

SHERIFFDOM OF NORTH STRATHCLYDE AT OBAN

[2021] FAI 58

OBN-B33-20

DETERMINATION

BY

SHERIFF PATRICK HUGHES

UNDER THE INQUIRIES INTO FATAL ACCIDENTS AND SUDDEN DEATHS ETC
(SCOTLAND) ACT 2016

into the deaths of

PRZEMYSŁAW KRAWCZYK

and

DUNCAN MACDOUGALL

Oban, 15 December 2021

DETERMINATION

The Sheriff, having considered the information presented at the Inquiry, determines:

- (1) in terms of section 26(2)(a) of the Inquiries into Fatal Accidents and Sudden Deaths etc. (Scotland) Act 2016 (“the Act”), that Przemyslaw Krawczyk and Duncan MacDougall died on 18 January 2018 between 1800 hours and 2033 hours, the exact times being unknown, within the Fishing Vessel *Nancy Glen* (“the vessel”) at a location on lower Loch Fyne one and a half miles north-east of Barmore Island;

- (2) in terms of Section 26(2)(b) of the Act, that the accident which caused the deaths of Mr Krawczyk and Mr MacDougall took place on 18 January 2018 at a location on lower Loch Fyne one and a half miles north-east of Barmore Island;
- (3) in terms of Section 26(2)(c) of the Act, that the cause of death for both Mr Krawczyk and Mr MacDougall was drowning;
- (4) in terms of Section 26(2)(d) of the Act, that the said accident was caused by the vessel's trawl gear becoming embedded in the sea floor, causing a force to be imparted upon the vessel which it lacked the stability to withstand, resulting in its capsize;
- (5) in terms of Section 26(2)(e) of the Act, that a precaution which (i) could reasonably have been taken; and (ii) had it been taken, might realistically have resulted in the accident resulting in the deaths, and therefore the deaths, being avoided, would have been for the owners of the *Nancy Glen* to have taken professional advice before (a) having large amounts of the vessel's ballast removed in 2002 and 2016, and (b) making modifications to the vessel in December 2017, all of which significantly reduced the vessel's stability.
- (6) in terms of section 26(2)(f) of the Act, that a defect in a system of working contributed to the accident and the resultant death, in that instead of storing catch in the fish hold, it was standard practice on the *Nancy Glen* to store catch in water in tanks on the main deck and on the shelter deck, thus raising the vessel's centre of gravity and diminishing its stability.

(7) in terms of section 26(2)(g) of the Act, the following facts are relevant to the circumstances of the death:

- (i) that until recently no mandatory stability criteria have been applicable to vessels of the *Nancy Glen's* size;
- (ii) that masters of fishing vessels of the *Nancy Glen's* size are not required to undergo stability awareness training.

RECOMMENDATIONS

The Sheriff, having considered the information presented at the inquiry, makes the following recommendation in terms of 26(1)(b) of the Act:

1. That stability awareness training be made mandatory for masters of fishing vessels of between 7 and 16 metres in length.

NOTE

Introduction

[1] This was an inquiry held under the Fatal Accidents and Sudden Deaths etc. (Scotland) Act 2016 (“the Act”) into the deaths of Przemyslaw Krawczyk and Duncan MacDougall. Their deaths were first reported to the Crown Office & Procurator Fiscal Service on 18 January 2018. A notice of an inquiry was given by the procurator fiscal under section 15(1) of the Act on 8 December 2020.

[2] I pronounced a first order on 9 December 2020. Preliminary hearings were held on 3 February 2021, 12 March 2021, and 8 April 2021. Evidence was heard over eleven

days between 4 May 2021 and 1 July 2021. A hearing on submissions was held on 24 September 2021 when the court made avizandum.

[3] Parties entered into five joint minutes of agreement regarding uncontroversial evidence. In addition, the Inquiry heard evidence from the following witnesses:

- i. Malgorzata Krawczyk, widow of the deceased Przemyslaw Krawczyk
- ii. John Andrew Miller, only surviving crewman of the *Nancy Glen*
- iii. Walter Paul MacIntosh, team leader on the flatboat 'Lady Inger'
- iv. James Alexander Clark, a former crewman of the 'Lady Inger'
- v. Donnie Neil Sinclair, a salmon farmer with the Scottish Salmon Company
- vi. Calum Gilbert, a shellfish diver from Tarbert
- vii. Alan Hutchison, master of the Special Purpose Ship 'Northern River'
- viii. Piers Thomas Barker, a retired Royal Navy commander and defence contractor
- ix. Norman Bridges, a senior manager at HM Coastguard
- x. Euan Guthrie Ferguson, managing director of Ardmaleish Boat Building Limited
- xi. Calum Miller Ferguson, Euan's brother and a foreman at the Ardmaleish yard
- xii. David McAllister, naval architect and marine surveyor with S.C. McAllister & Co.
- xiii. John Alexander Williamson MacDougall, owner and former skipper of the *Nancy Glen* and father of the deceased Duncan MacDougall

- xiv. William Burns MacDougall, owner and former skipper of the *Nancy Glen* and uncle of the deceased Duncan MacDougall
- xv. Kenneth Ian McNab, fisherman and former chairman of the Clyde Fishermen's Association
- xvi. Adrian Scales, a director with Brookes Bell marine consultants
- xvii. Adam Nutt, a marine surveyor with the Maritime & Coastguard Agency
- xviii. William Forsyth, a marine surveyor with the MCA
- xix. Iain Kenneth Macleod, consultant naval architect
- xx. Nicholas Hance, Marine Accident Investigation Branch (MAIB) inspector
- xxi. David Steven Bruce Fenner, Fishing Safety Team Leader at the MCA Technical Standards Team
- xxii. Allan Madison Stuart, consultant naval architect

[4] In these proceedings the Crown was represented by Mr David Glancy OBE, Procurator Fiscal Depute. The Maritime & Coastguard Agency (MCA) was represented by Mr Peter Gray QC. The MacDougall family was represented by Mr Barry Smith QC. Przemyslaw Krawczyk's widow, Mrs Malgorzata Krawczyk, was not legally represented at the Inquiry, but gave evidence and thereafter attended each day of the proceedings, as did Mrs Dawn MacDougall, the widow of Duncan MacDougall. I am grateful to all representatives for the assistance offered throughout proceedings.

The legal framework

[5] The law governing this inquiry is set out in section 1 of the Act and in the Act of Sederunt (Fatal Accident Inquiry Rules) 2017. The purpose of this inquiry is to establish the circumstances of the deaths, and to consider what steps, if any, might be taken to prevent other deaths in similar circumstances. Inquiries of this kind are of a different nature to other forms of court proceedings. A fatal accident inquiry is not a trial; it is not an exercise in establishing criminal or civil liability. Its purpose is not to apportion blame or find fault. It is an inquisitorial process, the purpose of which is to establish facts. In deciding whether facts have been established, the court uses the same 'balance of probability' standard of proof as is used in civil trials. The public interest is represented by the Crown. In terms of section 26(1)(a) and section 26(2) of the Act, the sheriff's determination must set out findings made on:

- (a) when and where the death occurred,
- (b) when and where any accident resulting in the death occurred,
- (c) the cause or causes of the death,
- (d) the cause or causes of any accident resulting in the death,
- (e) any precautions which—
 - (i) could reasonably have been taken, and
 - (ii) had they been taken, might realistically have resulted in the death, or any accident resulting in the death, being avoided,
- (f) any defects in any system of working which contributed to the death or any accident resulting in the death,

(g) any other facts which are relevant to the circumstances of the death.

[6] In terms of section 26(1)(b) and section 26(4) of the Act the sheriff must make such recommendations, if any, as are considered appropriate regarding any of the following matters which might realistically prevent other deaths in similar circumstances;

- (a) the taking of reasonable precautions,
- (b) the making of improvements to any system of working,
- (c) the introduction of a system of working, and
- (d) the taking of any other steps.

[7] As a result of section 2(3) of the Act, the holding of this inquiry was mandatory, because the deaths of Mr Krawczyk and Mr MacDougall¹ resulted from an accident which took place in Scotland, and which occurred while both men were acting in the course of their occupation.

Summary

[8] There was little if any dispute about the facts relating to this accident. Instead, the main question that arose was how those facts were to be interpreted; specifically with regard to how various alterations to the vessel had affected its stability. This Summary is divided into the following sections.

1. The *Nancy Glen* and her crew

¹ Any reference in this Determination to “Mr MacDougall” relates to the deceased, Duncan MacDougall. His father and uncle will be referred to by their full names.

2. Stability and the regulatory framework
3. Modifications made to the vessel
4. The events of Thursday 18 January 2018
5. Recovery of the vessel and further investigations
6. Parties' submissions
7. Discussion and Conclusions
8. Final Observations

The Nancy Glen and her crew

[9] The *Nancy Glen* was built in 1991 and was originally named 'La Hai Roi' until 1995, when it was purchased by John and William MacDougall, members of a family which has fished off the east coast of Kintyre for generations. On buying the vessel they renamed it the *Nancy Glen*, thus making it the fourth vessel of that name to be sailed by their family.

Description

[10] The *Nancy Glen* was a twin-rig prawn trawler constructed entirely out of steel, with a registered length of 11.98 metres. Beneath its main deck there was a fish hold, accessed by a hatch on the main deck. The steering gear compartment was aft of the fish hold and the engine room was forward of it. The engine room was accessed by ladder from a compartment on the main deck. Underneath these three compartments there was a channel containing the propeller shaft and beneath that, the bilge. When constructed,

the floor of the fish hold was concrete, which also served as ballast for the vessel.

Beyond the engine room was the forepeak, which could be filled with fresh water for drinking or seawater to act as ballast.

[11] The wheelhouse was at the forward end of the main deck, from which it could be accessed via a short companionway. A four-berth cabin accommodation was above the engine room; its sole access was via the wheelhouse through a door and companionway on the port side.

[12] On the main deck behind the wheelhouse there was a three-drum winch for the trawl warps. There were two winch drums at the stern of the vessel, one for each net. In winter an intermediate bulk container (IBC) tank was kept aft of the winch and forward of the net drums, to be used for storing live catch in water.

[13] Above the main deck was the shelter deck, which had a crane at its aft end, on the port side, that was used for moving nets and catch when the vessel was in harbour. On either side of the shelter deck there was an aluminium tank used for holding live catch in water when the IBC tank on the deck below was full. Also on the port side of the shelter deck there was an aluminium A-frame used for lifting the nets on to the deck. On top of the wheelhouse roof there was an aluminium communication/navigation mast.

Operation

[14] The vessel was used solely for prawn trawling, with a 'twin rig' of two identical nets towed alongside each other behind the vessel. Each net was shaped roughly like a

triangle, wide at one end and then tapering to a narrow 'cod end' where the catch would be secured. These nets were used for 'demersal' trawling², in which the net skims along the seafloor where the prawns have their burrows. Only the front mouth of the net was on the seabed; the rest of the net, known as the 'headline', floated higher up in the water. Along the bottom of the net there were black rubber discs called 'hoppers' which would bump along the seabed, intended to prevent the net from digging into the mud.

[15] In between the two nets there was a weight composed of chain, known as a 'clump', whose purpose was to keep the net on the sea bed. On the outer edge of each net there were wires, known as 'sweeps' or 'bridles', connecting the net to a 'trawl door' at the outboard of each net. Each trawl door was made of steel and weighed a tonne and a half. When water was pushed against these doors it helped to keep the mouths of the nets open. Three wires, or 'warps' ran from the doors and the clump to the boat, where they were attached to a curved trawl bar (described in evidence as the "banana" bar) on the shelter deck. When the wires were out about 100 fathoms, chains would be put round each wire on a roller on the banana bar, to ensure that the warps between the winch and the bar remained slack, keeping all tension in the warps between the bar and the fishing gear. The roller allowed the chains to move to the side when the vessel was turning. As a result, if the vessel turned whilst trawling it would heel to the side that it was turning to, due to the force from the trawl gear being applied at that side of the banana bar.

² This is in contrast to 'pelagic' trawling, where the nets are in the water column between the surface and the seafloor.

[16] Legal restrictions prevented fishing on Saturdays and Sundays; but at midnight on a Sunday the *Nancy Glen* would head out to its fishing grounds, generally in the lower part of Loch Fyne or further south. In summer the boat would commonly be out for a couple of days at a time; in winter it would generally come home at the end of each day. On a Friday afternoon it would refuel to the maximum capacity of its tanks, a total of five thousand litres; on a typical trip 250 to 300 litres of diesel a day would be used. In summertime the catch was stored on ice in boxes in the fish hold; in winter live catch was kept in the large IBC tank filled with water on the main deck. The two smaller aluminium tanks filled with water on the shelter deck were used for any overspill catch.

[17] The boat would do three or four trawls a day, each trawl lasting three hours or so. It was common for the vessel's nets to snag on some object on the seabed, which would be indicated by the boat leaning over or jerking; in the words of John Miller, "like a fishing rod in your hands". A jerk would mean the burying or "muddying" of nets, that is to say that they had become embedded in the mud on the seafloor. When a net snagged the boat would be stopped, with the engine put in neutral, and the winch sometimes used to free the gear. Another option would be to go astern. If the nets were stuck fast it might be necessary to cut them loose; this happened to the *Nancy Glen* more than once. When that happened the vessel might go back into port and get a 'creeper', a long bar with hooks on it to trawl for the nets; alternatively divers might be used to recover the nets. Snagging and "muddying" of nets or trawl doors happened to all trawlers, but more commonly to the *Nancy Glen* because it had a practice of fishing in areas where other boats would not, areas with hazards such as wrecks, wartime debris

or even mines, where the crew relied on their experience and skill to keep the vessel safe.

[18] In 2017 there were three specific instances of snagging prior to the accident. In the early part of that year a quantity of mud and weeds was caught in the cod end, and a diver had to remove the debris. On a subsequent occasion a tree was caught in one net when it was being lifted; a feed barge helped to lift this out. On the third occasion, nets became snagged on a submerged wreck and the nets had to be cut free.

Crew

[19] At the time of the accident the *Nancy Glen* had a crew of three, namely the skipper, Duncan MacDougall, Przymeslaw Krawczyk, and John Miller.

[20] Duncan MacDougall was 46 at the time of the accident. He was married and had two children. He had been skipper of the *Nancy Glen* since January 2017, when he had taken over from his uncle William MacDougall (who in turn had taken over in 2003 from Duncan MacDougall's father John MacDougall³, skipper between 1995 and 2003).

Duncan MacDougall began working as a fisherman when he left school and was an experienced fisherman and skipper. He had completed the five mandatory Sea Fish

³ At the same time John MacDougall transferred 31 of his 32 shares in the boat to his son Duncan MacDougall, with his brother William MacDougall having the other 32. This ownership structure continued until the loss of the vessel in 2018.

Industry Authority ('Seafish')⁴ safety training courses⁵ which entitled him to act as skipper. Stability awareness training was not mandatory and there is no record of him having undertaken any such training.

[21] Przymeslaw Krawczyk (known as "Przemek") was 38 at the time of the accident. He too was married with two children. Mr Krawczyk was the son of a fisherman; all of the men on that side of his family were fishermen. After undergoing national service in the Polish navy he successfully studied for and obtained the requisite certificates that would allow him to work as a fisherman. After some time working in Ireland he was attracted by the better prospects offered by work in Scotland, and moved to Tarbert where he was eventually joined by his wife and children. In Scotland he had completed safety awareness and risk assessment training. From 2008 to 2017 he worked out of Tarbert on a number of boats, becoming skipper of the 'Scotia Star'. In January 2017 he began working as a crewman on the *Nancy Glen*.

[22] John Andrew Miller was 37 at the time of giving evidence. He had completed the mandatory Seafish courses in firefighting, first aid, 'sea survival' and safety awareness. Like Duncan MacDougall he had worked full-time on the *Nancy Glen* since leaving school, having previously worked on it part-time as a schoolboy.

⁴ Seafish is a non-departmental public body which supports the seafood industry. It delivers stability training, free of charge, for fishermen at 'new entry', 'experienced' and 'advanced' levels. These courses were and remain voluntary. Completion of stability training was a pre-requisite for award of the Seafish under-16.5m skipper's certificate, but this certificate too is voluntary and there was no requirement to hold it in order to act as skipper.

⁵ Survival, First Aid, Firefighting, Health and Safety, and Safety Awareness.

Stability and the regulatory framework

[23] A vessel's stability may be defined as its ability to return to the upright after being disturbed by an external force. When a vessel floats at equilibrium, its entire weight (also known as its "displacement") acts vertically downwards through the overall centre of gravity, 'G'. At the same time, the total buoyancy force acts vertically upwards through the centre of buoyancy of the underwater part of the hull, 'B'. The weight and the buoyancy force are of equal magnitude. When the vessel is upright, a vertical line can be imagined running through the centre of the vessel, with 'G' on that line directly above 'B'.

[24] That vertical line can be followed straight down to the bottom of the vessel to a notional reference point at the upper side of the keel plate, 'K'. The distance between 'K' and 'G' is the vertical distance of the centre of gravity, sometimes referred to as 'KG' or the Vertical Centre of Gravity ('VCG'). The distance between 'K' and 'B' is sometimes referred to as 'KB' or the Vertical Centre of Buoyancy ('VCB').

[25] When the vessel is tipped or 'heeled' to an angle, this causes 'G' and 'B' to no longer be vertically in line, because the position of 'B' moves due to the change in geometry of the underwater shape of the hull. If one drew a horizontal line from 'G' parallel to the waterline, it would intersect with a vertical line drawn through 'B' at a new reference point, 'Z'. The horizontal distance between 'G' and 'Z' is referred to as the 'righting lever' or 'GZ'. Because the two forces of weight and buoyancy continue to act vertically, but are now separated transversely, a 'moment' is created by the lever arm

'GZ' and the upwards force of the buoyancy; and this moment acts to restore the vessel to the upright position.

[26] If one drew a vertical line from 'B', showing the new line of buoyancy force, the point at which this new line intersected the vessel's centre line would provide another reference point, 'M', showing the vessel's transverse metacentre. The distance between 'G' and 'M' is known as the vessel's 'metacentric height' or 'GM'. This is used as a parameter to define initial stability and is valid for small angles of heel.

[27] The 'righting moment' of the vessel is given by its weight (equal to the buoyancy force) multiplied by the righting lever 'GZ'. If the vessel is to remain in equilibrium at a heel angle, the righting moment must be equal to the heeling moment. The maximum heeling moment that a vessel can withstand is equal to the maximum righting moment available.

[28] As the heel angle increases, the position of 'B' moves closer to 'G', thus reducing the righting lever 'GZ'. Once 'G' and 'B' are again vertically in line, the righting lever 'GZ' becomes zero, a point known as the 'vanishing angle of stability'. If 'B' continues to move away from 'G', the righting lever 'GZ' becomes negative, which results in a negative righting moment - also described as a 'capsizing moment'.

[29] The variations of righting lever with heel angle - from equilibrium, to small, maximum, reduced, zero and negative righting moment - can be portrayed on a graph, in the form of a 'GZ curve'. The vertical axis represents the righting lever and the horizontal axis represents the angle of heel in degrees. This curve shows that the

righting lever increases along with increasing heel angle until it reaches its maximum, after which it begins reducing as heel angle continues to increase.

[30] Stability criteria based on the 'GZ' curve's properties are used by regulatory bodies to ensure that vessels have adequate stability to operate at sea.

"Stability criteria are principally concerned with the enclosed area between the GZ curve and the horizontal axis, with minimum limits stipulated to ensure the stability is at an acceptable level. The heel angle at which the maximum GZ occurs is important as is the maximum value of GZ itself. The higher the angle that maximum GZ occurs at, the further a ship can heel or roll before stability starts to reduce. A higher value of GZ means a higher heeling moment can be withstood. A greater area under the GZ curve indicates greater stability, conversely a smaller area under the GZ curve indicates poorer stability."⁶

[31] Stability criteria for UK fishing vessels were introduced by the Fishing Vessels (Safety Provisions) Rules 1975. For the purposes of this Inquiry the most relevant rule was Rule 16, "Stability", which provides as follows:

"16. Every vessel of 12 metres in length and over to which these Rules apply shall in all operating conditions and circumstances set out in paragraphs 10 and 11 of Schedule 3 to these Rules and in all foreseeable operating conditions satisfy the following stability criteria after due correction for the free surface effects of liquids in tanks:—

- (a) the area under the curve of righting levers (GZ curve) shall not be less than:—
 - (i) 0.055 metre-radians up to an angle of 30 degrees;
 - (ii) 0.090 metre-radians up to an angle of 40 degrees or such lesser angle of heel at which the lower edges of any openings in the hull, superstructures, deckhouses or companionways, being openings which cannot be closed weathertight, are immersed;
 - (iii) 0.030 metre-radians between the angles of heel of 30 degrees and 40 degrees or such lesser angle as defined in (ii) above;

⁶ Report by Allan Stuart, naval architect, 6 April 2021, Appendix D, paragraph 3.5.

- (b) the righting lever (GZ) shall be at least 0.20 metres at an angle of heel equal to or greater than 30 degrees;
- (c) the maximum righting lever (GZ) shall occur at an angle of heel not less than 25 degrees;
- (d) in the upright position the transverse metacentric height (GM) shall not be less than 0.35 metres;

provided that, for vessels engaged on single or twin boom fishing the values of dynamic stability, righting lever and metacentric height given in sub-paragraphs (a), (b) and (d) respectively of this Rule shall be increased by 20%.”

[32] It will be noted that these stability requirements did not apply to vessels under 12⁷ metres in length. The development of regulations and guidance relating to the stability of fishing vessels is set out in the report⁸ of the Marine Accident Investigation Branch (MAIB) at part 1.8. For the purposes of this Inquiry it suffices to say that at no point between the construction and sinking of the *Nancy Glen* were these (or indeed any) stability requirements ever applied to vessels under 12 metres in length.

[33] Consequently the *Nancy Glen*, with a registered length of 11.98 metres, was never subject to any mandatory stability requirements.⁹

⁷ In 2002 an amendment was made whereby “all previous references to under 12m registered length will now read under 15m length overall” – MAIB report, Part 1.10.1.

⁸ “Report on the investigation of the capsizing and foundering of the fishing vessel *Nancy Glen* (TT100) with the loss of two lives, Lower Loch Fyne, Scotland 18 January 2018”, Report 6/2019, May 2019 – available online: <https://www.gov.uk/maib-reports/capsize-and-sinking-of-prawn-trawler-nancy-glen-with-loss-of-2-lives>

⁹ For completeness, in Merchant Shipping Notice MSN 1871 (F), “The Code of Practice for the Safety of Small Fishing Vessels of Less Than 15m Length Overall”, published in October 2017, the MCA “strongly recommended” that the owners and skippers of new vessels under 12m in length “should apply the stability criteria set out in this Code for vessels of 12m and above”. Those criteria, set out at section 3.34, are identical to the Rule 16 criteria described above.

Modifications to the vessel

[34] In April 2002 John MacDougall wished to make certain modifications to the vessel including installing a new net drum, winch, and crane, as well as extending the shelter deck on the boat's port side. He consulted David McAllister, a naval architect and marine surveyor with the firm of S.C. McAllister & Co. Before assessing the feasibility of the works, Mr McAllister required to establish the vessel's metacentric height to measure its stability. The *Nancy Glen* did not have a stability book or a full set of hull drawings, and had not previously undergone a stability test. Therefore Mr McAllister first conducted an inclining test, then compared the results with stability data from another similar vessel, the 'Aeolus'. As a result he obtained a probable metacentric height of 0.366 metres. In a letter to John MacDougall dated 30 April 2002 he noted that this exceeded the minimum metacentric height recommended by Rule 16 of the 1975 Fishing Vessel Safety Rules for Vessels over 12 metres, which was 0.35 metres. The effect of the proposed modifications would be to reduce the metacentric height to around 0.35 metres; as he described it, "on the limit". Consequently he advised that the modifications could be proceeded with "but top weight should be kept to an absolute minimum".

[35] Like many fishing boats, the *Nancy Glen* had poured-concrete 'floors' in its hold which also acted as ballast for the vessel. In 2002, two or three months after the modifications described above, a quantity of this concrete ballast was removed from the floor of the aft end of the fish hold by John MacDougall and either one or two other men. The reason for this was that John MacDougall had noticed that, following the recent modifications, the vessel's white 'boot-topping' line – where the vessel's normal paint

met its anti-fouling paint - was low in the water, and a lot more water was coming over the transom. John MacDougall testified that six baskets of concrete was removed, commenting that each basket could hold 18kg of prawns. In his witness statement he estimated that about two-thirds of the concrete ballast in the hold was removed at this time, causing a slight list to port that was compensated for by "alternating between the two fuel tanks". William MacDougall also spoke to the concrete removed in 2002 amounting to two-thirds of the ballast in the hold. After this concrete was removed, the top of the white line came back up to the waterline.

[36] John MacDougall gave evidence that no professional advice was sought regarding this removal of ballast. His brother William MacDougall suggested that Mr McAllister had recommended that ballast be removed, although he later qualified this, saying "I'd say David McAllister was consulted". David McAllister's evidence was that he did not recommend the removal of ballast from the *Nancy Glen*; to do so would require full knowledge of the vessel's stability, which he did not possess. The removal of the ballast was handled by John MacDougall, assisted by others, not by William MacDougall, and I consider that the latter has made an incorrect assumption rather than speaking from personal knowledge. I accept the evidence of John MacDougall that no advice was taken at the time of removing the ballast.

[37] After the various modifications in 2002 the vessel was not subjected to an incline test, but was taken out for a trial voyage in challenging weather, in which her performance was considered to be highly satisfactory.

[38] Each October for many years the *Nancy Glen* would go into the Ardmaleish yard on Bute for annual repair and refurbishment. In 2012 that yard fitted a 'Kort nozzle' to the vessel. A Kort nozzle is a sort of 'collar' fitted round the propeller which improves the latter's efficiency in the water, meaning that the vessel uses less fuel. This nozzle was made of steel and once fitted increased the weight of the vessel, but this was not considered to be a problem. As it was being attached to the bottom of the vessel, it was expected to improve stability. No surveyor or naval architect was formally consulted regarding this matter, although both John and William MacDougall spoke to there having been some discussions with a local naval architect, Andrew Peden, following which "we added steel to balance the boat up"¹⁰.

[39] In October 2013 the vessel's winch was replaced; little detail is available regarding the new winch but it was considered to be lighter and smaller than its predecessor.

[40] On 24 July 2015 the vessel was inspected by Adam Nutt, a principal surveyor with the MCA, in order for the vessel to have its safety certificate renewed. Its purpose was to confirm compliance with the Code of Practice for Small Fishing Vessels. The vessel's stability was not a subject of the inspection. Certain issues were identified which have no relevance for the purposes of this inquiry. On 4 December 2015 a new certificate was issued by the MCA, which would have been valid until 2020. The certificate noted that any unauthorised modification might invalidate it.

¹⁰ Evidence of William MacDougall, 11 May 2021.

[41] In 2016 Mr McAllister was asked to investigate the feasibility of raising the wheelhouse roof, but this project was not pursued.

[42] In November 2016 the Ardmaleish yard billed for 19 hours of work involved in breaking up and removing concrete ballast from the fish hold. After this John Miller¹¹ was instructed to use a jackhammer to remove further concrete ballast in order to tidy up the work done by the yard. Again, no surveyor or naval architect was consulted regarding the removal (or replacement) of the concrete. This removal of ballast was done on the instructions of Duncan MacDougall, and was opposed by his father John; they had a heated argument on the subject.

[43] In April 2017 the steel mast was replaced with an aluminium mast, the wheelhouse floor was replaced, and fabricated steel trunking was installed throughout the shelter deck for wiring. In May 2017 an aluminium derrick and base with an estimated maximum total weight of 50kg replaced a heavier steel derrick. In September 2017 an aluminium live catch tank was cut in half to form two smaller live catch tanks, which were then placed on the port and starboard sides of the shelter deck. In October 2017 a steel roller was replaced, as was "rotten" steel on the starboard side of the wheelhouse.

[44] In December 2017 a 14-foot long aluminium "A" frame was installed to replace a steel pole (used to lift the cod-end) and supporting structure. Also in December 2017, the 'Guerra' crane installed in 2002 was replaced by a new 'Thistlelift' crane with

¹¹ Mr Miller's evidence suggested that this took place in October 2017, and that it was intended to compensate for the weight about to be added by the new crane. However the invoices from the boatyard show only one episode of ballast removal by them, and on the balance of probabilities it seems more likely than not that this is the episode Mr Miller was referring to, and that he has simply mistaken the dates.

power-block. Where the Guerra crane had weighed 690kg, the Thistlelift replacement with its power-block weighed 1,450 kg. The replacement crane, like its predecessor, was located at the aft end of the shelter deck, on the port side.

The events of Thursday 18 January 2018

[45] At around 1800 hours on Thursday 18 January 2018 the *Nancy Glen* had been trawling for about six hours and was due to go back in to port. This was the vessel's second week of operating following the December modifications. John Miller thought that the boat now felt different. When turning it had always heeled over in the direction of the turn, but it now seemed to heel over more than previously. Mr Krawczyk asked Mr Miller "if it was meant to roll about like this", commenting that his last boat had not been like that. Mr Miller told him the vessel was always "a bit rolly".

[46] The fishing had been good that week¹² and on this day the crew had hauled their nets three or four times. The catch was washed and kept in the IBC tank on the main deck and also in both overspill tanks on the shelter deck. The weather was calm and still, frosty, with no rain but flutters of snow and hailstones. There was a very light northwesterly wind.

[47] Duncan MacDougall was at the helm in the wheelhouse. Mr Miller and Mr Krawczyk were sitting in the accommodation section. The boat started to 'stick' and judder, then go forward and stick again. This was a common occurrence and at first the

¹² William MacDougall's statement at paragraph 3.17 notes that he thought that Duncan MacDougall called that day to say the fishing was "a lot poorer", but on this point I prefer the primary evidence of John Miller.

crew did not worry, considering it to be caused by the nets 'bumping' into the mud. As had sometimes happened in the past, the fridge door fell open. Mr Miller took hold of it, expecting the boat to steady. He heard Duncan MacDougall say that "something was wrong", and could tell by the tone of his voice that it was serious. Mr Miller could feel the boat heeling; he threw himself to the floor and crawled up to the wheelhouse. He did not look back as he did so, and never saw Mr Krawczyk again.

[48] In the wheelhouse, Duncan MacDougall was holding on to the wheel and trying to use the throttle to clear the net. The boat was "right over"; Mr Miller had not experienced such an angle before, not as much as that. There was water on the starboard side of the deck, midway up the coaming of the hold hatch. Mr Miller went aft, to the port side of the winch. He was unable to stand upright and held on to the table used for sorting the catch as well as a rope hanging from the tripod. The IBC tank of water broke through the wooden boards holding it in place and slid across the deck, hitting the starboard side of the boat. Mr Miller got on to the outer flange of the port net drum, which due to the angle at which the boat was heeling was now effectively flat. He saw Duncan MacDougall still in the wheelhouse, closing its door from the inside.

Mr Miller then jumped off the stern into the sea. Once in the water he began swimming round the now-capsized boat, and thought he could hear voices speaking or shouting inside.

[49] Immediately prior to the capsize of the *Nancy Glen*, the Scottish Salmon Company's flatboat the 'Lady Inger', captained by Walter Paul MacIntosh and crewed by James Clark and Fergus Tinney, was sailing across the loch in a south-westerly

direction as the *Nancy Glen* headed north-east. Mr MacIntosh's attention was drawn to the *Nancy Glen* as it approached them because its starboard light was dipped lower than the port, indicating that it was going to turn right round.

[50] As the two vessels passed each other Mr MacIntosh noted that the *Nancy Glen* was "well heeled-over". He heard Fergus Tinney say "she's going over"; he turned and saw that the *Nancy Glen* had "flipped right over [...] as if it had vanished, just a black object in the water". He turned his own vessel back and turned all its lights on to the upturned boat, lying flat in the water with its bow pointing east towards Portavadie. They could hear shouting from the far side of the hull and identified the figure of John Miller in the water. They got him aboard using a boathook. He was in a state of shock, but was able to tell them that Mr MacDougall and Mr Krawczyk were trapped on board.

[51] Mr MacIntosh pressed the digital selective calling ("DSC") button to send out a distress call with the exact location co-ordinates. This was picked up by the Belfast Coastguard, which covers this sector of coastline. Mr MacIntosh told them what had happened. Initially his vessel was the only one on the scene, keeping its searchlight on the hull of the *Nancy Glen*. Then the Tarbert-Portavadie Calmac ferry MV 'Loch Riddon' arrived, followed by about seven other fishing vessels, the Campbeltown lifeboat and the Tighnabruaich inshore lifeboat. Another flatboat arrived and took John Miller to Tarbert.

[52] The Coastguard were first alerted to the accident by a '999' call from a member of the public at 1759 hours. Shortly thereafter the DSC alarm from the 'Lady Inger' was

received. Within five minutes the Tignabruaich lifeboat had been turned out, followed by other resources including the Rescue 199 helicopter from Prestwick, as well as nearby vessels which offered their assistance. Of necessity, control of the ongoing situation was devolved to the masters of vessels on the scene, subject to ongoing Coastguard monitoring.

[53] Two employees of the Scottish Salmon Company, Donnie Neil Sinclair and Alastair Sim went out to the 'Lady Inger' using a rigid inflatable boat, or 'rib'. When they arrived the *Nancy Glen's* hull was still level in the water. The propeller was still visible and Mr Sinclair attached a line to it, which was then attached to the ferry 'Loch Riddon'. He also used a metal shackle to strike the stern and could hear the hull being struck in response, as well as at least one voice from inside the vessel, although he could not make out what was being said.

[54] Mr Sinclair's vessel then returned to Tarbert to uplift a diver, Calum Gilbert, who had offered to help. The trip there and back took around fifteen minutes. By this time the *Nancy Glen* was no longer level but instead was almost vertical, her stern down in the water and only a small section of the bow, perhaps a metre and a half, visible above the surface.

[55] Calum Gilbert dived below the surface, going down as far as the *Nancy Glen's* stern, and inspected the exterior of the vessel using a torch. The vessel's nets were still attached; no-one was in the wheelhouse but an air pocket was apparent there due to items floating inside. Mr Gilbert could not hear any sounds coming from the vessel. He

tied a rope to the base of the *Nancy Glen*'s crane and took it to the ferry. After about ten minutes he surfaced and came back on to a nearby diving vessel, the 'Big Blue'.

[56] By this time another vessel, the 'Northern River' had arrived at the scene. It was a 'Special Purpose Ship' operated by Serco Marine Services on behalf of the Ministry of Defence, which used it to support the Royal Navy. It had been conducting tests north of Arran using Remote Operating Underwater Vehicles (ROVs) in support of the NATO submarine rescue system, before being requested by the Coastguard to attend the scene. With a tonnage of 2,600 tonnes and 91 metres in length, it was the largest vessel to attend. It was also equipped with three cranes, lifting straps and shackles.

[57] It was decided to attach the *Nancy Glen* to the 'Northern River' using straps. The intention was that the latter vessel could then use its crane to support the trawler pending the arrival of the Royal Navy's Northern Diving Group, who by this point had been alerted and were on their way. Mr Gilbert took straps and some shackles back into the water, and attached them to the cleats and railings at the bow of the *Nancy Glen*, which was by now completely underwater and still in a vertical position. This process took around five to ten minutes.

[58] Mr Gilbert passed the straps to a 'rib' in order for them to be taken to the 'Northern River'. However while Mr Gilbert was still in the water, about twenty metres from the *Nancy Glen*, it suddenly began sinking to the seabed. The rope attaching it to the ferry snapped, and a second rope connecting it to another vessel had to be cut to prevent that vessel being itself dragged underwater.

[59] Based on communications between vessels present, this final sinking can be timed at around 2033 hours. Thereafter, operations shifted to focus on search and rescue, in case any survivors could be identified in the water. Once survival ceased to be a realistic prospect the focus changed again, this time to search and recovery. The location of the wreck was marked using an ROV from the 'Northern River'.

Recovery of the vessel and further investigations

[60] The vessel was located using another ROV at a depth of 145 metres, sitting upright on the seabed, up to its waterline in mud. All of its fishing gear was still attached. Around half of the starboard net, but not its trawl door, was buried in the mud of the seafloor. The port net, in contrast, could be seen floating above the seafloor.

[61] On 13 April 2018 the vessel was lifted from the seabed by Keynvor Morlift Ltd ("KML"), who had been contracted by the Scottish Government for this purpose. It was initially taken to Portavadie; there the remains of Mr Krawczyk and Mr MacDougall were recovered from the accommodation and engine room respectively. Post-mortem examinations were carried out on 14 April 2018 by Dr Marjorie Turner MB ChB FRCPATH DipFM and Dr Leigh Anne Deboys MB ChB FRCPATH DipFMS DMJ (Path), with the cause of death for both men being recorded as "unascertainable following fishing vessel sinking".

[62] The vessel was then taken by barge to DRB Marine boatyard at Rosneath. On 16 April 2018 an attempt was made to refloat the vessel, but it began listing to starboard and had to be supported again using slings, then lifted back on to the barge. Around a

tonne of weight was taken off and further attempts at refloating were made the next day and the day after that. To counteract the listing, around 500 to 750 kg of ballast was added to the hull. An inclining 'heel' test was then carried out by KML which determined the vessel's metacentric height (GM) to be 0.396 metres. A 'roll test' was then carried out by the MCA, which gave an indicated GM of 0.3033 metres, failing to meet the required GM of 0.6835 metres, results which were considered to be largely in line with those of the 'heel test' previously conducted by KML.

[63] The vessel was then taken ashore and kept on a hardstanding at Rosneath. In September 2018 it was laser-scanned by Solis Marine Consultants to reproduce its hull form, following which the General HydroStatics software package was used to make a hydrostatic model of the vessel. On 4 October 2018 Solis conducted a further inclining test, during which the vessel appeared quite 'tender', easily listing under the weight of people moving across the deck.

[64] The stability analysis conducted by Solis considered a number of different potential loading conditions for the vessel, and concluded that it had very poor stability in all of these conditions. It would have failed to meet the stability criteria set down by the Small Fishing Vessels Code (i.e. the Rule 16 criteria) in any of the loading conditions. Their report dated 12 December 2018 concluded that:

“the vessel had a very limited ability to withstand any induced heeling moment arising from wind and wave conditions or from the load applied on the trawl connections”.

[65] The report also concluded that the load on the banana bar required to capsize the vessel could have been as low as 1.8 to 2.3 tonnes.

[66] These findings were largely concurred with by the MAIB's report into the sinking¹³, which found that the *Nancy Glen* would not have satisfied the Rule 16 stability criteria for fishing vessels (albeit these criteria did not apply to the vessel because of its length), and that it was also unlikely that the vessel would have satisfied these criteria at the point at which it was built.

[67] This analysis found further support in a report on the causes of the accident commissioned by the Crown from Ian Macleod B.Sc (Hons) M.Phil (naval architecture) MRINA, a chartered engineer and naval architect who operates a marine consultancy business, I K Macleod & Associates.

[68] Mr Macleod commented that all vessels are built to come under some rule or another, the aim being to maximise a vessel's size whilst minimising the rules applicable to it. It was, however, common practice in the fishing industry to use the over-15 metre stability criteria as a benchmark for fishing vessels under 15 metres. Mr Macleod considered that this was prudent and professional when such a standard was available, even if there were no legal requirement to do so, and that this was particularly the case with fishing vessel stability, where the associated risk to human life was well known.

[69] Mr Macleod used 'Maxsurf' software, inputting data from the Solis scans, to independently model various loading conditions for the vessel, using the Rule 16 criteria as a benchmark. He found that:

“the stability of the *Nancy Glen* was poor, regardless of what stability criteria are used. The angle of maximum GZ, magnitude of maximum GZ, range of stability, area under the GZ curve etc are all very low.”¹⁴

¹³ Report 6/2019, May 2019 at 1.9.2.

¹⁴ Report dated 21 April 2021, Section 5.9.1.

[70] Mr Macleod's report went further than that provided by Solis in ascribing the cause of the vessel's poor stability to the modifications made to the vessel, particularly the final modifications made in December 2017, all of which had raised the vessel's centre of gravity, reduced the metacentric height and thus lessened the vessel's stability. He considered that the load on the trawl warps / banana bar required to cause capsize while trawling was probably somewhere between 2 and 2.5 tonnes. In contrast it would take four or five times that load, between 8 and 10 tonnes, to capsize a vessel compliant with Rule 16 requirements.

[71] In Mr Macleod's opinion, this incident should have been survivable. The reason that it was not was because the *Nancy Glen* had too high a centre of gravity and had insufficient stability. Indeed he considered that by the time of the accident stability was so poor that even normal operation of the vessel could have caused its capsize.

[72] Another analysis of the vessel's loss was presented by Allan Stuart B.Eng (Hons), C.Eng, MRINA. Mr Stuart is a chartered engineer and consultant naval architect with Waves Group and a member of the Lloyd's Special Casualty Representatives Panel. He has extensive experience of investigating shipping casualties, using a variety of specialist software for a wide range of vessel types. In September 2018 he was instructed on behalf of Sunderland Marine Insurance to examine and report on the circumstances of the loss.

[73] Mr Stuart used HECSALV naval architecture software¹⁵ to create a computer model of the vessel, based on the laser scan and inclining test carried out by Solis. He noted that the transverse bulkhead forming the aft end of the wheelhouse was, on the starboard side, stepped forward by about 1.4 m over a width of 1.25 m from the starboard side shell. As a result of this asymmetry, the vessel would have less buoyancy and therefore less stability when heeled to starboard at large angles of heel. Neither Solis nor Mr Macleod appeared to have taken account of this factor, and consequently both were likely to have over-estimated the stability of the vessel when heeled to starboard.

[74] His analysis considered two general scenarios, namely the condition of the vessel before December 2017 and its condition after the modifications conducted then. For each scenario five general conditions were analysed and a GZ curve was produced for each.¹⁶ He found that the modifications made in December 2017 had had a detrimental effect on the vessel's stability. The additional weight of the crane raised the overall vertical centre of gravity, as did the storage of catch in the IBC tank on the main deck aft of the hold. If the two storage tanks on the port and starboard sides of the shelter deck were used or filled with seawater then the stability of the vessel would again be considerably reduced.

¹⁵ Whilst three different types of software have been used for modelling purposes, the differences in the parameters produced have been small and considered to be within acceptable tolerances.

¹⁶ (1) "Depart Port"; (2) "Trawling condition, no catch on board"; (3) "Trawling condition, 200kg catch, top live tanks empty"; (4) "Trawling condition, 300kg catch, top live tanks empty"; (5) "Trawling condition, 300kg catch, top live tanks full [of] water";

[75] The December 2017 modifications raised the vertical centre of gravity by around 47mm, decreased the maximum righting lever or 'GZ' by around 20% and reduced the initial transverse metacentric height 'GMt' by around 15 to 16%. Stability at small angles of heel did not change significantly, so the reduction in stability may not have been noticeable to the crew when the vessel was operating in a normal condition.

[76] Mr Stuart sought to calculate the static heeling moment that had been imparted upon the vessel when its net became caught in the seafloor mud. The static force that would cause the vessel to capsize would be dependent on the time taken for the vessel to stop. As the vessel was turning at that point, the trawl warps would have moved to the starboard end of the banana bar, which is where the force from the trawl gear would be applied, at an angle to the centreline. On the basis of certain assumptions¹⁷ he calculated a range of heeling moments and maximum righting moments, applied to the configuration of the vessel both before and after the December 2017 modifications. The results showed that the static heeling force acting on the banana bar would be higher when the vessel's stopping time was lower. In only one instance – where the time taken to stop the vessel was 15 seconds, and the angle of the trawl warps to the centreline in the horizontal plane was 15 degrees – did the results show that without the December modifications the vessel would not have capsized.

¹⁷ These were: that the vessel was trawling with 300 kg of catch on board; the overspill tanks on the shelter deck being empty; the added mass being 10% of the vessel's displacement; the initial speed being 2.4 knots; the stopping time ranging between 15,30,45 and 60 seconds; and the angle ranging between 0,15,30 and 45 degrees.

[77] Mr Stuart concluded that the principal cause of the vessel's capsize and loss was the heeling moment applied to the vessel when its starboard net became embedded in the seafloor. Although the December 2017 modifications diminished the vessel's stability, he considered that that heeling moment would have overcome the vessel's stability even if these modifications had not been made.

[78] Unlike Mr Macleod and Solis, Mr Stuart did not compare results of the GZ curve parameters against any static stability criteria for vessels over 15 metres in length, because at the time of the vessel's loss, the static stability regulations applicable to such vessels did not apply to the *Nancy Glen* due to its lesser length. He considered that the vessel had been intentionally designed to be just under 12 metres in length in order to circumvent the stability requirements applicable to larger vessels; so it had never been intended to comply with these criteria. In his view therefore the stability criteria were "not directly relevant"¹⁸ although the *Nancy Glen's* stability could be characterised as "poor" if it were to be compared to these criteria¹⁹. Mr Stuart accepted that the Rule 16 criteria could legitimately be applied to vessels under 12 metres in length as a good benchmark of stability (indeed his software programme appeared to assess data against the Rule 16 criteria automatically). With regard to Mr Macleod's contention that had the vessel complied with the criteria, a force four times greater would have been required to capsize it, Mr Stuart could not agree or disagree with this; it was not something he had

¹⁸ Report of 6 April 2021, paragraphs 7.8 and 7.9.

¹⁹ Report of 6 April 2021, paragraph 7.27.

addressed in his reports. He accepted that if the vessel had had better stability, “the incident may not have occurred the way it did”²⁰.

Parties’ submissions

[79] There was unanimity among the parties with regard to the findings that the court ought to make in respect of section 26(2)(a), (b) and (c) of the Act, regarding when and where the deaths of Mr Krawczyk and Mr MacDougall had occurred; when and where the accident resulting in the deaths had occurred; and the cause of the deaths. The findings under these headings recorded at the beginning of this Determination reflect the wording suggested by the Crown and concurred with by the other parties.

Section 26(2)(d) of the Act – the cause or causes of the accident resulting in the deaths

[80] Clearly, the accident which resulted in the deaths of Mr Krawczyk and Mr MacDougall was the capsizing of the vessel shortly before 1800 hours on 18 January 2018, followed by its sinking at around 2033 hours.

[81] For the Crown, it was submitted that the cause of this accident was twofold. First there was the reduction in the vessel’s stability due to the various modifications made to it, especially those made between September 2016 and December 2017. Second there was the ‘muddying’ of the vessel’s trawl gear on the sea floor. Dealing first with the modifications, it was submitted that the removal of ballast in 2002 and 2016 had not

²⁰ Evidence of 1 July 2021, cross-examination by the Crown.

benefitted from the advice of a naval architect. The extent to which ballast was removed was unusual, and the area from which some had been removed was directly below the location of the vessel's crane. The replacement of the crane in late 2017, the replacement of the steel mast with an aluminium structure, and the replacement of the steel lifting pole for taking inboard the cod end with an aluminium A-frame had all been done without expert advice. All contributed to the vessel having poor stability with too high a centre of gravity. As for the 'muddying' of the net, it was a relatively common experience for trawlers and ought not, of itself, have caused the vessel to capsize. By January 2018, the vessel was "intrinsicly unstable".

[82] For the MacDougall family, it was submitted that this section of the Act was directed to the "operative cause of the accident", and not to "pre-existing conditions" such as the condition of the vessel – Hart & Honoré, *Causation in the Law* (2nd edn. pp.79-80); *McDonald v Smellie* (1903) 5 F. 955. In the present case, that "operative cause" was the starboard net becoming embedded in the sea floor. The evidence showed the MacDougalls to have been responsible owners who kept the vessel well maintained. With the benefit of hindsight, it was accepted that the various modifications made to the vessel, particularly those made in December 2017, had reduced its stability. Kenneth McNab's evidence showed that the degree of embedding was very unusual and would not have been immediately noticeable to the skipper, who would then have been faced with a sudden loss of the vessel's righting lever before any remedial action could be taken. Allan Stuart's consistent position had been that the principal cause of the

capsize and loss was this embedding of the net in the seafloor, and the court was invited to make a finding to that effect.

[83] For the MCA, no submission was made in respect of section 26(2)(d) of the Act regarding the cause or causes of the accident.

26(2)(e): Precautions which (i) could reasonably have been taken, and (ii) had they been taken, might realistically have resulted in the deaths, or any accident resulting in the deaths, being avoided

[84] For the Crown, it was submitted that such precautions would have been for the owners to have engaged a naval architect, marine surveyor or other competent person to determine the vessel's stability, before and/or after the completion of any modifications from 2002 onwards. Alternatively 'heel' or 'roll' tests as set out in Marine Guidance Note MGN 503 (F) should have been conducted to give an indication of the vessel's stability prior to any structural modifications. In particular, regard should have been had to the effect on stability of (a) the removal of ballast between 2002 and 2016, (b) the replacement of the cod end lifting arrangements and crane and power block in December 2017, and (c) the storage of catch in seawater in containers on the main and shelter decks of the vessel.

[85] For the MacDougall family it was accepted that with the benefit of hindsight, it would have been prudent to engage a professional person to assess the effect on stability of the removal of ballast (insofar as this was not done) and in respect of the other modifications made in December 2017. Consequently it would have been a reasonable

precaution, either when the ballast was removed or at the time of these other works, to have instructed an assessment of the effect of these changes on the vessel's stability.

[86] However, whilst this "might" have prevented the accident, it could not be said that it would have been likely to do so, given the opinion expressed by Allan Stuart that the heeling moment created by the starboard net becoming buried in the seafloor would have caused a capsize even if the modifications had not been made.

[87] For the MCA, it was submitted that in terms of section 26(2)(e) of the Act, there were no reasonable precautions that could have been taken by the MCA which could have prevented either the accident or the deaths which resulted from it.

26(2)(f): Defects in the system of working which contributed to the deaths or any accident resulting in the deaths

[88] For the Crown it was submitted that such a defect was constituted by the practice of not storing the catch in the fish hold. In addition to the IBC tank kept on the main deck forward of the net drums, two aluminium tanks had been placed on the port and starboard sides respectively of the shelter deck to be used in winter to store live catch. Citing the evidence of William Forsyth, the Crown submitted that the storage in winter of live catch, tubed and in water-filled tanks on the main and shelter decks "would result in an unusually large increase in the vessel's centre of gravity", adding as much as 1.2 tonnes of top weight in addition to the capacity of the IBC to hold one tonne of water. This was contrary to best practice which was to store any catch as low in a vessel as

possible, as set out in MGN 427(F) "Stability Guidance of Fishing Vessels of under 15 metres Length Overall".

[89] For the MacDougall family it was accepted that storing catch in tanks on the shelter deck was not in accordance with best practice, and had the effect of raising the vessel's vertical centre of gravity, which in turn would have had a detrimental effect on stability. Consequently it was possible that in so far as such storage contributed to the reduction in stability, then it may have contributed to the accident. The extent of this contribution was unquantifiable but was likely to have been "relatively insignificant".

[90] For the MCA it was submitted that there were no defects in the MCA's system of working which contributed to either the accident or the deaths which resulted from it.

26(2)(g): Other facts relevant to the circumstances of the deaths

[91] The Crown made two submissions under this section. First it was submitted that the absence in January 2018 of statutory stability requirements for all fishing vessels under 15 metres in length was relevant to the loss of the *Nancy Glen*. It was one of a class of vessels known as 'rule-beaters', constructed to evade the requirement to meet minimum stability criteria. Vessels of this size constituted the largest element of the national fishing fleet, and it was "odd" that there should be no stability requirement for them, particularly given that similar vessels used as workboats were subject to the same minimum stability requirements as set out in Rule 16 of the 1975 rules. A "lengthening

roll call” of fishing vessels of this size had foundered as a result of instability.²¹ The evidence of David Fenner showed that a revised version of the Small Fishing Vessel Code was soon to come into force²², and the court was invited to recommend that it be implemented.

[92] The second submission for the Crown related to stability awareness for masters of fishing vessels. The Crown noted that a course in stability awareness is offered by Seafish - and that it had been described as “useful” by Kenneth McNab, who had completed it - but that it was not a mandatory course. It was submitted that the snagging of the *Nancy Glen*’s fishing gear ought not to have caused the vessel to capsize; that it did so in this instance because the vessel’s stability had been compromised; and that this formed part of a wider pattern of losses of other fishing vessels, in which lack of stability was a major factor. Again under reference to the evidence of Mr Fenner it was submitted that the new Small Fishing Vessel Code proposed mandatory certification for skippers of vessels between 7 and 16 metres in length, including a module on stability. The court was invited to recommend that this proposal be implemented.

²¹ MAIB reports were lodged in respect of the losses of the following vessels: the ‘Catrina’ on 13 October 1998; the ‘Charisma’ on 30 January 2002, causing the death of crewman Mark Spiers; the ‘Kirsteen Anne’ on 31 December 2002, causing the deaths of two crewmen; the ‘Amber’ on 6 January 2003 causing the death of its skipper; the ‘Bounty’ on 23 May 2005; the ‘Ellie May’ on 12 August 2007, causing the death of its skipper; the ‘Aquila’ on 20 July 2009, causing the deaths of skipper Tony Hayton and crewmen Peter Hilton and Thomas Sanderson; the ‘Heather Anne’ on 20 December 2011, causing the death of crewman Ian Thomas; the ‘Stella Maris’ on 28 July 2014; and the ‘Solstice’ on 26 September 2017, causing the death of its owner, Tony Jones.

²² This Code imposes stability requirements for new decked vessels (and existing vessels which change their fishing method) of less than 12m registered length. For existing vessels, heel or roll tests are required to take place at five-yearly intervals. It also requires owners to inform the MCA of any proposed modification to the vessel; the MCA will consider whether any further investigation is needed before the changes are then made.

[93] For the MacDougall family it was noted that the MAIB had repeatedly recommended that better stability information should be provided to fishermen; and that the lack of clear stability criteria for new fishing vessels under 12 metres in overall length, and existing fishing vessels under 15 metres in overall length,

“put crews of small fishing vessels at considerable risk [...] Until such criteria have been derived and implemented it is likely that more vessels will be lost”²³.

[94] It was submitted that the current situation - where no mandatory minimum stability criteria applied to this class of vessel, but owners and fishermen were expected to understand and follow “recommended” criteria for vessels in a different class, even though they were not required to undergo stability training - placed them in “an invidious position”. If government regulators intended that minimum stability criteria should apply to small fishing vessels this should be made clear through legislation.

[95] On behalf of the MCA, the court was advised that the proposed stability requirements for fishing vessels with a registered length of less than 12 metres had come into force on 6 September 2021, and were now contained in the ‘Code of Practice for the Safety of Small Fishing Vessels of less than 15m Length Overall’. With regard to the other recommendation sought by the Crown, regarding stability awareness for masters of fishing vessels between 7 and 16 metres in length, the making of such a recommendation was not opposed by the MCA.

²³ These quotations are taken from the MAIB’s report into this accident at p.32 (Part 2.8) and p.34, Part 3.1, para 5.

Discussion and conclusions

26(2)(d): *The cause or causes of any accident resulting in the deaths*

[96] I agree with the Crown's submission that the cause of the accident was twofold. The evidence makes clear that on the evening in question, as the *Nancy Glen* executed a turn to starboard whilst trawling, its starboard net became deeply embedded in the mud on the seafloor. This in turn produced a heeling moment that the vessel was not stable enough to withstand.

[97] The 'muddying' of the net alone cannot be given as either the sole or the principal cause of the accident. Nets and other forms of trawl gear are regularly 'muddied' or snagged on underwater obstacles. The degree to which this net was embedded in the seafloor was substantial; Mr Stuart, seeing the ROV footage, commented that the net would have acted almost like an anchor, imparting a large force on the vessel²⁴.

However he did not suggest that this would be any less true for other incidents of muddying or snagging, and it is not a factor that he dwells on at any length in his reports. If nets come fast on something, whether in the seafloor mud or on an obstacle, this would cause the same 'anchoring' effect and impart a force upon the vessel. The calculation of that force would depend not on the degree of embedding or entanglement but on the factors discussed at paragraph 76 above. In the vast majority of such cases the vessels involved do not capsize, because they have an adequate reserve of stability to withstand the heeling moment. The *Nancy Glen's* lack of such a reserve explains why in her case the

²⁴ Report of 6 April 2021, paragraph 6.7.

muddied gear led to her capsize. I agree with Mr Macleod that in assessing the stability of a vessel of the *Nancy Glen*'s size, it makes sense to use the statutory criteria that it would have been subject to had it been two centimetres longer. Applying those criteria it is clear that the *Nancy Glen*'s stability was poor. It is more likely than not that if the vessel had complied with the Rule 16 stability criteria then it would not have been lost.

[98] The vessel's lack of stability is therefore the second element of this accident's twofold cause. The actual modifications are more properly categorised as being the cause of that lack of stability. Having regard to the structure for Determinations which is set out by the Act, I consider that the role of the modifications should be considered under Section 26(2)(e) regarding reasonable precautions which might have avoided the accident.

26(2)(e): Precautions which (i) could reasonably have been taken, and (ii) had they been taken, might realistically have resulted in the deaths, or any accident resulting in the deaths being avoided

[99] There was common ground between the representatives of both the Crown and the vessel's owners that it would have been reasonable to take professional advice from a naval architect, marine surveyor or other competent person prior to, or following, (a) the occasions when ballast was removed, and also (b) the replacement of the crane and the cod-end lifting arrangements in December 2017.

[100] I agree that this is correct, especially with regard to the question of ballast.

Euan Ferguson of Ardmaleish boatyard gave evidence that it is not common to remove

concrete ballast from fishing vessels, but more common to move it within a vessel.

Mr Forsyth of the MCA testified that it was “very unusual” for concrete ballast to be removed in the amounts that were taken from the *Nancy Glen*. Taking professional advice in relation to such an unusual step was both an available and a suitable option.

[101] If this precaution had been taken, might it realistically have resulted in this fatal accident being avoided? In other words, was there a real or likely possibility, as opposed to a remote chance, that the precaution might have prevented the accident?

[102] The modifications in question unquestionably had a significant detrimental effect on the vessel’s stability. If professional advice had been taken at the time of the removals of ballast in 2002 and October 2016 - or at the time of the replacement of the crane and the cod-end lifting arrangements in December 2017 - I consider that there is a real possibility that either these modifications would not have taken place at all, or they would have been effected in a manner that did not produce the same detrimental effect on stability. This in turn leads to a real possibility that when on 18 January 2018 the vessel came to experience the heeling moment caused by its ‘muddied’ net, it would have had sufficient stability to remain upright.

[103] Mr Stuart’s analysis was that the vessel’s stability would have been overcome by the heeling moment whether or not the December 2017 modifications had been made. I found Mr Stuart to be an impressive witness, but I do not accept his factual hypothesis that the overspill tanks on the shelter deck were empty at the time of the accident.

[104] Instead I accept the evidence of John Miller that these tanks were filled with catch and water. More generally, I consider that the question for the court under this

Section is not limited to considering the December 2017 modifications in isolation. The question is not whether these modifications did or did not make capsizing inevitable; the question is what reasonable precautions might have prevented the accident. I am in no doubt that it would have been a reasonable precaution to take professional advice at the time when ballast was proposed to be removed in 2002 and in 2016²⁵. The evidence of Mr McAllister suggests that a naval architect would only advise on changes of ballast after properly investigating the vessel's stability. The taking of professional advice would therefore not only have addressed the issue of modifying ballast, but also provided the owners with greater insight into the vessel's stability generally. This in turn would have informed the modifications made at later dates.

26(2)(f): Defects in the system of working which contributed to the deaths or any accident resulting in the deaths

[105] William Forsyth of the MCA gave unchallenged evidence that catch ought to be stored as low down in the vessel as possible, in the fish-hold; and that to store it higher up on the main or shelter decks would raise the centre of gravity and thus lessen stability. This is supported by the terms of Allan Stuart's report of 21 April 2021 at paragraphs 4.13.3 and 4.13.4. Guidance to similar effect has been issued to the fishing

²⁵ The 2016 removal of ballast is not mentioned within Mr Stuart's detailed analysis of modifications made over time (section 5.5 of his report of 6 April 2021) which suggests that he was not made aware of it.

industry²⁶. It was therefore undeniably a defect in the system of working to store catch on deck.

[106] Did this defect contribute to the fatal accident? The accident was caused in large part by a lack of stability. Storing catch in tanks filled with water high up in the vessel decreased stability by raising the centre of gravity. I therefore consider that it contributed to the accident. The extent of its contribution cannot be exactly quantified, but on the basis of Mr Stuart's opinion mentioned above at paragraph 74, had these tanks been full the consequent reduction in stability would have been "considerable".

[107] Finally, I was advised that this practice of storing catch on deck was "the almost universal practice amongst small fishing vessels on the west coast". If this is true then it is a matter of considerable concern.

26(2)(g): Other facts relevant to the circumstances of the deaths

[108] The first matter raised by the Crown has to some extent been overtaken by the new Code of Practice which came into force on 6 September 2021. Notwithstanding this, it is relevant that at the time of the accident the *Nancy Glen* was not subject to any mandatory stability requirement. The criticisms of that situation made by both the Crown and on behalf of the MacDougall family have considerable merit.

[109] Turning to the second matter, stability awareness training for masters of fishing vessels, the court was advised that the MCA's Technical Standards Team is currently

²⁶ Marine Guidance Note 427(F), "Stability Guidance for Fishing Vessels of under 15m Overall Length", issued December 2010, paragraph 3.1: "It is also vital that the catch is not stored on deck, it should be stored as low as possible as soon as is practicable."

considering the introduction of a mandatory skipper's certificate which would include a module on stability. This proposal was expected to go out to consultation in March or April of 2022, and would hopefully come into force in autumn 2022. I recommend that this proposed mandatory requirement be implemented. Having regard to the other MAIB reports placed before the court by the Crown, I consider that the loss of the *Nancy Glen* should not be seen as an isolated incident, but rather as part of a wider pattern of small fishing vessels being lost in circumstances where inadequate stability plays a prominent role. The evidence before this inquiry showed the MacDougall family to be good employers who took pride in their vessel and kept it well-maintained. When making the various modifications described above to the *Nancy Glen*, they did not understand themselves to be placing the vessel in danger. They considered it to be a safe boat, an assessment which was based on how it felt to them. The evidence suggests that trusting to such subjective assessments rather than seeking professional advice is not unique to the MacDougalls, but is widespread within the fishing industry. As Allan Stuart put it towards the end of his evidence, "if you look at the fishing fleets, you will find many with similar stability to the *Nancy Glen*". The complexity of ensuring vessel stability, coupled with its enormous importance in keeping vessels and crews safe, requires that stability training be made mandatory for the skippers of such vessels.

Final observations

[110] Before concluding this Determination I think it is appropriate to recognise the courage and resourcefulness of those who attended the capsized vessel and made

impressive efforts to save the men inside; and also to recognise the compassion that was shown to the grieving families by so many people in this community, and beyond, in the days and weeks that followed. I would also commend John Miller for the assistance that he gave the Inquiry; reliving this terrible experience cannot have been easy for him.

[111] At the conclusion of the hearing I, along with the representatives of the parties, expressed my condolences to both of the bereaved families. I do so again now. To work as a fisherman in the arduous conditions of these waters requires a very great deal of both courage and fortitude, qualities possessed by both Przemyslaw Krawczyk and Duncan MacDougall, devoted family men whose loved ones feel an enormous sense of loss.