he was fatigued or unfit to work and his work pattern had provided him with the opportunity to take adequate rest before starting work on 8 January

2.3 PILOT LADDER

Finnhawk's pilot ladder retrieval line was secured just below the last spreader and led aft rather than forward contrary to IMO Resolution A.1045(27). However, the retrieval line did not hinder or obstruct the safe approach of the pilot boat or affect the outcome of this accident.

2.4 THE ACCIDENT

2.4.1 Fall from the pilot ladder

Before boarding *Humber Saturn*, the pilot reported that he was experiencing lower back pain and sciatica. It is possible that these medical conditions may have caused him to lose his grip or footing and fall from the pilot ladder while boarding *Finnhawk*. However, given the postmortem finding that there was *compelling pathological evidence* that the pilot *was at risk of a sudden cardiac event occurring at any time* it is probable that he suffered a cardiac event during the climb. This would explain why observers saw the pilot suddenly lean back, let go of the ladder by releasing both hands simultaneously, and fall backwards onto *Humber Saturn* without making a sound.

2.4.2 Impact and injury striking the pilot vessel

The pilot struck *Humber Saturn*'s deckhouse and safety rail, and the impact resulted in his safety helmet breaking. In the absence of other injury mechanisms, it is highly likely that the injuries to the pilot's back occurred at the same time[33]. In his injured state the pilot was unable to prevent himself from falling into the sea and, while *Humber Saturn*'s deckhand attempted to grab hold of the pilot, they were unable to do so in time.

2.4.3 Cold water shock

The pilot was instantly immersed in cold water before his lifejacket inflated. It is very likely that he would then have experienced uncontrolled breathing and a rapid increase in heart rate due to the effects of cold water shock and, as

[33] See section 1.3

the pathologist's report indicated, ingested seawater. These reactions, as the pathologist assessed, could also have provoked a cardiac event and probably led to the pilot losing consciousness and possibly drowning.

2.4.4 Cold water immersion

Humber Saturn's crew quickly manoeuvred the pilot vessel alongside the injured pilot and moved him onto the vessel's lowered recovery platform; however, a defect prevented them from being able to recover him to the main deck. The injured pilot consequently remained partially immersed in cold seawater for over 40 minutes on the lowered recovery platform, during which the crew were unable to assess his condition, carry out first aid, begin CPR or employ the pilot vessel's defibrillator. It is almost certain that the pilot's immersion in cold water and the delay in his recovery and first aid treatment significantly reduced his chance of survival.

2.5 PILOT FITNESS

2.5.1 Seafarer medical examination

Since the pilot's heart attack in 2011, his fitness had been affected by several chronic health conditions including a stroke, heart disease, high blood pressure, stress, kidney disease, and obesity. The Home Office pathologist noted that the pilot's medical history would have placed him at risk of a sudden cardiac event occurring at any time, and without warning. However, an MCA AD had examined the pilot 6 months before the accident and issued a Category 1 ENG1 that declared him fit for sea service with no restrictions.

The purpose of the MCA seafarer medical examination was to enable the examining AD to *be satisfied that no condition is present which is likely to lead to problems during the voyage*[34]. While the AD did not have digital access to the seafarer's medical records from the ENG1 process, the AD had examined the pilot before and it is likely that the pilot's notes from previous examinations were available to them. Additionally, the ENG process required the seafarer to self-declare key aspects of their medical history before being examined by the AD.

The MCA's ADG allowed the AD to declare a pilot with raised blood pressure (140/90) fit for sea service if the condition was well managed and the pilot had no side effects. However, the pilot's BMI (40.1) was sufficiently high that an assessment of his physical capabilities was required. This assessment required the pilot to demonstrate that he could undertake routine or emergency tasks or complete a step test to establish his maximum oxygen uptake without placing undue strain on his heart; assessments that, given his size and blood pressure, could have resulted in him being declared temporarily unfit for sea pending further specialist medical opinion, or issued with a restricted certificate. Additionally, the notes from the pilot's ENG1 examination show that, although he informed the AD of his high blood pressure, he had not declared his heart conditions.

The pilot's seafarers' medical assessment, conducted by an MCA AD only 6 months before the accident, did not follow the MCA's guidance and was incomplete. If the AD had followed this guidance and assessed the pilot's physical capability they would probably have declared him either temporarily unfit for sea or issued him with a restricted certificate to work as a marine pilot. Further, if the AD had referred to

[34] MSN 1886 (M+F) Amendment 2.

their notes from the previous examinations, or the pilot had declared all his health conditions to the AD, it is highly likely that this information would have resulted in the pilot being declared either temporarily medically unfit or only fit for restricted sea service.

2.5.2 Access to medical records

Without access to a seafarer's medical records, ADs rely on full disclosure of any health conditions by seafarers during their ENG1 examinations. In part, this self-declaration process aligned with the international rules that underpinned UK regulations. However, a seafarer's desire to continue to work could lead to them misrepresenting their medical history to an AD so as to be declared medically fit for sea service. It is therefore important that ADs refer to the paper medical records when their practice has examined the seafarer before.

At the time of the pilot's examination the MCA's records management system did not permit ADs to access a seafarer's previous ENG records electronically. The inability to electronically access the pilot's medical history was further exacerbated as the pilot had not brought his previous ENG1 certificate with him to the medical examination. Had the AD been able to view the pilot's previous ENG1 and ENG2 documentation online they would have been aware of the pilot's heart attack and stroke. Had the AD referred to the pilot's records from previous examinations by the company this might also have allowed them to more accurately assess the pilot's fitness for sea service.

2.5.3 Occupational health assessment

UK health and safety legislation required ABP to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all its employees. Further, the HSE guidance was that any employer actions to ensure its workers were medically fit to undertake their role should be determined by a risk assessment, and that industry standards may be available. This aligned with the powers under the Pilotage Act 1987 for CHAs to set the medical standards for their pilots. ABP had not derived its own occupational health standard for its pilots and, in common with other CHAs, had instead relied on ENG1 or ML5 certificates along with OHP support to provide assurance they were fit to work.

Since his heart attack in 2011, the pilot had experienced several medical issues and had been referred to the OHP on seven occasions. The most recent referral, for a psychological wellbeing assessment, was made 5 months before the accident; however, having talked with the pilot, the OHP's opinion on that occasion was that he remained fit for duty.

Without a clear occupational standard for an employee's role, it can be difficult for an OHP to balance the individual's desire to return to work with their professional assessment of whether it is safe for them to do so. The standards in place for pilot and offshore wind farm health assessments at TfNSW and RUK included a review of the employee's medical history and a test of their physical capability. These physical assessments required the pilot or wind farm worker to demonstrate their ability to meet the specific demands of their role through climbing and aerobic activity tasks that tested their strength and maximum oxygen uptake.

Given the wide range of marine traffic within UK CHAs, as concluded in the *Sumni*/*Patrol* investigation (see 1.10.2), the appropriate fitness requirements for a CHA's pilots can only be determined by assessing the risks associated with and specific to their port's activities. For example, some ports will routinely handle large vessels that require pilots to climb significant heights to board a vessel, while other ports served by smaller vessels may only require the pilot to climb 1m to 2m. That said, there is little guidance to CHAs as to how to create a suitable occupational standard that assesses a pilot's health and physical capability to safely fulfil their role.

2.6 INABILITY TO RECOVER THE PILOT FROM THE WATER

Humber Saturn was manoeuvred alongside the pilot within a minute of his fall into the water and the MateSaver MOB rescue pole was then used to quickly guide him towards the vessel's stern. However, the crew were then unable to recover the pilot on board because the vessel's PIW recovery platform could not be raised. Since there was no alternative means of lifting a PIW the pilot remained on the recover platform.

Humber Saturn's recovery platform, which was rated to lift one person and had an SWL of 160kg, complied with the Brown Code and the guidance in MGN 544 (M+F). Further, as required by MSFV LOLER Regulation 11, the platform had been tested within the previous 5 years, in July 2021, and the load test carried out at that time equated to SWL x 1.5 (240kg), which exceeded the requirements stated in COSWP. The most recent MSFV LOLER Regulation 12 examination and inspection had been carried out in September 2022, during which no defects were noted.

The operational test of the recovery platform carried out before the accident was successful, with no defects identified, and when tested post-accident the recovery platform operated and lifted approximately 100kg. During the subsequent inspection, one of the platform's solenoid valves was found to be defective and one of its limit switches was loose. It could not lift a test load of 160.8kg until these defects had been rectified.

It is possible that, at the time of the accident, these defects caused the recovery platform, loaded by the pilot (130kg plus the weight of wet clothing), to stick at the lowered position and render it incapable of lifting to its SWL. Since there were no alternative means of lifting a PIW (and this was not required by existing regulation and guidance), the pilot could not be recovered until assisted by the lifeboat crew.

Humber Saturn's maintenance records indicated regular and recurrent defects with the vessel's recovery platform. These appear to have been managed as part of defect rectification and not resulted in a change to the planned maintenance system for this equipment. Additionally, since the pilot vessel recovery platforms were not identified as safety critical items it is possible that the effect of any associated defects on the platform's availability in an emergency were not duly considered.

Humber Saturn's crew were unable to recover the pilot from the water because the pilot vessel's recovery platform did not operate at the time of the recovery, and they did not have an independent secondary means of conducting such a recovery.

2.7 PERSONAL PROTECTIVE EQUIPMENT

The pilot was wearing his ABP Humber issued PPE and his rucksack when he fell from *Finnhawk*'s pilot ladder. The pilot's safety helmet broke and fell off when he struck *Humber Saturn*. When the pilot entered the water, his integrated lifejacket inflated as designed, keeping his head above water, and his PLB activated. However, the pilot's work clothing was not designed to protect him from the effects of cold water immersion.

The pilot's PPE appears to have been partially effective. Although the safety helmet broke, it nevertheless prevented a head injury. While the pilot's integrated jacket and lifejacket kept his head and airway clear of the water, as the trainee pilot who suffered from hypothermia discovered, the approved pilot clothing of shirt, and thin suit-type trousers did not mitigate the debilitating effects of cold water. The pilot's postmortem examination report noted that *immersion in cold water can provoke a sudden cardiac event, especially if an individual has pre-existing heart disease*, and this may have caused him to lose consciousness and subsequently drown. Further, as the trainee pilot required treatment for hypothermia after about 40 minutes on the recovery platform, the pilot would have been similarly affected.

Pilot falls from the ladder into the water are a rare event in the UK. However, as seen in the *Singapore Express* case (see section 1.10.3), the effects of cold water immersion can significantly reduce a pilot's chance of survival. While the wearing of an immersion suit or other appropriate PPE can be hot and uncomfortable and not always practical for pilots, the port operator should thoroughly assess the risks associated with a pilot falling into cold water and implement suitable control measures.

While it has not been possible to determine whether the pilot's rucksack contributed to his injuries, the Boarding and Landing Code's advice not to wear rucksacks and bags *unless risk assessed and part of approved PPE* should have been followed.

2.8 STOP-WORK SYSTEM

While ABP Humber's 'Beyond Zero' safety culture empowered its employees to stop work to prevent an unsafe act, on the day of the accident the pilot's symptoms did not suggest that he was about to suffer a cardiac event. The pilot's colleagues made several timely and sensible interventions to allow the pilot the opportunity not to board *Finnhawk*; however, it is unclear whether they would have had the confidence to stop the pilot working if his symptoms had been more serious.

Safety specialists consider stop-work systems a supportive safeguard rather than an effective barrier to an accident. Employees are more likely to identify and report a technical fault, such as an incorrectly rigged or damaged pilot ladder, than report on a work colleague they consider to be potentially unfit for duty. Consequently, despite interventions by ABP Humber staff on boarding *Humber Saturn* in Grimsby, and immediately before boarding *Finnhawk*, the pilot was able to simply override his colleagues' concerns before proceeding to climb the ladder. In short, while the pilot's colleagues felt that they should challenge the pilot about his fitness to work, it is unclear whether they believed that they had the authority to stop him given his age, experience and long service.

For any form of stop-work system to be effective employees must feel supported and empowered by the company. It is also important to recognise that stop-work systems require constant reinforcement of a safety-first, no-blame culture by management. Organisations should therefore recognise and appropriately manage employee preferences for speaking up about workforce matters that might affect colleagues.

2.9 POSITION OF THE PILOT VESSEL

Humber Saturn was positioned beneath *Finnhawk*'s ladder when the pilot fell. Consequently, the pilot landed on the pilot vessel's safety rail and deck fracturing some of his vertebrae instead of falling into the sea. Further, the pilot was wearing a rucksack when he fell, which may have contributed to his injuries when he struck the pilot vessel.

The FFPM *Pilot Boarding – Accidentology* survey video illustrated that the risk of injury significantly increased when a pilot fell onto a pilot vessel's safety rail and hard deck rather than into the sea. However, while at the time of the accident the Boarding and Landing Code provided only limited guidance on the hazard posed by positioning of the pilot vessel during embarkation and disembarkation, this has now been expanded in the latest edition.

While the pilot's 2m to 2.5m fall likely did not directly cause his death it did result in a serious spinal injury. This illustrates the need for the pilot and pilot vessel coxswain to discuss and agree the positioning of the pilot vessel during the pilot's climb to minimise a potential injury should they fall.

2.10 PILOT SAFETY TRAINING

In this accident, *Humber Saturn*'s crew and pilots were unable to treat the injured pilot due to the inoperative recovery platform. However, had the pilot been recovered on board only the pilot vessel's crew were trained and qualified to deliver first aid and CPR; a capability that could have been compromised as the coxswain would have been conning the vessel and the deckhand's hand was injured. Further, the pilot lost consciousness before he could be recovered and could not therefore assist in his own rescue.

The IMO[35] and Boarding and Landing Code[36] guidance to CHAs was that pilots should be trained in sea survival, first aid and CPR. Another UK port group had introduced a pilot-specific training course that examined the risks associated with pilot embarkation and disembarkation, including sea survival. Despite the Code being a control measure for the port's risk assessment, ABP Humber's pilots had not received similar training and had not been trained in sea survival, first aid and CPR in line with IMO and industry guidance.

[35] IMO Resolution A.960(23).

[36] The Embarkation and Disembarkation of Pilots – Code of Safe Practice, dated July 2021.

SECTION 3 – CONCLUSIONS

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

1. It is probable that the pilot fell from *Finnhawk*'s pilot ladder because he suffered a sudden cardiac event. [2.4.1]

2. The pilot's chance of survival was significantly reduced by his immersion in cold seawater immediately after the fall and by his partial immersion on *Humber Saturn*'s defective lowered recovery platform for over 40 minutes. [2.4.3, 2.4.4]

3. The pilot's seafarer medical examination conducted 6 months before the accident did not follow the MCA's guidance and was incomplete. Correct assessment would probably have led to the pilot being declared either temporarily medically unfit or only fit for restricted sea service. [2.5.1]

4. The pilot's line managers had referred the pilot to the port's occupational health provider on several occasions, seeking guidance on his medical suitability for employment. However, without a clear occupational standard for the pilot's role, these assessments did not provide the port with a balanced opinion on whether it was safe for the pilot to work. [2.5.3]

5. *Humber Saturn*'s crew were unable to recover the pilot from the water because the pilot vessel's recovery platform did not operate at the time of the recovery, and they did not have an independent secondary means of conducting such a recovery. [2.6]

6. The pilot vessel's recovery platform had been tested in line with the regulations but, since it was not identified as safety critical equipment, it is possible that the effect of the regular and recurring defects on the platform's availability in an emergency was not duly considered. [2.6]

7. The pilot's work clothing of jacket, shirt, and thin trousers did not adequately protect him from sudden and prolonged immersion in cold water. [2.7]

8. The pilot fractured his vertebrae when he struck the pilot vessel because the vessel was positioned beneath the pilot ladder when he fell. [2.9]

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

1. The conduct of the pilot's seafarers medical examination was hampered by the Approved Doctor's lack of access to the MCA's digital medical records from his previous assessments. [2.5.2]

2. The port's stop-work system was ineffective because, despite several attempts by the pilot's colleagues to dissuade him from working that day, they could not prevent him from doing so. [2.8]

3.3 OTHER SAFETY ISSUES NOT DIRECTLY CONTRIBUTING TO THE ACCIDENT

1. The pilots had not been trained in sea survival, first aid and CPR in line with IMO and industry guidance. [2.10]

SECTION 4 – ACTION TAKEN

4.1 MAIB ACTIONS

The **MAIB** issued an interim report into this incident on 11 January 2024.

4.2 ACTIONS TAKEN BY OTHER ORGANISATIONS

The **Maritime and Coastguard Agency** has:

- Introduced the Approved Doctors Information System, which allows ADs to record and access seafarer medical examinations conducted in the UK.

Associated British Ports has:

- Completed an internal investigation into this accident. While the results of this investigation were subject to legal privilege, a report of its findings and the measures taken were shared with the MAIB.

- Completed a review of medical standards for its pilots and introduced an improved regime based on the existing seafarer's medical certificate accompanied by an enhanced occupational medical assessment of the pilot's fitness. The new system is currently mandatory for new pilots and voluntary for existing pilots.

- Conducted a full review of its pilot vessel recovery systems for persons in the water. This has resulted in all pilot vessels being provided with manually operated recovery cradles as an alternative recovery method for use when the recovery platform is unavailable.

- Reviewed the Maritime Immediate Emergency Care equipment on board its pilot vessels. This led to the vessels' stretchers and defibrillators being upgraded and the check-off cards being renewed.

- Improved its existing Stop-Work Intervention and Stop-Work Authority programmes to allow pilots and pilot vessel crews to veto unsafe actions. This initiative also forms part of the port's employee safety training.

Port Skills and Safety Limited, the **British Ports Association** and **UK Major Ports Group** Marine Pilotage Working Group, together with the **UK Harbour Masters' Association**, and the **UK Maritime Pilots' Association** have:

- Updated the Embarkation and Disembarkation of Pilots Code of Safe Practice to include guidance on:

    - Climb Zones in relation to the positioning of the pilot vessel while the pilot is on the ladder.

    - Guidance that pilots should maintain levels of fitness appropriate to their local transfer operation.

    - Guidance that an appropriate action plan should be agreed and shared by all parties with regard to onward casualty handling.

SECTION 5 – RECOMMENDATIONS

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

2026/103 Amend Marine Guidance Note 544 (M+F)), Life-Saving Appliances – Means of Recovery of Persons from the Water by Ships and Boats – Plans, Procedures and Acceptance of Recovery Equipment, to include guidance on the need for non-SOLAS vessels to carry an alternative means of recovery of an unconscious person from the water that does not rely on the use of shipboard systems or power.

Associated British Ports is recommended to:

2026/104 Risk assess, and where necessary enhance, its pilots' personal protective equipment to improve their survivability in cold water.

2026/105 Identify and report pilot vessel safety critical defects to an appropriate level of management so that safety trends can be identified and appropriate action taken.

The **UK Maritime Pilots' Association**, in collaboration with the **British Ports Association**, the **UK Harbour Masters' Association**, **UK Major Ports Group** and **Port Skills and Safety Limited**, is recommended to:

2026/106 Update the Embarkation and Disembarkation of Pilots Code of Safe Practice to include guidance to Competent Harbour Authorities on:

- the setting of occupational health standards for UK maritime pilots; and
- the provision of suitable personal protective equipment for pilots to improve their survivability in cold water.

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

Marine Accident Report