MCIB
Marine Casualty Investigation Board
Bord Imscrúdú Taismí Muirí

REPORT OF AN INVESTIGATION INTO A MARINE CASUALTY INVOLVING MULTIPLE ROWING VESSELS IN OR AROUND SALMON WEIR, RIVER CORRIB, CO. GALWAY 14 JANUARY 2023

REPORT NO. MCIB/325
(No.4 OF 2024)

The Marine Casualty Investigation Board (MCIB) examines and investigates all types of marine casualties to, or onboard, Irish registered vessels worldwide and other vessels in Irish territorial waters and inland waterways.

The MCIB objective in investigating a marine casualty is to determine its circumstances and its causes with a view to making recommendations to the Minister of Transport - for the avoidance of similar marine casualties in the future, thereby improving the safety of life at sea and inland waterways.

The MCIB is a non-prosecutorial body. We do not enforce laws or carry out prosecutions. It is not the purpose of an investigation carried out by the MCIB to apportion blame or fault.

The legislative framework for the operation of the MCIB, the reporting and investigating of marine casualties and the powers of MCIB investigators is set out in the Merchant Shipping (Investigation of Marine Casualties) Act, 2000.

In carrying out its functions the MCIB complies with the provisions of the International Maritime Organisation's Casualty Investigation Code and EU Directive 2009/18/EC governing the investigation of accidents in the maritime transport sector transposed into Irish law by the European Communities (Merchant Shipping) (Investigation of Accidents) Regulations 2011.

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The Marine Casualty Investigation Board was established on the 25th March 2003 under the Merchant Shipping (Investigation of Marine Casualties) Act, 2000.

Glossary of Abbreviations and Acronyms

AGS	An Garda Síochána
C	Celsius
CCTV	Closed Circuit TV
CGU	Coast Guard Unit
CoP	Code of Practice for the Safe Operation of Recreational Craft
GFRS	Galway Fire & Rescue Service
CRYC	Corrib Rowing and Yachting Club
IRCG	Irish Coast Guard
ISO	International Organisation for Standardisation
MCIB	Marine Casualty Investigation Board
MN	Marine Notice
MRSC	Marine Rescue Sub-Centre
NAS	National Ambulance Service
NEOC	National Emergency Operations Centre
PFD	Personal Flotation Device
RNLI	Royal National Lifeboat Institution
R118	Coast Guard Helicopter
S.I.	Statutory Instrument
SITREP	Situation Report
UTC	Co-ordinated Universal Time
VHF	Very High Frequency
Z	Zulu time (Universal Time Coordinated)

Hour	hr
Kilogram	kg
Kilometre	per hour km/h
Knot	kt
Litre	lt
Metres	m
NM	Nautical mile

Glossary of Rowing Terms

Cat	Catamaran. A type of engine-powered boat used by a rowing coach.
Coxswain	The person who steers a rowing boat.
Four	A rowing boat used in the sport of competitive rowing that contains four rowers, with or without a coxswain to steer the boat. Each rower propels the boat by sweeping with one oar, held in both hands.
Launch	A type of engine-powered boat used by a rowing coach.
Octuple	A rowing boat used in the sport of competitive rowing that contains eight rowers, and normally a coxswain to steer the boat. Each rower propels the boat by sculling with two oars, one in each hand.
Quadruple	A rowing boat used in the sport of competitive rowing that contains four rowers, with or without a coxswain to steer the boat. Each rower propels the boat by sculling with two oars, one in each hand.

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Report MCIB/325 published by the Marine Casualty Investigation Board.
17th April 2024.

1. SUMMARY

1.1 On the 14 January 2023, a scheduled training session on a river for two competitive rowing boats resulted in a marine casualty event that caused the loss of the two rowing boats and posed a threat of death or serious injury to persons who had been operating recreational vessels in Irish waters.

1.2 A complex system and an issue of risk normalisation – in which risky behaviour gradually becoming acceptable over time – had developed around rowing activities in the vicinity of the river's Salmon Weir, especially during the river's high flow rates and low water temperatures during winter months. This system was inherently sensitive to changes or omissions, even those that may not have been obvious to the persons charged with achieving the goal of a safe rowing activity. This sensitivity can be seen in the history of previous, similar incidents, in which the potential severity of the situation or the likelihood of a repeat outcome seems to have not been appreciated.

1.3 As a result, what may have initially appeared to be an innocuous meeting on the river of the rowing boats from two clubs – one setting out upriver and the other returning downriver – set in motion a final sequence of events that resulted in the loss of two rowing boats and posed a threat of death or serious injury to the crews of these two boats.

1.4 The University of Galway Boat Club experienced this marine casualty event because of a combination of the following causal factors:

a. Unsuitable weather conditions.

b. Unsuitable river conditions.

c. Inadequate trip planning.

d. Inadequate safety systems.

e. Unsuitable Rules of the River.

f. Unsuitable weir safety booms.

g. Unsuitable coach's boat.

1.5 Since this casualty event, many changes have been enacted in the operation of rowing activities in the University of Galway Boat Club. This rowing club is just one of eight that have been sharing this river and operating in close proximity to one another for many years. The Marine Casualty Investigation Board (MCIB) has made safety recommendations addressed to the University of Galway Boat Club, Rowing Ireland and Sport Ireland, all rowing clubs operating on the River Corrib, Water Safety Ireland, and the Minister for Transport.

Note: Times are local time = UTC + 1 (Co-ordinated Universal Time + 1 hour).

2. FACTUAL INFORMATION

2.1 Vessel Particulars

	Boat 1: The Coxed Quadruple.	Boat 2: The Coxed Four.
Owner:	University of Galway Boat Club.	University of Galway Boat Club.
Builder:	Empacher Boats, Germany.	Filippi Boats, Italy.
Model:	R45.	F34.
Serial Number:	R45T174.	F34DB18H.
Year Built:	2006.	2011.
Length Overall:	12.89 metres (m).	11.7 m.
Breadth:	0.46 m.	0.48 m.
Weight:	51 kilograms (kg).	51 kg.

2.2 Marine Casualty Information

Type of Incident:	Marine Casualty.
Date and Time:	14 January 2023, 12.03 hours (hrs).
Location:	Salmon Weir, River Corrib, Galway City, Co. Galway.
Position:	Latitude 53°16.71' N, Longitude 09°03.32' W.
Casualty Event:	The allision of two vessels on a weir's safety booms leading to the capsize of the vessels.
Vessel Type:	Two Olympic style rowing boats.
Persons Onboard:	Ten (five in each vessel).
Voyage Type:	Recreational, during a rowing club's training session.
Vessel Operation:	On passage.
Voyage Segment:	Mid-water.
External Environment:	Daylight; westerly wind, fresh to strong Force 5 or 6 occasionally near-gale Force 7, gusts of up to 45 kts (kt) may have occurred; visibility good; air temperature 4 –

8°Celsius (C); water temperature 7°C.

Consequences: Loss of the two vessels. Threat of death or serious injury to the crews.

2.2.1 This incident resulted in a marine casualty as defined in section 2 of the Merchant Shipping (Investigation of Marine Casualties) Act, 2000, which defines a marine casualty and a vessel in the following terms:

"'marine casualty" means an event or process which causes or poses the threat of—

(a) death or serious injury to a person;

(b) the loss of a person overboard;

(c) significant loss or stranding of, or damage to, or collision with, a vessel or property; or

(d) significant damage to the environment,

in connection with the operation of—

(i) a vessel in Irish waters;

(ii) an Irish registered vessel, in waters anywhere; or

(iii) a vessel normally located or moored in Irish waters and

under the control of a resident of the State, in international waters contiguous to Irish waters, and includes an accident or damage referred to in section 26(1)(b);

"vessel", in relation to a marine casualty, means a vessel or craft (or part of a vessel or craft) which at the time of the casualty—

(a) is registered in the State, or

(b) is located in the State (including in Irish waters), or(c) being a vessel normally located or moored in Irish waters, is under the control of a resident of the State in international waters contiguous to Irish waters,

and capable of being used, or intended to be used, for navigation or transportation on water, but does not include a seaplane."

2.3 The River

2.3.1 The River Corrib has a prominent position in the centre of Galway city, and a long history of use for recreational and competitive rowing. The river flows south from

Lough Corrib into Galway Bay, over a length of approximately six kilometres (km). A feature of this river is that it has a large catchment area of approximately 3,113 km^2 relative to its short six km length, and at a relatively high average flow rate of 104 cubic metres per second[1]. See Figures 1 and 2.

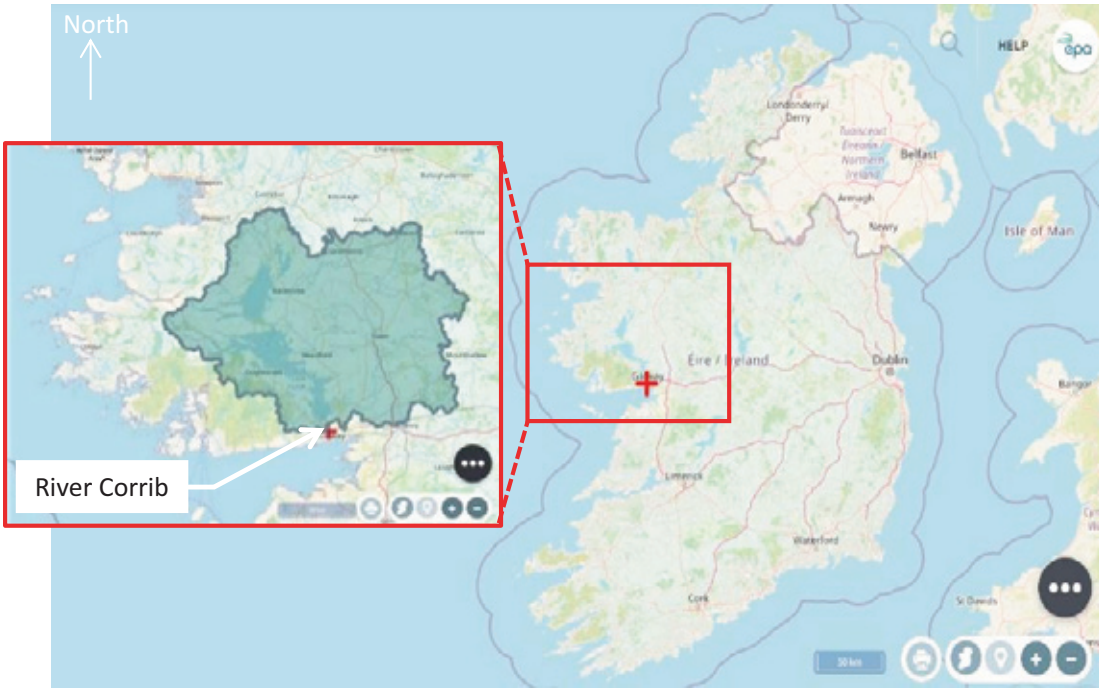


Figure 1: The River Corrib's large catchment area.
Source: Environmental Protection Agency https://gis.epa.ie

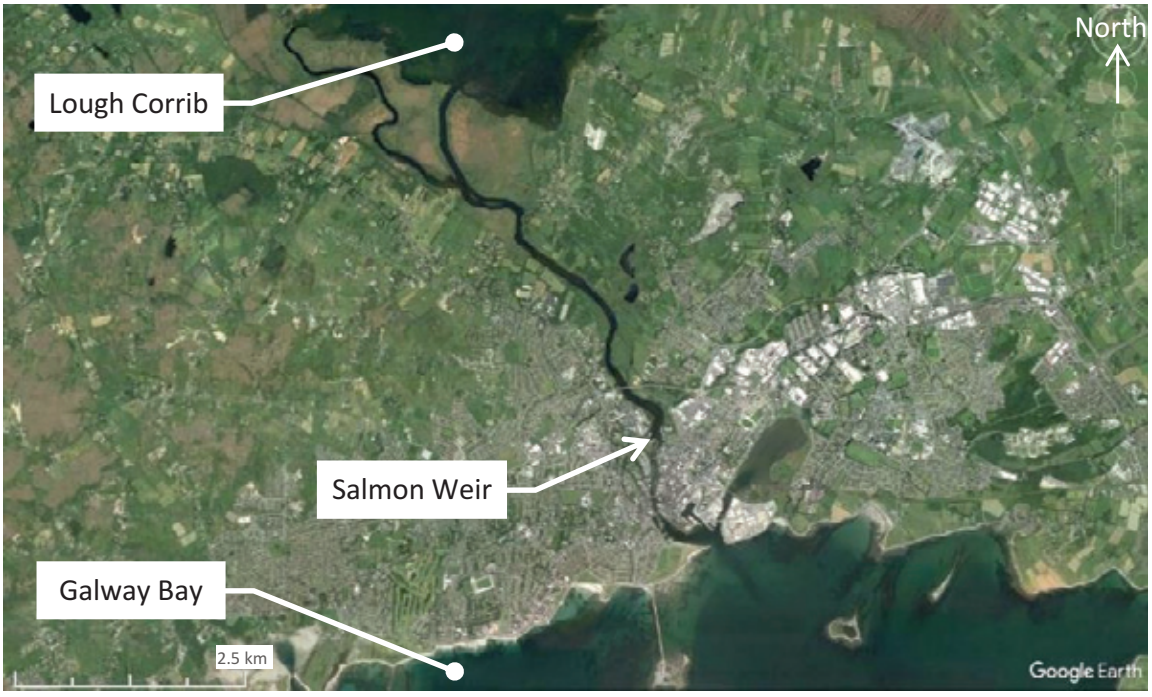


Figure 2: The River Corrib, which flows south into Galway from its source in Lough Corrib.
Source: Google Earth.

1. Environmental Protection Agency, www.catchments.ie/data/#/catchment/30?_k=svi676 and www.catchments.ie/data/#/waterbody/IE_WE_30C020600?_k=13yu2b

2.3.2 For comparison, the River Liffey[2], which flows through Dublin city and also has a long history of use by competitive rowing clubs, has a catchment area (1,256 km^2) that is 60% smaller, a 132 km length that is 20 times longer, and an average flow rate of 18 cubic metres per second that is 80% less than the River Corrib. From the Salmon Weir in the centre of the city, there is more than 5 km upstream to its source at Lough Corrib, and less than 1 km downstream to its confluence with the sea at Galway Bay. It is the upstream section of the river that is utilised by the rowing clubs operating in Galway city, including the University of Galway's campus and boat club that are located along its western bank across from the Salmon Weir.

2.3.3 Recreational and competitive rowing on the river dates back more than 150 years. There are eight[3] rowing clubs operating from either side of the Salmon Weir; six on the west side and two on the east side. See Figure 3. Most weekends there are typically[4] 150 – 200 people out on the river training in competitive rowing boats, including six or seven boats from the University of Galway Boat Club.

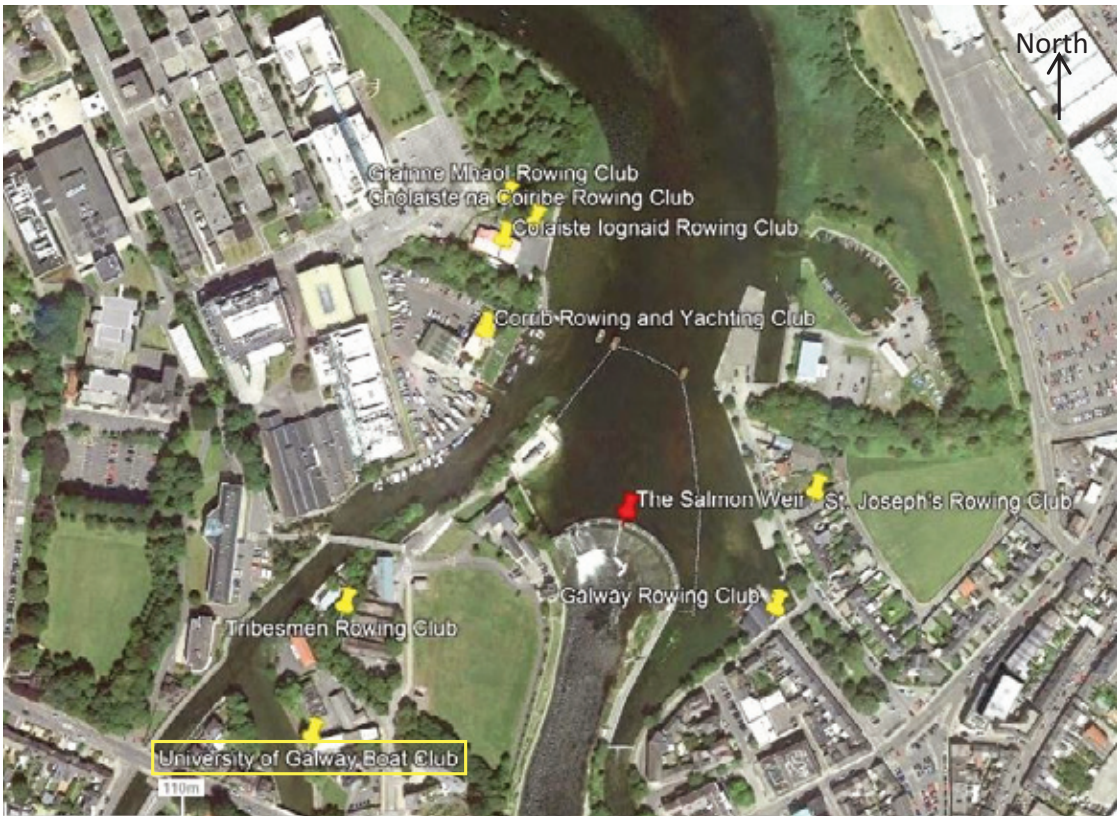


Figure 3: The location of rowing clubs on the River Corrib in Galway city.
Source: MCIB Investigation. Image Source: Google Earth.

2. web.archive.org/web/20160303222354/http://www.serbd.com/MultiDownloads/Creport/Chapters/Physical%20Description%20Ch3.pdf

3. Coláiste Iognáid Rowing Club; Corrib Rowing and Yachting Club; Coláiste na Coiribe Rowing Club; Galway Rowing Club; Grainne Mhaol Rowing Club; St. Joseph's College Rowing Club; Tribesmen Rowing Club; University of Galway Boat Club.

4. Source: The University of Galway's Director of Sport

2.3.4 The river's water temperature[5] was cold at the time of this casualty event, of approximately 7°C. See Figure 4. This was the coldest time of the year for the water temperature. The water temperature typically remains at or around this low temperature for a four-month period from December to March. The water temperature typically increases steadily from April through to a peak summer-time temperature in July – August of approximately 20°C, before cooling steadily from September. The water temperature is typically below 15°C for an eight-month period from October to May.

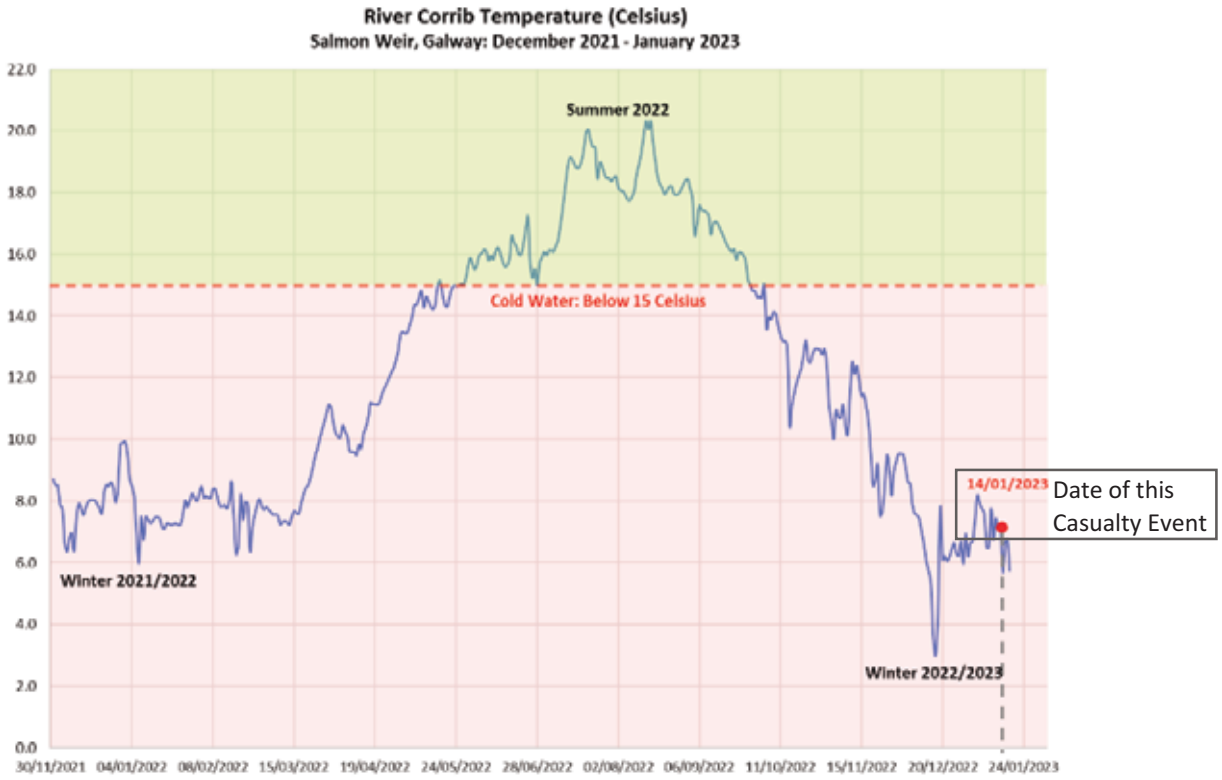


Figure 4: The River Corrib's water temperature (Celsius) over the 1-year period prior to this casualty event. Graph by: MCIB Investigation. Source Data: Office of Public Works.

5. Office of Public Works, Hydrometric Department.

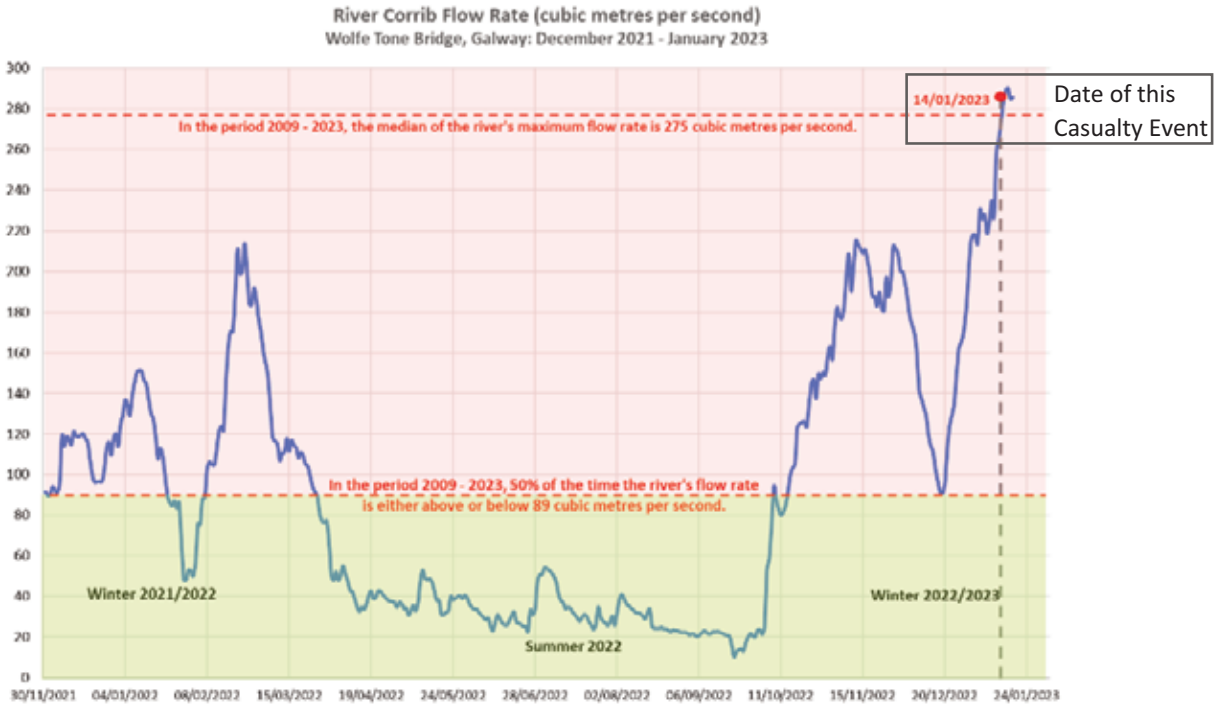


Figure 5: The River Corrib's flow rate (cubic metres per second) over the 1-year period prior to this casualty event. Graph by: MCIB Investigation. Source Data: Office of Public Works.

2.3.5 The river was in spate[6] on the day of this casualty event, and in the weeks before and after. See Figure 5. Approximately 300 cubic metres of water was flowing[7] over the weir every second. This was not an unusual amount of water for this river, as 275 cubic metres per second is the median of the river's maximum flow rate over the last 14 years, 2009 – 2023. The river typically has a low flow rate for a six-month period between April and September, and a high flow rate in October through to March.

2.3.6 There was not just a large amount of water in the river on the day of this casualty event, but it was also flowing[8] at a fast speed, of approximately 5 kts (2.57 m per second). A person or boat in the water would therefore be carried a distance of 100 m in a time of approximately 39 seconds.

2.3.7 Recreational boaters familiar with this river, and who spoke with the MCIB during this investigation, highlighted how:

- A somewhat unusual feature of this river is that, upstream of the weir during winter months, as the river's flow rate increases its depth of water tends to decrease. This occurs because of how effective the weir's open sluice gates are

6. *When a river is in spate it contains a lot more water than usual and is flowing very fast.*
Source: www.collinsdictionary.com/dictionary/english/in-spate

7. Based on data provided by the Hydrometric Department of the Office of Public Works.

8. Measurement by Galway Fire & Rescue Service on 15 January 2023 (the day after this incident).

at conveying water through the weir. In contrast, during summer months when there is less rainfall, the river's depth increases because the weir's sluice gates tend to be closed.

- The natural build-up of silt on parts of the river bed, and the natural reed growth in the river and along its banks, tend to become more pronounced during winter months, as the combined effect of the river's faster flow rate and its reduced depth makes safe navigation more difficult.

- Their experience of predicting the actual flow rates is made more difficult by the effects of wind direction. If there has been a period of wind from the south, this has the effect of holding back water in the lake instead of releasing it down along the river's flow towards the south, meaning the flow rate tends to decrease.

- Allowing for the above, their general experience is that, when all of the weir's sluice gates are open during winter conditions, the river's flow rate is particularly high and only experienced crews can operate safely on the river in the vicinity of the weir.

2.3.8 The river's flow rate had been monitored and published online[9] by the Office of Public Works. This information was accessible online to the public – both numerically and graphically – on the day of this marine casualty and for years beforehand.

2.3.9 Galway City Council[10] describes how the Lough Corrib Navigation Trustees have responsibilities for certain aspects of navigation on the River Corrib:

"The Lough Corrib Navigation Trustees were established by the Navigation Act of 1859 made by the Commissioners of Public Works in Ireland. The Trustees are responsible for the maintenance of navigation aids, a limited number of piers on the Corrib system, maintenance of the Eglinton canal system, associated walkways, tow paths, lock gates and boundary walls. The Trustees meet four times a year with the Officials of Galway City Council."

2.3.10 Other entities[11] are likely to have responsibilities and interests in relation to the River Corrib's watercourse, its use and maintenance, including Galway City Council, the Office of Public Works, the Environmental Protection Agency, Irish Water, Inland Fisheries Ireland, the National Parks & Wildlife Service, the Local Authority Waters Programme, and the Galway Waterways Foundation. The MCIB's investigation received multiple reports from members of the public with an interest in the use of the River Corrib, relaying difficulties they had encountered with issues involving recreational use of the River Corrib, including issues involving silting of the river, reed growth on the banks, the

9. Retrieved 14 March 2023: https://waterlevel.ie/hydro-data/#/overview/stations/station/11759/Wolfe%20Tone%20Bridge/Flow?period=PoR

10. https://www.galwaycity.ie/lough-corrib-trustees-information

11. https://galwaycitycommunitynetwork.ie/wp-content/uploads/2022/01/Galway-waterways_governance_cityCouncil_2021_final.pdf

depth of water in the river, and the river's flow rate.

2.3.11 The subject of the river's conditions and its relevance to this marine casualty event are analysed in Section 4.2 of this report.

2.4 The Weir and its Environs

2.4.1 The main feature on the River Corrib in Galway city is the Salmon Weir, also known as the Regulating Weir. This is under the active control of the Office of Public Works, which controls the opening and closing of the 16 sluice gates to regulate the amount of water passing down the weir. These managing actions affect the depth of water upstream in the River Corrib, Lough Corrib and Lough Mask, and the River Corrib's flow rate both upstream and downstream of the weir. The effect of this can be seen in the significantly different conditions that typically occur at the weir during winter and summer conditions. See Figures 6 and 7.

2.4.2 Downstream of the Salmon Weir, the river is classified[12] as a Grade 2–3 whitewater river, because of the presence of the hydraulic features created by the fast flow and in-river obstacles. This means that the river's difficulty is classified as Moderately Difficult, with stretches that are Difficult.

Figure 6: The Salmon Weir during winter flow conditions (in March 2023), when all 16 sluice gates are open.

12. Source: *Irish Whitewater: A guide to Irish Whitewater Rivers and Surf,* 2nd Edition, 1996.

Figure 7: The Salmon Weir during summer flow conditions (in August 2023), when only two of the 16 sluice gates are open.

2.4.3 The weir presents a number of hazards for persons on or in the river, and for anyone attempting to rescue a person or object from the river. Downstream of the weir is fast flowing whitewater, with a riverbank that is difficult to access from shore or to egress from the river. See Figure 8.

Figure 8: The whitewater extending downstream from the weir.
The Salmon Bridge is in the background, located 250 m downstream from weir.

2.4.4 Located 250 m downstream of the weir (a float time of 97 seconds[13] for a person in the water when the river is in spate) is a major hazard to either a person in need of rescue or the emergency services[14] attempting a rescue, consisting of old steel boxes used to trap eels, which forms a man-made, near river-wide obstacle. See Figures 8 – 10. This severely limits the response that the emergency services can provide to an incident at or below the Salmon Weir.

Figure 9: The river-wide obstacle at the Salmon Bridge, viewed from upstream.

Figure 10: The river-wide obstacle at the Salmon Bridge, viewed from downstream.

13. Based on the river speed of five kt/2.57 metres per second, measured by Galway Fire & Rescue Service on the day after this incident.

14. https://afloat.ie/port-news/galway-harbour/item/59664-galway-fire-and-river-rescue-crews-endangered-by-disused-traps-on-corrib

2.4.5 The severity of a weir's hazards, and their likelihood to cause harm can all be assessed[15] and rated. Authoritative guidance[16] on this issue recommends that:

"A risk assessment should identify the hazards at a weir, the people who may be harmed and likelihood of them coming to harm, and the ease of self or assisted rescue if they get into difficulty…

Those affected can be water or land-based, e.g. operation and maintenance staff, boaters, canoeists, swimmers, anglers and walkers, particularly those affected by alcohol or drugs, and young people who use a weir or sluices for recreation without appreciating the hazard. The groups affected by hazards are not always obvious as recreation activities often take place outside working hours and may be seasonal. The full range of flow and tailwater conditions should be considered as the hazards and ease of rescue may be different under certain conditions.

A risk assessment should be reviewed periodically, with more frequent assessments if there is a serious incident or accident, if there are changes to the site or before works such as design, maintenance, operation and removal."

2.4.6 Located immediately above the top of the weir is a series of steel chains on steel poles that act as a final barrier against objects or persons in the water being carried down through the weir. See Figures 11 and 12.

Figure 11: The chain protection, immediately above the Salmon Weir.
Viewed from downstream.

15. Weir Assessment System. www.rescue3europe.com/wp-content/uploads/2021/10/Weir-assessment-system-2016-v.21.0-NRW-logo.pdf

16. River Weirs: Design, Maintenance, Modification and Removal, Construction Industry Research and Information Association, 2016. ISBN:978-0-86017-778-4

Figure 12: The chain protection, immediately above the Salmon Weir.
Viewed from upstream.

2.4.7 Located 100 m upstream of the weir is a river-wide safety boom formed from steel floats interlinked with steel chains. This had the effect of creating an area of enclosed water above the weir. See Figures 13 and 14.

Figure 13: The enclosed water, extending 100 m upstream from the weir.

Figure 14: Example of the safety boom in place above the weir.

2.4.8 When these safety booms were installed in the 1980s the old railway bridge piers from a defunct Victorian era railway line were utilised as fixings points for the chains/supports for the safety booms. See Figures 15 and 16. As the railway bridge had crossed the river at right angles, the use of the railway bridge piers as the safety booms' anchor points created a physical barrier at right angles to the river. The safety booms are also anchored with chains to the river bed. This arrangement means that the section of safety booms across the middle part of the river are enclosed on both sides by the walls of the bridge piers, and the safety booms have sagged downstream. This means that objects or persons entering onto this part of the safety booms can only progress downstream into the weir or await human extraction back upstream against the flow; they cannot extract themselves. This is the situation that occurred during this casualty event.

Figure 15: The safety boom protection, 100 m upstream from the Salmon Weir.

Figure 16: The safety boom protection, 100 m upstream from the Salmon Weir.

2.4.9 On the subject of physical barriers at a weir, modern authoritative guidance[17] recommends that safety booms are installed at an oblique angle relative to the river's direction of flow, not at right angles. See Figure 17. This guidance states that:

"Safety booms should be provided if there is a risk of boats accessing or overtopping the weir crest. Those designed to restrain loose powered craft can be a dangerous barrier to unpowered craft, particularly in strong stream or spate conditions. Booms also collect debris, which can be dangerous to the public and costly to remove.

Install a boom at an oblique angle across a river (Figure 10.6a). This will direct the debris to one bank from where it can be removed readily, and allow swimmers and boaters caught up in the boom to move along the boom to the bank. The boom end pile or fixing point should be on or set into the bank to allow self-rescue by people from the environment to the bank, and the bank should be easy to access and egress.

Avoid installing a boom at right angles across a river as it will sag downstream, taking up a 'U' shape in plan. This will accumulate debris in the centre of the river, and canoeists and swimmers trapped at the middle of the 'U' will be unable to get out, swim or paddle back against the current…"

17. *River Weirs: Design, Maintenance, Modification and Removal,* Construction Industry Research and Information Association, 2016. ISBN:978-0-86017-778-4

a A safety boom upstream of a weir should be installed at an oblique angle to direct debris towards one bank where it can be removed.

Figure 17: Recommendations relating to the alignment of safety booms relative to the direction of water flow. Source: Figure 10.6a, *River Weirs: Design, Maintenance, Modification and Removal*, Construction Industry Research and Information Association, 2016.

2.4.10 The subject of the weir and its relevance to this marine casualty event are analysed in Section 4.6 of this report.

2.5 The Weather

2.5.1 On the morning of this casualty event, the 14 January 2023, Met Éireann[18] published a Sea Area Forecast at 06.00 hrs, which was approximately five hours before the crews involved in this casualty event embarked on the river. This was a professional meteorologist's assessment of what the weather conditions were likely to be in the forecast area.

See Appendix 7.1 - Met Éireann (Pre-Incident) Weather Forecast.

18. *Met Éireann, Ireland's National Meteorological Service, is maintained by the State under the UN Convention of the World Meteorological Organisation (WMO) and is the leading provider of weather information and related services in the State. Met Éireann operates the national meteorological observational network to WMO standards and the data is securely stored in the national climate archive.* Source: Met Éireann.

2.5.2 Winds on the western seaboard were forecasted to be:

"Increasing west to northwest force 7 or gale force 8 and gusty imminent [within 6 hours]. Soon becoming westerly and increasing to strong gale force 9 in the north, reaching storm force 10 between Bloody Foreland [Co. Donegal] and Fair Head [Co. Antrim]. Later decreasing north to northwest force 6 to gale force 8."

2.5.3 A Small Craft Warning and a Gale Warning were in effect for the Galway coastline and beyond, with a warning that:

"West to northwest winds will increase to gale [Force 8] or strong gale [Force 9] on Saturday afternoon on Irish coastal water from Loop Head [Co. Clare] to Malin Head [Co. Donegal] and on the North Irish Sea…"

2.5.4 The script that Met Éireann issued to regional radio stations warned that:

"Today will be cold with scattered showers and some sunny spells. It will turn rather windy this afternoon and evening with fresh to strong and gusty westerly winds. Isolated hail and lightning are possible, with some falls of sleet over high ground. Afternoon temperatures of 4 to 7 degrees.

Winds on Galway Bay: West to northwest force 6 to 7 increasing to gale force 8 and gusty this afternoon."

2.5.5 The script that Met Éireann published on its website www.met.ie warned that:

"Today will be cold with sunny spells. Showers will extend eastwards and become widespread, some heavy with hail and isolated thunderstorms possible. This afternoon, westerly winds will strengthen and will become very strong in the northwest and north with gales and severe gusts in coastal areas. Highest temperatures of 4 to 7 degrees."

2.5.6 Met Éireann has also prepared a post-incident weather report[19] with a professional meteorologist's assessment of what the weather conditions are likely to have been in the River Corrib area of Galway city on the day of this casualty event.

This report describes how:

"A depression to the north of Ireland steered an active cold front eastward across the country in an unstable and freshening westerly airflow. West-south-westerly winds were moderate at first Force 4 (mean wind speed 12 to 16 kts) until around 06:00 hours. Winds gradually increased and veered westerly fresh to strong Force 5 or 6 occasionally near-gale Force 7 (mean wind speed 17 to 32

19. *An official Legal Weather Report contains the meteorologist expert opinion based on the available meteorological information as to the probable weather conditions in a location for a specific time period. The facts and data contained in this report are based on the balance of probability and the best informed estimate based on the available meteorological information at the time of compiling this report. Meteorological reports are produced without the benefit of a site visit or investigation. Data analysed to produce the report includes: ground based observations, radar and satellite imagery, surface weather analysis charts and lightning data, all which are retrieved from the national climate archive.* Source: Met Éireann.

kts); gusts up to 45 kts may have occurred."

See Appendix 7.2 - Met Éireann (Post - Incident) Weather Report

2.5.7 The subject of the weather conditions and its relevance to this marine casualty event are analysed in Section 4.1 of this report.

2.6 The Rowing Boats

2.6.1 The University of Galway Boat Club's rowing boats that were involved in this casualty event were competitive, Olympic-style rowing boats. This type of boat is a small, narrow vessel that the occupant(s) propel by means of either a single oar (held by both hands, known as 'sweep' rowing) or two oars (held in each hand, known as 'scull' rowing).

2.6.2 These two rowing boats were damaged beyond repair by this marine casualty event. The partial remnants of these boats were taken from the river and put in temporary storage in the University of Galway Boat Club. See Figure 18.

2.6.3 Boat 1 was a Coxed Quadruple (See example in Figure 19). This was a five-person vessel, comprising the coxswain seated near the bow and a crew of four rowers. The boat was configured for scull rowing; each of the rowers had two oars (one held in each hand).

2.6.4 Boat 2 was a Coxed Four (See example in Figure 20). This was a five-person vessel, comprising the coxswain seated near the bow and a crew of four rowers. The boat was configured for sweep rowing; each of the rowers had one oar (held by both hands).

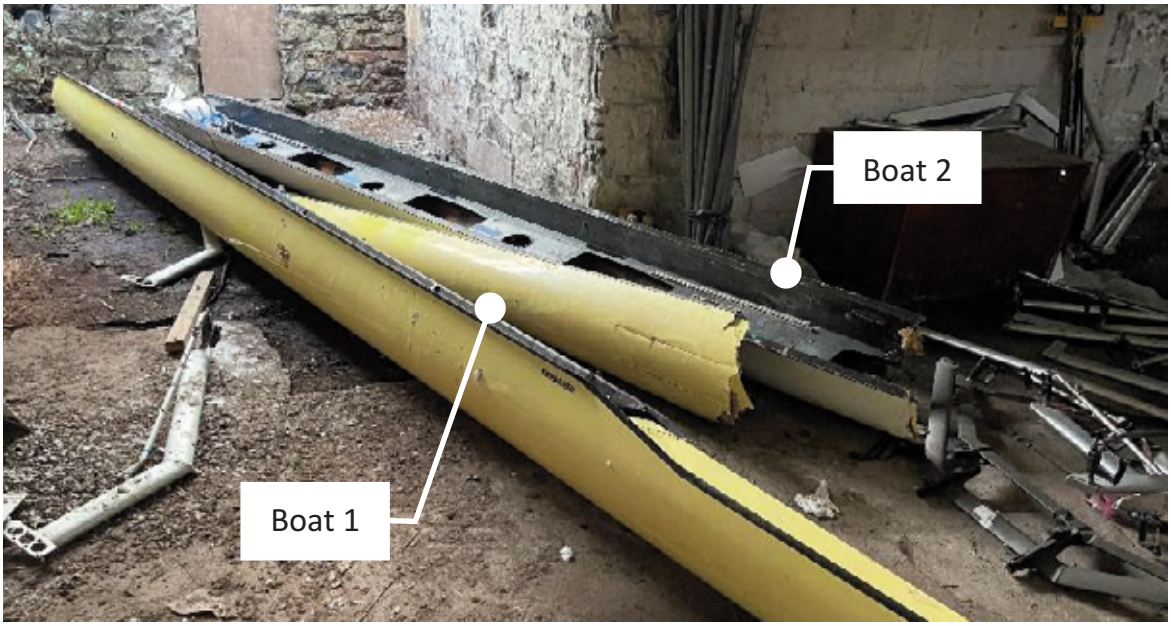


Figure 18: The remnants of the two rowing boats involved in this casualty event.

Figure 19: Example of a Coxed Quadruple rowing boat, similar to Boat 1.
Photo Source: https://rowing-shop.com/shop/equipment/swift/boats/boats-boats/swift-club-a-coxed-quadruple-scull-rowing-boat/

Figure 20: Example of a Coxed Four rowing boat, similar to Boat 2.Photo Source: www.nauticexpo.com/prod/filippi/product-22350-230243.html

2.6.5 Each rowing position in the boats was fitted with a sliding seat, with fixed footrests comprising fitted shoes having quick release 'Velcro' fasteners. Aluminium outriggers with oar rowlocks were fitted to receive the oars. See Figure 21.

Figure 21: Example of the seating position in a competitive rowing boat, configured for sweep rowing (with only a single oar per rower).

2.6.6 The crew sitting positions in each of the University of Galway Boat Club's boats were as follows:

- The coxswain was positioned at the bow[20], facing forward.
- The crew sat behind the coxswain, facing aft[21]. The crew's positions are numbered 1 to 4. Seat position number 1 (known as the 'stroke' position) is furthest aft, and seat position number 4 (known as the 'bow' position) is furthest forward.

2.6.7 The two rowing boats were lightly constructed as is usual for boats of this type, using various synthetic materials combined to form a lightweight honeycomb core sandwich, with a resin providing the waterproof membrane on the interior and exterior. Reserve buoyancy was provided by a sealed buoyancy compartment in the bow and stern, plus additional smaller buoyancy compartments extending along the length of the boats.

2.6.8 The European Union's Directive on Recreational Craft and Personal Watercraft is Directive 2013/53/EU (as amended). A rowing boat is a recreational craft, but the design and construction requirements set out in the Directive's Part A of Annex 1 do not apply as such boats are designed to be propelled solely by human power.

20. The front of the boat.
21. Towards the stern / rear of the boat.

2.7 The Coaches' Boats

2.7.1 The coach's launch boat that accompanied the crews from the University of Galway Boat Club was a powerboat of catamaran design, powered by an outboard petrol engine, built by Rowing Solutions of the United Kingdom, and known colloquially as a Cat. See Figure 22. This boat type is designed[22] for a maximum of four persons, or a maximum load of 400 kg including occupants. It is marketed for use as a coaching boat for competitive rowing.

Figure 22: Example of the Cat powerboat used by the University of Galway Boat Club's coach during this casualty event. Photo Source: www.rowingsolutions.com

2.7.2 The coach's launch boat that accompanied the crews from Coláiste Iognáid Rowing Club was the Sportsman 400, which is an aluminium, flat-hulled powerboat, powered by an outboard petrol engine, made by Linder Boats of Sweden, and known colloquially as a Tinny. See Figure 23. This boat type is designed[23] for a maximum of four persons, or a maximum load of 420 kg including occupants. This is the same design of boat that was being used by the coach of Coláiste Iognáid Rowing Club to oversee that club's rowing activity that took place at the same time as this marine casualty.

2.7.3 The Cat and Tinny are also the two primary types of coach's boats operated by the other rowing clubs based in Galway city. Both types of coach's boat have been declared by their manufacturers as Category D vessels in accordance with the EU Recreational Craft Directive, meaning they have been declared as suitable for use in conditions such as winds that do not exceed Beaufort force 4.

22. www.rowingsolutions.com/s/EU-UKCA-Declarations-RS-eCAT16-copynumbers-English.pdf
23. https://linder.se/en/sportsman-400

Figure 23: Example of the Tinny powerboat that was used by the Coláiste Iognáid Rowing Club coach, and also other club cloaches that assisted in rescuing the crews of University of Galway Boat Club from the weir's safety booms.

2.7.4 Operators of the Cat boats who spoke with the MCIB as part of this investigation all commented on how this boat benefitted from a high seating position and was therefore useful for observing and directing rowing crews under their control; however, the Cat boats lacked the power and manoeuvrability needed to operate as a rescue boat in the conditions presented by the River Corrib upstream of the Salmon Weir. In particular, the boat could not be relied upon to extract either itself or another vessel off the safety booms above the weir. Implicit in that description is the understanding that rowing clubs operating in Galway city were aware that this was a realistic scenario that could be encountered during a rowing session. The MCIB notes that those particular conditions – operating as a rescue boat, towing against a strong flow, and extracting a vessel that had grounded or allided[24] – are not conditions that a Category D craft has been type-tested to perform in.

2.7.5 The subject of the coach's boat and its relevance to this marine casualty event are analysed in Section 4.7 of this report.

2.8 The University of Galway Boat Club

2.8.1 The University of Galway Boat Club describes[25] itself in the following terms:

"University of Galway Boat Club is one of the most successful clubs in the University and indeed in Irish rowing. In the last decade, we have captured

24. A vessel underway that strikes a stationary object is said to have allided with the object. Noun: allision.

25. Source https://sport.universityofgalway.ie/clubs/rowing

numerous National Championship titles across the board - Men's and Women's; Senior, Intermediate and Club; Novice; Masters; eights; fours; quadruples; pairs; doubles; even the single scull. If anyone has raced it, we've won it.

This past season saw the club take home 9 championship titles, making us the most successful club at the National Rowing Championships. Two of these were in novice events, which is testament to UGBC's unparalleled novice programme."

2.8.2 The University of Galway Boat Club is affiliated with Rowing Ireland. The University of Galway Boat Club is under the direct control of the University of Galway, not its Students' Union. Rowing activities in the University of Galway Boat Club are overseen by one full-time, employed Head Coach and multiple volunteer coaches.

2.8.3 The club's Code of Conduct described separate requirements for athletes and coaches.

See Appendix 7.3 - University of Galway Boat Club – Code of Conduct. The Coaching Code of Conduct required that:

"As a coach of University of Galway Boat Club, you will:

- *Act as a good role model*
- *Encourage and be positive during sessions so that athletes leave with a sense of achievement*
- *Promote athletes' development regardless of their gender, ability, cultural background, or religion*
- *Set challenging, realistic but achievable goals.*
- *Plan and prepare each session appropriately and ensure proper levels of supervision*
- *Be aware of weather forecast and avoid training in unsafe conditions*
- *Enforce the principles of fair play treating each athlete equally, with dignity and respect and ensure that all athletes play within the rules.*
- *Prepare athletes to respond to both success and failure in a dignified manner.*
- *Promote the values of team spirit and fair-play*
- *Discourage inappropriate behaviour in training, competition, and away from the sporting arena.*
- *When conflicts occur among coaches or with athletes, attempt to resolve these conflicts in a responsible and objective manner that respects all parties involved and minimizes disruption."* [Emphasis Added]

2.8.4 The club operates an Emergency Action Plan with the stated aim that:

"The actions taken in the first few minutes of any emergency can save life, reduce scale of injury, restrict damage. As a club member it is important that you familiarise yourself with this document".

See Appendix 7.4 - University of Galway Boat Club – Emergency Action Plan.

2.8.5 The club's Emergency Action Plan:

- Required that coach boats must carry at all times the following items:

  - *"Mobile phone in dry bag*

  - *Rescue Bag (First aid bag, blankets, knife, throw line, whistle)*

  - *Paddle*

  - *Tow line*

  - *Sound signalling device (whistle)."*

- Identified the need for a *"Control Person"* and a *"Course Person"* to carry out tasks to assist during a rescue incident, without identifying who these persons are or how they could realistically be present to assist in an emergency situation.

- Instructed coaches operating launch boats during an emergency afloat to *"Turn off the engine"* but this instruction does not reference whether it applies to the very different conditions of the calm water of the canal or the fast flowing river upstream from the weir.

- Erroneously identified that the phone number 911 (not 999) should be used to contact the emergency services.

2.8.6 The University of Galway Boat Club's Safety Statement dated 5 January 2022, included a 4-page risk assessment for water activities.

See Appendix 7.5 - University of Galway Boat Club – Risk Assessment.

This identified many of the conditions that occurred during this casualty event, such as:

- For the hazard of *"Rough water (white caps)"*, the associated barrier to reduce the probability of a hazardous event occurring required that *"Stay on sheltered water possibly stay on the straights use lager (sic) and coxed boats 8+,4+ etc. Keep novice/inexperienced crews off water and depending on conditions and coach's judgement train on land."*

- For the hazard of *"Fast flow (lots of gates open or after heavy rain)"*, the associated barrier to reduce the probability of a hazardous event occurring required that *"Stay in tight to Jes bank and do not cross weir making way up river. Use larger boats 4+,4, 8+ etc and keep inexperienced rowers off the water especially in coxless boats."*

- For the hazard of *"Bad weather (very wet, wind or fog)"*, the associated barrier to reduce the probability of a hazardous event occurring required that *"Cancel rowing if conditions are unsafe. If session take place make sure to take necessary precautions, ensure all athletes have adequate gear/layers. In fog wait for it to clear and use lights on boats when visibility improves."*

- For the hazard of *"Other boats on the river"*, the associated barrier to reduce the probability of a hazardous event occurring required that *"Rowers comply with navigational rules of the river always sticking to bow side and sticking to markers on the lake But also, always keeping a good lookout."*

- For the hazard of *"Capsize or boats taking on water"*, the associated barrier to reduce the probability of a hazardous event occurring required that *"Ensure all rowers are competent swimmers and have practiced capsize drill. Ensure safety launch with qualified drivers are on the water. Provide launches with first aid equipment and thermal blankets to carry in the launch. Ensure any crew going out without a launch has notified someone that they are going up river."*

- For the hazard of *"Novice/inexperienced rowers"*, the associated *"action to maintain" required that "Coaches and Novice coaches make sure that safety launches go out with novice crews Coaches stay vigilant and monitor weather to ensure the water is safe to row on."*

- For the hazardous event of *"Rowers fall into the water and panic. The boat gets caught at the gates by the weir", the associated control measure was to "Teach novices what to do in event of a capsize. Keep novices in larger boat. Do not send out novices in too high winds or flow. Keep a safety launch with the rowers."*

- For the hazardous event of *"Capsize or boats taking on water"*, the associated control measure was to *"Ensure all rowers are competent swimmers and have practiced capsize drill. Ensure safety launch with qualified drivers are on the water..."*

2.8.7 The subject of the University of Galway Boat Club's systems and their relevance to this marine casualty event are analysed in Section 4.4 of this report.

2.9 The University of Galway Boat Club's Coach and Crews

The Coach

2.9.1 The University of Galway Boat Club's coach described how, at the time of this casualty event:

- She had more than 25 years' of rowing experience. She had completed two seasons as a volunteer with the University of Galway Boat Club: initially as an assistant to the club's senior crews in her first year, and then as an assistant coach for the club's senior crews in her second year. She was this year's coach of the club's novice crews, meaning that she was starting her third rowing season in a coaching role. She had completed Rowing Ireland's Introduction to Coaching Course. She had no prior coaching experience before joining this rowing club.

- She did not have any formal training or qualifications in:

  The operation of a powerboat.

  Use of a marine Very High Frequency (VHF) radio.

  First aid or emergency care.

2.9.2 The coach stated that she had been aware of the club's Safety Statement and its accompanying Risk Assessments, but she had not been aware of the club's Coaching Code of Conduct document or the club's Emergency Action Plan document.

The Crew

2.9.3 The rowers involved in this casualty event consisted of seven females and three males, all aged in their late teens or twenties.

2.9.4 The rowers were all novices, having taken up rowing for the first time in September 2022 at the start of that academic year, meaning they all had approximately three months' rowing experience. Their rowing experience was primarily confined to a nearby canal only, not the River Corrib. Prior to this casualty event, their experience of rowing on the River Corrib was minimal, typically being only once or twice. One crewmember had rowed on the river approximately 15 times. For another crewmember, the first time they had been on the River Corrib was the day of this casualty event. Most but not all of the crewmembers had attended a one-week training camp in the week prior to this casualty event.

2.9.5 All crewmembers described having a good swimming ability and being confident in water, and capable of swimming 50 m in light clothing if required. After this casualty event occurred, all crewmembers attended a swimming test (to demonstrate their ability to swim in light clothing) and a capsize drill (that

taught and practiced the actions to be taken in the event of a capsize), which was organised by the club in a local swimming pool. The crew had not been required to undertake either a swimming test or a capsize drill prior to this casualty event.

2.9.6 On the day of this casualty event, the coxswain in control of steering Boat 1 was the crew's full-time coxswain, who therefore had four months' experience in this role, whereas Boat 2 was being controlled by one of the rowers who had volunteered for that role that day, therefore having only occasional experience in this role.

2.9.7 The crew clothing typically consisted of lightweight leggings and two items of clothing on the upper body (typically a thermal top, jumper and/or raincoat).

2.9.8 All crewmembers described how:

- Their clothing became wet when the rowing boats capsized and they entered the water.
- They extracted themselves from the rowing boats by removing the quick release straps that held their feet in place, which allowed them to then climb up out of the water onto the safety booms where they variously remained for ten to fifteen minutes before being rescued. One crewmember was unable to extricate themselves promptly and needed to be assisted by another crewmember.
- They all became either cold or very cold during the casualty event. One crewmember described it being difficult to walk away from the bank after being rescued because of how cold their feet were. Other crewmembers described being freezing cold or the onset of shivering from the effects of the wet clothing and the feeling of being in shock.

2.9.9 The subject of the training and experience of the University of Galway Boat Club's coach and crew, and its relevance to this marine casualty event, are analysed in Sections 4.3 and 4.4 of this report.

2.10 Coláiste Iognáid Rowing Club

2.10.1 Coláiste Iognáid is a local post-primary level school, with a rowing club that is affiliated with Rowing Ireland. Coláiste Iognáid Rowing Club describes[26] itself in the following terms:

"The club's reputation and standing have been enhanced by successes in events around Ireland, including the national championships, and by the selection of Jes rowers to compete for Ireland in international events. With 80+ members, Coláiste Iognáid Rowing Club is now one of the largest in the country. The club's

26. http://www.circ.ie

reputation and standing have been enhanced by successes in events around Ireland, including the national championships, and by the selection of Jes rowers to compete for Ireland in international events."

2.10.2 On the morning of the 14 January 2023, the club had two rowing crews afloat, of school children aged 14–15 years, amounting to 18 persons. They were arranged into two eight-person rowing boats, each steered by coxswain (a total of nine persons per rowing boat). The coach who oversaw this activity described how he selected one of the rowing boats to be a mixed crew, of six females and two males, to take account of the weather and river conditions that day. Each rowing boat was separately overseen on the water by a coach's Tinny powerboat launch, each containing one coach and one assistant.

2.10.3 The Coláiste Iognáid Rowing club's coach who was overseeing this rowing trip described how:

- He had approximately 20 years' of rowing experience, and approximately ten years' of coaching experience in this rowing club. He had previously been the coach for a junior crew competing as the Irish team in an international regatta.
- He did not have any formal training or qualifications in:

  The operation of a powerboat.

  Use of a marine VHF radio.

  First aid or emergency care.

2.10.4 The club's two rowing boats commenced rowing within minutes of one another. The first rowing boat completed its trip, upriver to a turning point before returning to the club later that day (after the casualty event experienced by the University of Galway Boat Club had ended). The crew of the second rowing boat were in their second rowing season, having previously rowed in the 2021 – 2022 academic year. The second rowing boat commenced their activity, making their way upriver and turning the first corner nearby to their clubhouse (known as the Jes corner). This led to them observing the presence of the boats ahead from the University of Galway Boat Club, which were progressing downriver towards them.

2.10.5 The coach described how the parents of the crewmembers had signed a consent form confirming that their children could swim. The club did not require the crews to perform a swimming test. The club's requirement was that anyone identifying as being a non-competent swimmer was required to wear a buoyancy aid while rowing. This did not apply to any members of the crews on the water that day.

2.10.6 The coach's clothing consisted of a rain jacket over a fleece jacket, plus waterproof leggings over trousers, and Personal Flotation Device (PFD) (Buoyancy

Aid). The coach's assistant wore similar items, including a buoyancy aid. The rowers' clothing typically consisted of a tight thermal top over a one-piece rowing suit (shorts and integral vest), without any PFD (nor were they required by legislation to wear a PFD).

2.10.7 The coach described how the boat he was operating that day was the club's Tinny powerboat. This did not contain a bullhorn/megaphone or a VHF radio. This did contain:

- Two oars.
- A waterproof safety bag, containing scissors, knife, first aid kit, four blankets.
- Three spare Buoyancy Aids.
- A short, metal ladder (to assist with the rescue of a person from the water into the boat).
- A throw rope.

2.10.8 The coach and his assistant had their mobile phones in their pockets. These phones were not in a waterproof pouch. Neither person carried a VHF radio, and they did not have a knife on their person.

2.11 Rowing Ireland

2.11.1 Rowing Ireland is:

- Affiliated with World Rowing[27] which: sets the rules and regulations for the practice of the sport; oversees sanctioned international rowing regattas; and assists in the development of coaching education.
- Recognised by the Irish Sports Council and the Olympic Federation of Ireland as the governing body of the sport and recreation of rowing in Ireland.
- Tasked with the development and promotion of rowing in Ireland and is grant funded to achieve these objectives.
- A non-statutory body and has no legislative power to regulate or accredit coaches. It has no legal basis to enforce standards of conduct.

2.11.2 In relation to safety within its affiliated clubs, Rowing Ireland's guidance[28] is that:

"Everyone involved in rowing has a duty of care to ensure their actions both on and off the water are conducted in a manner which does not compromise the safety of others. Rowing Ireland has the responsibility to develop and maintain

27. The International Rowing Federation / Fédération Internationale des Sociétés d'Aviron (FISA)
28. https://www.rowingireland.ie/supporting-our-clubs/health-and-safety/

a culture of safe practice to advise all our clubs that they can support everyone involved in the sport in their efforts to achieve this.

All decisions regarding safety at rowing clubs and rowing events should be based on risk management as no safety document can possibly cover all situations. By continually assessing likely risks and taking action to manage them, some generalised standards can be developed, enabling us to provide guidance on how to avoid and take action regarding unforeseen hazardous situations.

All clubs have a responsibility to provide information, education and training about safety to their members. Individual members also have a responsibility to find out, learn, question and implement safety best practice. It is essential that all clubs register their members with Rowing Ireland to ensure full cover for all members. In addition, clubs need to take into account their own local risks and should conduct risk assessments regularly.

Having safety in mind at all times is an important part of what it means to be a club member."

2.11.3 Rowing Ireland requires its affiliated clubs to submit details to it annually dealing specifically with safety within the club, including the name and contact details for the person with responsibility for safety within the club. In addition, clubs must submit a Self Assessment Safety Audit[29], which is a detailed series of queries that prompts clubs to create safety procedures and requires them confirm whether or not they:

- Assess the physical condition of their technical, safety and life saving equipment.
- Create an emergency action plan, and a safety statement that incorporates Rowing Ireland's standard risk controls.
- Review their risk assessments regularly and implement findings from past safety audits.
- Incorporate Rowing Ireland's Safety Manual into the induction process for club members.
- Display a safety notice board in a prominent position.
- Provide guidance to members on safety and risk assessments, health, welfare and appropriate behaviour.
- Liaise with other local water users/stakeholders to co-ordinate local water safety.

29. https://www.rowingireland.ie/2023-affiliations-and-club-self-assessment-safety-audit/

- Maintain first aid equipment and a record of members with a first aid qualification.
- Provide formal training to rowers with responsibility for steering boats and assess their competence in this role.
- Instruct members on the actions to take if a boat capsizes when the risks of cold water immersion and hypothermia have been identified.
- Assess members' ability to swim.
- Record that members' swimming ability and capsize drill training have been completed.
- Require members who are unable to demonstrate the minimum swimming standards to wear a life jacket or buoyancy aid, receive training in capsize procedure and reach a satisfactory level of competence.
- Establish and practice procedures for managing incidents, including capsizes.
- Designate the boats used by coaches as either a Coaching Boat, a Rescue Boat or a Safety Boat.
- Define the maximum weight and number of persons for all launch boats.
- Require the drivers of launch boats to receive formal training and qualifications in their use, such as the Powerboat Certificate.
- Require launch drivers to understand and follow the rules of the water upon which they are operating.
- Require launch boats to carry the equipment defined in Rowing Ireland's Safety Manual, and require launch drivers to check that this equipment is in the boat before going afloat.
- Require clubs to ensure that launch boats used as safety boats are fit for this purpose and crewed by two people.

2.11.4 In 2020, Rowing Ireland's Safety Advisory Committee created a presentation for its affiliated clubs "To assist clubs in developing Club Safety Statements". This explained for the clubs: the need to maintain a comprehensive safety statement; the required safety structure in clubs; the Safety Advisor/Responsible Person role in a club; the meaning of hazards and risks; risk ratings, risk mitigation and the process of carrying out a risk assessment.

2.11.5 In 2021, Rowing Ireland's Safety Advisory Committee published two Safety Bulletins[30] for its affiliated clubs explaining safety statements in clubs and the

30. https://www.rowingireland.ie/rowing-ireland-safety-advisory-committee/
https://www.rowingireland.ie/rowing-irelands-safety-bulletin/

steps to be followed in their preparation; examples of water based hazards while rowing ("weather, the rowing environment, the water, water obstacles, other water users, going afloat and landing") and risks. This included the guidance to clubs that:

"Many accidents take place because uninformed decisions are made before leaving the boathouse. Weather and water conditions, time of day, equipment, and supervision are all critical components that must be considered to have a safe training session."

2.11.6 In February 2023 (one month after this casualty event), Rowing Ireland's Safety Advisory Committee published Advisory Notice 1/Feb/23 (see Appendix 7.6 - Rowing Ireland – Advisory Note 1 February 2023). This is the template for a Session-Specific Risk Assessment that prompts coaches or solo rowers to consider the following key safety questions before deciding to go afloat, to assist them with determining if it is safe to proceed with the trip or whether control measures could be implemented to make the trip safer:

"1. All crew available?

2. Are the crew's skill level appropriate for conditions?

3. Are the crew dressed appropriately for the conditions?

4. Is the boat the appropriate type for the crew?

5. Is the boat in a safe and operational condition?

6. Is there a safety launch/coaches launch available?

7. Is the launch crewed by competent persons?

8. Will the weather conditions be favourable for the entire session? Wind speed, Direction, Flow state, Tide

9. Is it safe to launch and recover boat from this location?

10. Is the Coach/Cox wearing the appropriate PFD?

11. Are the crew familiar with the location and the risks and hazards that may be present?

12. Is the crew and coaches familiar with the club EAP (Emergency Action Plan)?

13. Is someone on shore aware of the start time and expected finish time of the session (Designated Person Ashore) DPA?

14. Is someone on shore aware of the location where the session will take place?

15. If I am a land-based coach, do I have a throwline?

16. If I am a land-based coach, has the coach and crew considered what to do in the case of an emergency?

17. At the end of the session will I report all unsafe incidents to the club and on the online iROWsafe Rowing Ireland incident reporting system?

18. At the end of the session will I report all defects or damage of the boat or equipment, to the appropriate club person?"

2.11.7 The subject of Rowing Ireland's systems and training provision, and its relevance to this marine casualty event, are analysed in Section 4.10 of this report.

2.12 Coach Training

2.12.1 As noted at Section 8.1 of the Code of Practice (CoP) for the Safe Operation of Recreational Craft:

"It is recommended that rowers undertake appropriate training. A number of training schemes and approved courses are available and information may be obtained directly from course providers including Rowing Ireland."

2.12.2 Rowing Ireland's training of coaches is a three-stage process known as the Coach Education Programme, consisting of training and awards in the following stages of a coach's development: Introduction to Coaching, Level 1 Coaching, and Level 2 Coaching.

2.12.3 In 2022 (the year prior to this casualty event), 166 members of Rowing Ireland had attended the Introduction to Coaching course, and another 102 attended the Level 1 Coaching course. The possibilities for training were curtailed in 2020 and 2021 because of the effects of COVID-19, with the courses being limited to 56 members attending the Introduction to Coaching course (in 2021 only). In 2019, 65 members attended the Introduction to Coaching course, and another 36 attended the Level 1 Coaching course.

2.12.4 The Introduction to Coaching course is a one-day course, involving both theory and practice, designed for those with no previous coaching experience who intend to operate as an assistant coach. One of the four theory sessions focuses on the planning of a training session, including assessment of the location, weather forecast, safety, and the selection of crew and boats. Another of the theory sessions focuses specifically on safety, including the Safety Advisor role in a club, capsize procedure, launch rescue, emergency procedures, hazards, and the awareness of water and weather conditions.

2.12.5 The Level 1 Coaching course is a three-day course, involving both theory and practice, designed for those who have been coaching on a regular basis for one year after completion of the Introduction to Coaching course. The training develops on what was covered in the previous award, and includes modules on safety afloat and the planning and organisation of a training session.

2.12.6 Two types of coach's boats were afloat on the day of this casualty event. Both are powerboats, each powered by an outboard petrol engine. Irish Sailing is the national governing body for powerboating.

2.12.7 The objectives of the National Powerboat Certificate[31] awarded by Irish Sailing are to develop the skills and knowledge necessary for a person to safely, and effectively, operate an open powerboat, by day, on inland and coastal waters with which they are familiar. A person who has completed this training has received experience in important skills such as:

- Selecting clothing to wear while afloat;
- Selecting a PFD appropriate to the activity and how to correctly wear it.
- Boat handling, including how to: maintain a powerboat away from a fixed or moored object, while allowing for the effects of wind and current; how to 'ferry glide' a powerboat across a channel against the current and/or wind.
- Accurately assessing wind and/or current while afloat;
- Dealing with a person overboard in the water, including how to manoeuvre the boat up to the person and then recover them into the boat, and how to manage the situation after the person has been recovered.
- Applying international navigation rules, including how to: correctly position a powerboat relative to a channel and other boats when manoeuvring in a confined channel, on a river or canal or within a harbour; manage the situation of two vessels approaching head on, and overtaking one another.
- Summoning assistance in an emergency.
- Understanding the different types of powerboat craft, the advantages and disadvantages of their different hull forms, with regard to use and ability afloat.
- Understanding how weather affects powerboating activities; how to identify sources of weather forecasts; how to interpret a weather forecast with regard to planned activities.

2.12.8 The objectives of the Safety Boat Certificate[32] awarded by Irish Sailing include training of the techniques and skills needed when powerboats are providing safety and rescue cover. A person who has completed this training has previously completed the National Powerboat Certificate and has gained additional experience in important skills such as:

31. www.sailing.ie/Portals/0/National-Powerboat-Certificate.pdf
32. www.sailing.ie/Portals/0/Safety-Boat-Certificate.pdf

- Identifying the vessel characteristics needed for a safety boat intended for use in different organisations and situations, including the appropriate hull and engine.

- Escorting other vessels and providing safety and rescue cover for them; identifying and equipping a safety boat for its intended use, considering the operating area and its intended role/activity.

- Boat handling in more challenging conditions than those trained during the National Powerboat Certificate, including: how to maintain a powerboat's position in the water alongside a capsized vessel or a free floating object in the water; how to come alongside another vessel that is underway; how to position a powerboat so as to communicate with those in control of other vessels; how to land and then relaunch a safety boat against a wind blowing onto a shore or bank; and, how to recover another vessel from a shore or bank against the wind.

- Assisting capsized vessels and their crews with recovery, re-entry and towing.

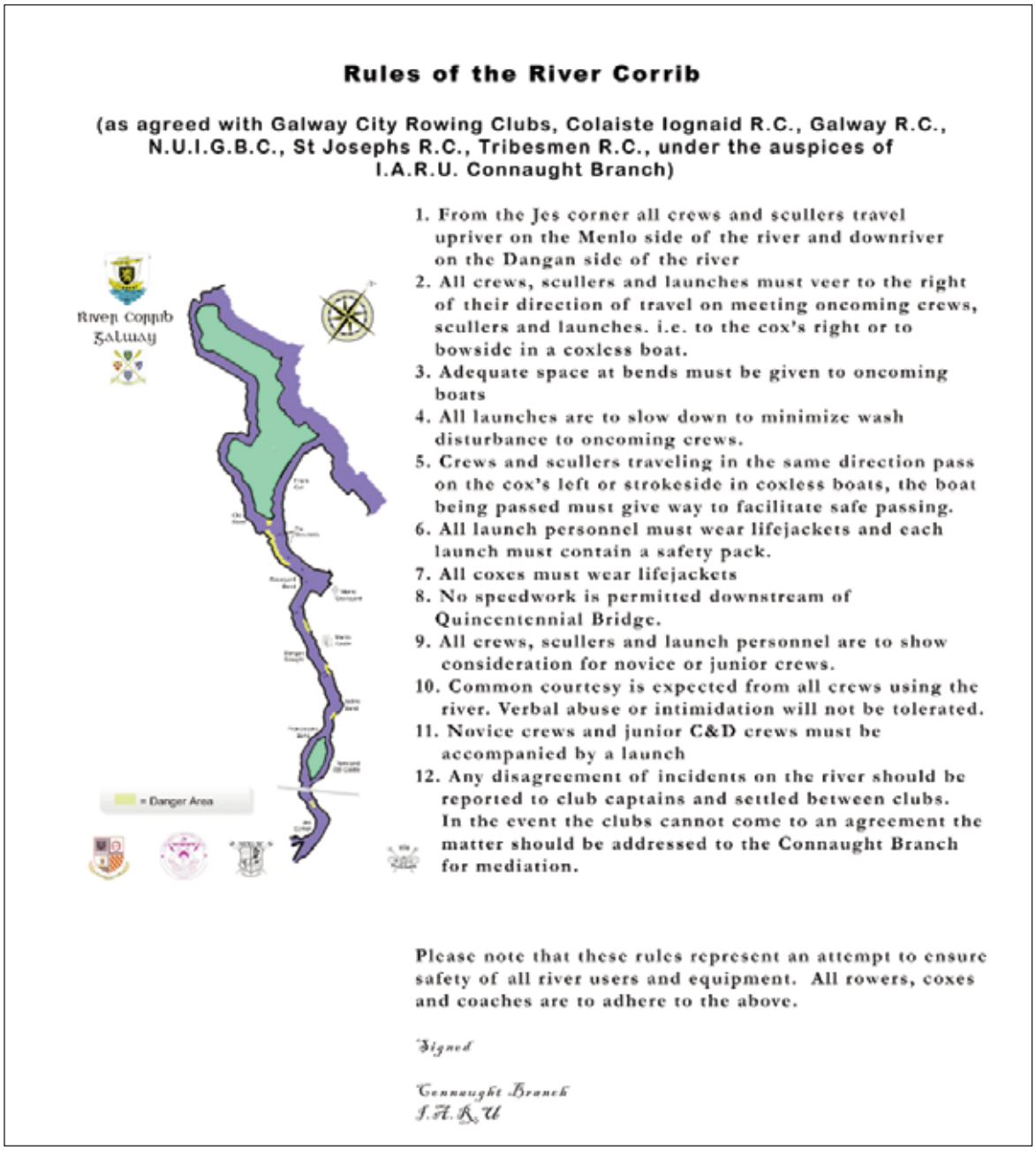
- Managing incidents and medical emergencies, including how to: communicate with other vessels; summon assistance; manage a medical condition afloat; recover an injured person into a safety boat; secure a casualty when underway; and search for a missing person or a missing boat.

2.12.9 The University of Galway Boat Club's coach who oversaw this rowing trip had not received the training or qualifications of the National Powerboat Certificate or the Safety Boat Certificate. Similarly, the Coláiste Iognáid Rowing Club's coach who oversaw their rowing trip had not received the training or qualifications of the National Powerboat Certificate or the Safety Boat Certificate.

2.12.10 The subject of coach training and its relevance to this marine casualty event are analysed in Sections 4.3, 4.4 and 4.10 of this report.

2.13 The Rules of the River

2.13.1 The rowing clubs operating on the River Corrib, in conjunction with Rowing Ireland's regional branch, developed the 'Rules of the River' in or around 2001 to assist with controlling rowing activities and interactions between rowing boats on the river. See Figure 24. These rules have remained unmodified since then.



Rules of the River Corrib

(as agreed with Galway City Rowing Clubs, Colaiste Iognaid R.C., Galway R.C., N.U.I.G.B.C., St Josephs R.C., Tribesmen R.C., under the auspices of I.A.R.U. Connaught Branch)

River Corrib
Galway

= Danger Area

1. From the Jes corner all crews and scullers travel upriver on the Menlo side of the river and downriver on the Dangan side of the river
2. All crews, scullers and launches must veer to the right of their direction of travel on meeting oncoming crews, scullers and launches. i.e. to the cox's right or to bowside in a coxless boat.
3. Adequate space at bends must be given to oncoming boats
4. All launches are to slow down to minimize wash disturbance to oncoming crews.
5. Crews and scullers traveling in the same direction pass on the cox's left or strokeside in coxless boats, the boat being passed must give way to facilitate safe passing.
6. All launch personnel must wear lifejackets and each launch must contain a safety pack.
7. All coxes must wear lifejackets
8. No speedwork is permitted downstream of Quincentennial Bridge.
9. All crews, scullers and launch personnel are to show consideration for novice or junior crews.
10. Common courtesy is expected from all crews using the river. Verbal abuse or intimidation will not be tolerated.
11. Novice crews and junior C&D crews must be accompanied by a launch
12. Any disagreement of incidents on the river should be reported to club captains and settled between clubs. In the event the clubs cannot come to an agreement the matter should be addressed to the Connaught Branch for mediation.

Please note that these rules represent an attempt to ensure safety of all river users and equipment. All rowers, coxes and coaches are to adhere to the above.

Signed

Connaught Branch
I.A.R.U

Figure 24: The 'Rules of the River' agreed by rowing clubs operating in Galway City. Source: https://tribesrowing.ie/wp-content/uploads/2019/02/SafetyOption-river-rules-n-map.pdf

2.13.2 The Rules of the River state that:

- When downstream of Quincentennial Bridge: Crews with a clubhouse located on river's west side[33] proceed upstream along the west side. Crews with a clubhouse located on the river's east[34] side proceed upstream along the east side.

33. In the Rules of the River, the west side is referred to as the Dangan side.
34. In the Rules of the River, the east side is referred to as the Menlo side.

- When upstream of Quincentennial Bridge: All crews proceed upstream along the east side and downstream along the west side. Therefore, departing crews from a clubhouse on the east side simply proceed on upstream, whereas crews departing from a clubhouse on the west side must cross the river before they can proceed on upstream.

2.13.3 The Rules of the River mean that, in the 500 m long section of river between the Salmon Weir and Quincentennial Bridge, it is likely that a crew proceeding downstream along the west side of the river will meet another crew in their path, proceeding upstream along the same west side of the river. This is managed by applying the following rule: Each boat steers to its starboard (right-hand) side. If this is applied correctly, promptly and decisively, the boats will safely pass by one another along their respective port (left-hand) sides.

2.13.4 The Rules of the River identify six Danger Areas, highlighted in yellow on the map of the rowing clubs' area of operation. These designated Danger Areas do not include the Salmon Weir, its upstream safety booms, or the short length of river around the 'Jes corner' bend in the river upstream of the weir. This conflicts with the descriptions provided to the MCIB, which indicated that the rowing clubs were aware that the Salmon Weir, safety booms, and length of river after the Jes corner were a Danger Area and that all rowing crews needed to exercise particular caution when operating in this area.

2.13.5 The subject of the Rules of the River and its relevance to this marine casualty event are analysed in Section 4.5 of this report.

2.14 The Casualty Event

2.14.1 The rowing trip during which this casualty event occurred involved two rowing boats crewed by novice rowers with approximately four months' experience, and a coach's launch boat, all from the University of Galway Boat Club. These rowers had spent that Saturday morning rigging the boats and getting the equipment ready to use again, after returning with their rowing boats from a training camp located outside of Ireland. After rigging was complete, the coach asked the group if they wanted to go out rowing on the water or if they wanted to go to the gym to use the rowing machines. The rowers said they wanted to go rowing on the water. The coach described how she was aware that the group's skills had developed during the training camp, so she made the decision to take them out on the water.

2.14.2 The coach had checked the weather forecast using an app on her phone. She cannot recall what the forecasted wind speed was. She did not record in a log book or similar what the forecasted wind speed or conditions were. She checked with one of the club's other coaches who had been out on the river with a senior crew earlier that morning, and he told her that the conditions upriver were fine. She did not complete a written risk assessment process for this trip.

2.14.3 The rowing trip involved the following six landmarks on the river (See Figures 25 – 27):

1. University of Galway Boat Club's boathouse	4. The weir's safety booms
2. The Eglinton Canal	5. The Jes corner
3. The Salmon Weir	6. The Quincentennial Bridge

Figure 25: Aerial overview of section of river where this casualty event occurred.
Image Source: Google Earth.

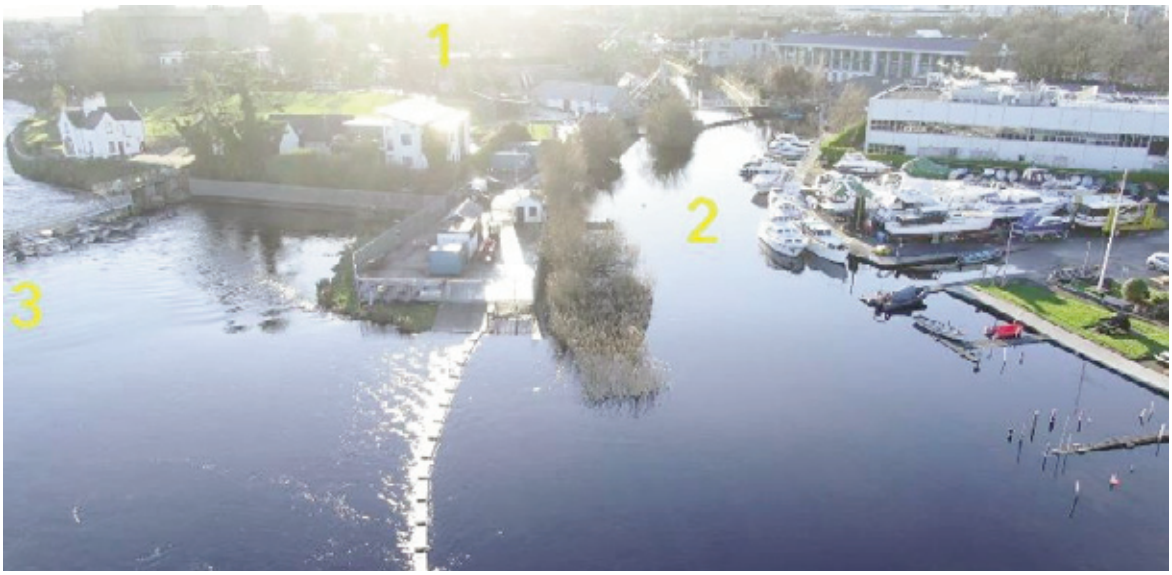


Figure 26: Aerial overview of part of section of river where this casualty event occurred.
Image Source: Galway Aerial Cinematography.

Figure 27: Aerial overview of part of section of river where this casualty event occurred. Viewed looking north, showing: 2. The Eglinton Canal; 3. The Salmon Weir; 4. The weir's safety booms; 5. The Jes corner; 6. Quincentennial Bridge. Note: University of Galway Boat Club's boathouse (1) is out of view, to the south of Eglinton Canal (2).
Source: Galway Aerial Cinematography.

2.14.4 The initial part of their trip involved the University of Galway Boat Club's crews:

- Launching from the University of Galway Boat Club's boathouse (1) and progressing in a northerly direction up against the flow on the Eglinton Canal (2).
- Progressing further on up along the river, staying close to the river's west bank and following the bend in the river around the Jes corner (5).
- Crossing the river to the east side. Progressing upriver along the straight between the Jes corner (5) and the Quincentennial Bridge (6).
- Progressing on up the river along its east side towards its source at Lough Corrib, before turning around and returning back downriver along its west side.

2.14.5 The final part of their trip involved University of Galway Boat Club's crews:

- Passing under Quincentennial Bridge (6) and continuing on downstream alongside the river's west bank.
- Encountering another rowing boat and its coach's boat at a position just upstream[35] of the Jes corner. These were vessels from Coláiste Iognáid Rowing

35. The exact position at which this encounter occurred varied in the recollections of those who described it to the MCIB.

Club. These vessels were also close in to the river's west bank, as they had just turned the corner from their clubhouse but had not yet commenced their crossing over to the other side of the river.

- Manoeuvring their boats to try and safely pass by the approaching boats.

2.14.6 The Rules of the River required of all crews that they each steer their boats towards their respective starboard (right-hand) sides, so that the approaching boats passed each other along their respective port (left-hand) sides. If this procedure had been followed, the boats from the University of Galway Boat Club should have remained in close to the west bank, while the boats from Coláiste Iognáid Rowing Club should have steered out towards the centre of the river.

2.14.7 The descriptions of the actions taken by the vessels from the two rowing clubs are described in Section 3 of this report. Closed Circuit TV (CCTV) footage demonstrates that, as the University of Galway Boat Club's boats rounded the Jes corner moments after passing by the other club's boats, the University of Galway Boat Club's boats were out near the centre of the river, not in close to the west bank as intended by the Rules of the River. As they rounded the Jes corner, the University of Galway Boat Club's coach's launch was first, followed by Boat 1 (the Coxed Quadruple) and then Boat 2 (the Coxed Four).

Closed Circuit TV Footage

2.14.8 A CCTV security camera was located on the west bank, within the grounds of Corrib Rowing and Yachting Club (CRYC), almost directly across from the old railway piers and their attached safety booms (4). See Figure 28. The CCTV camera recorded events in the moments immediately prior to the casualty event and parts of the subsequent rescue efforts. The footage commenced at timestamp 12:02:00.

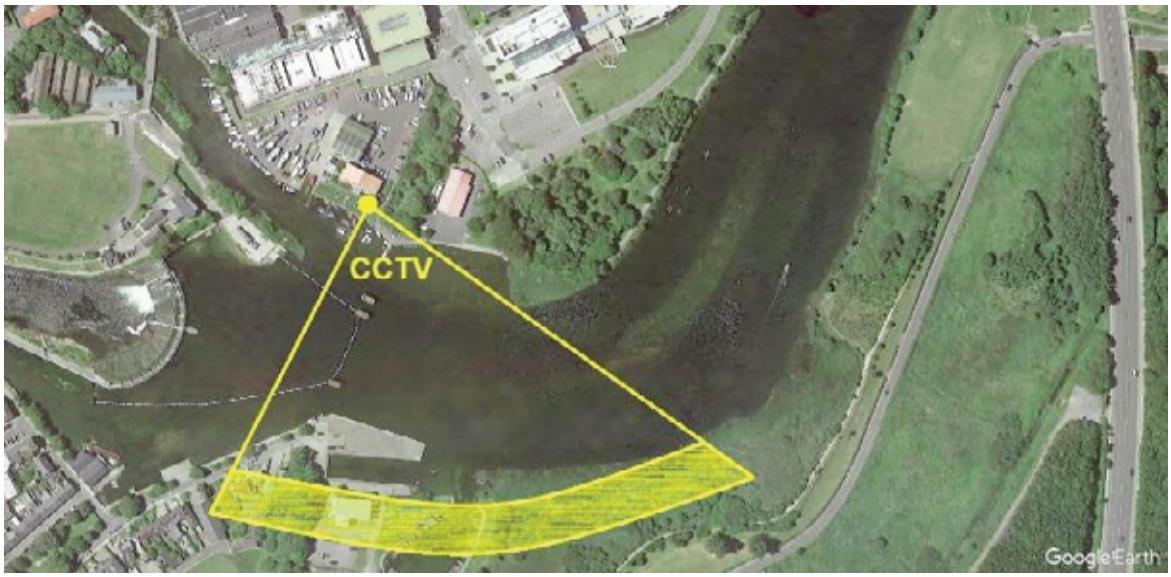


Figure 28: The position and viewing angle of the CCTV camera.
Image Source: Google Earth

2.14.9 **Time stamp 12:02:00** – The coach's launch boat is ahead of the group, followed by Boat 1 and then Boat 2. The trees in leaf are swaying in the wind. Gusts of wind are visible across the water surface, blowing in a westerly direction (from the bank out across the river towards the opposite side). See Figure 29.

Figure 29: CCTV still image at time stamp 12:02:00, showing the respective positions of the vessels from the University of Galway Boat Club. Source: CRYC

2.14.10 **Time stamp 12:02:17** – 17 seconds has elapsed. The coach's launch proceeded downstream of the old railway piers while Boat 1 and Boat 2 continued on their downstream course towards the piers' safety booms. The swaying trees and wind gusts continue. The rowing boats are on a direct course for the safety booms but the crews are not taking effective action to divert their course. See Figure 30.

Figure 30: CCTV still image at time stamp 12:02:07, showing how the coach's launch downstream of the safety booms while the two rowing boats continued on their course towards the safety booms Source: CRYC

2.14.11 **Time stamp 12:02:29** – A further 12 seconds has elapsed. The coach realised the impending situation and turned her launch boat to progress back upstream. Boat 1 and Boat 2 continued on their downstream course but the crews are not taking effective action to divert their course. See Figure 31.

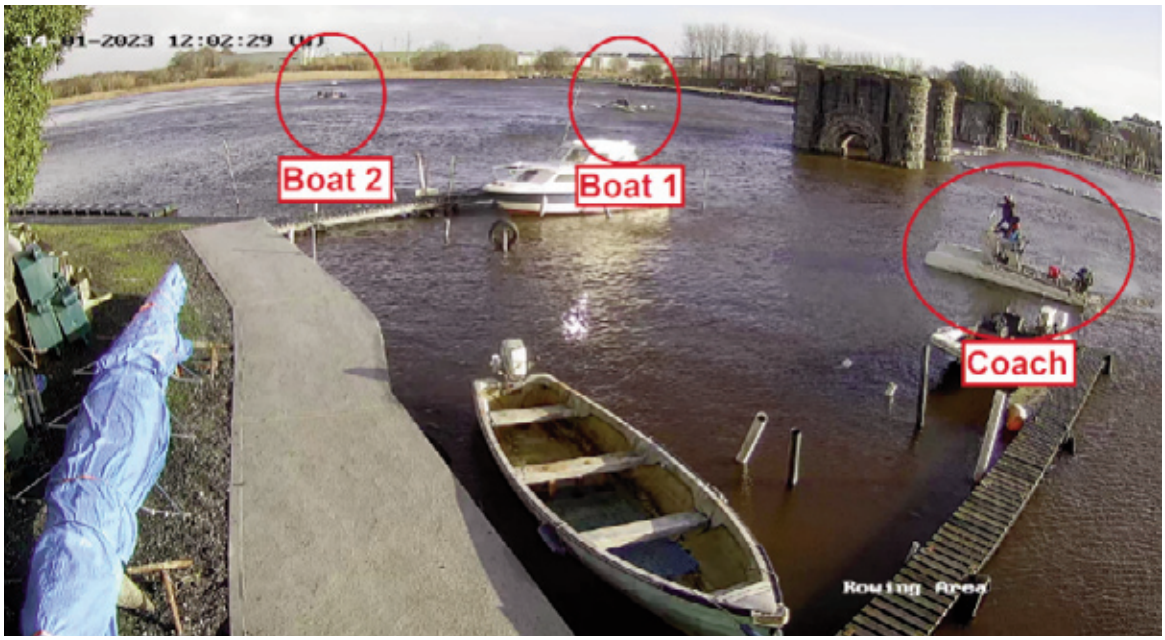


Figure 31: CCTV still image from time stamp 12:02:29, showing how the coach had realised the impending situation and had turned her launch boat to progress back upstream. Source: CRYC

2.14.12 **Time stamp 12:02:38** – A further seven seconds has elapsed. The coach has returned to a position upstream of the old railway piers. Boat 1 has started to turn right towards the west bank but has progressed too far downstream to be able to bypass the old railway piers. Boat 2 has continued its downstream course. See Figure 32.

Figure 32: CCTV still image from time stamp 12:02:39. Source: CRYC

2.14.13 **Time stamp 12:03:03** – A further 25 seconds has elapsed. Boat 1 has passed behind the old railway piers and is about to imminently allide with the safety booms, out of camera view. The coach has approached Boat 1 but starts to turn to manoeuvre back upstream. Boat 2 has continued its downstream course and has started to turn right towards the west bank but has progressed too far downstream to be able to bypass the old railway piers. See Figure 33.

Figure 33: CCTV still image from time stamp 12:03:03. Source: CRYC

2.14.14 **Time stamp 12:03:52** – A further 49 seconds has elapsed. Boat 1 and Boat 2 have allided with the safety booms. The coach's boat remains in a holding position upstream of the old railway piers. A launch boat containing two persons motors towards the scene from the direction of Coláiste Iognáid Rowing Club to start the process of removing crews to shore. The wind gusts continue. See Figure 34.

Figure 34: CCTV still image from time stamp 12:03:52. Source: CRYC

2.14.15 A member of the public on the east bank took a photo of the scene, showing the two rowing boats and their crews on and against the safety booms, while a coach's Tinny launch boat from another rowing club approaches them. See Figure 35.

Figure 35: Contemporaneous photo of the casualty event. Source: Connacht Tribune

2.14.16 **Time stamp 12:14:04** – 12 minutes four seconds has elapsed. The coach's launch boat remains in a holding position upstream of the old railway piers. The wind gusts continue. The rescue of the crews by two Tinny launch boats continues, as they take some of the rescued crews towards Coláiste Iognáid Rowing Club. The coach's Tinny boat from the Coláiste Iognáid Rowing Club, containing the crew from the capsized Octuple, arrives from upstream along the east bank and motors across the river back towards their clubhouse. See Figure 36.

Figure 36: CCTV still image from time stamp 12:14:04. Source: CRYC

2.14.17 **Time stamp 12:19:40** – 17 minutes 40 seconds has elapsed. The final crewmember is removed from the safety booms to the shore.

2.14.18 **Time stamp 12:20:57** – 18 minutes 57 seconds has elapsed. Two Tinny launch boats motor upstream along the east bank, returning two minutes later.

2.14.19 **Time stamp 12:23:01** – 21 minutes 1 second has elapsed. Three Fire and Rescue Service vehicles arrive at the quay on the east side.

2.14.20 **Time stamp 12:28:15** – 26 minutes 15 seconds has elapsed. Two Tinny launch boats motor upstream along the east bank and appear to be manoeuvring around the reeds along the river's east bank just beyond the camera's line of sight. One boat returns towards Coláiste Iognáid Rowing Club after two minutes, while the other remains out of view.

2.14.21 **Time stamp 12:40:43** – 40 minutes 43 seconds has elapsed. Footage ends.

2.14.22 Approximately 16 minutes elapsed between the first boat's allision with the safety booms and the final crewmember being removed from the safety booms to shore.

2.14.23 Aerial images of the site from the following day showed the remnants of Boat 1 caught on the safety booms (See Figures 37 and 38), and that oars and remnants of Boat 2 had washed downstream and had caught on the chains immediately above the weir (See Figures 39 and 40).

2.14.24 The subject of trip planning by the University of Galway Boat Club and its relevance to this marine casualty event are analysed in Section 4.9 of this report.

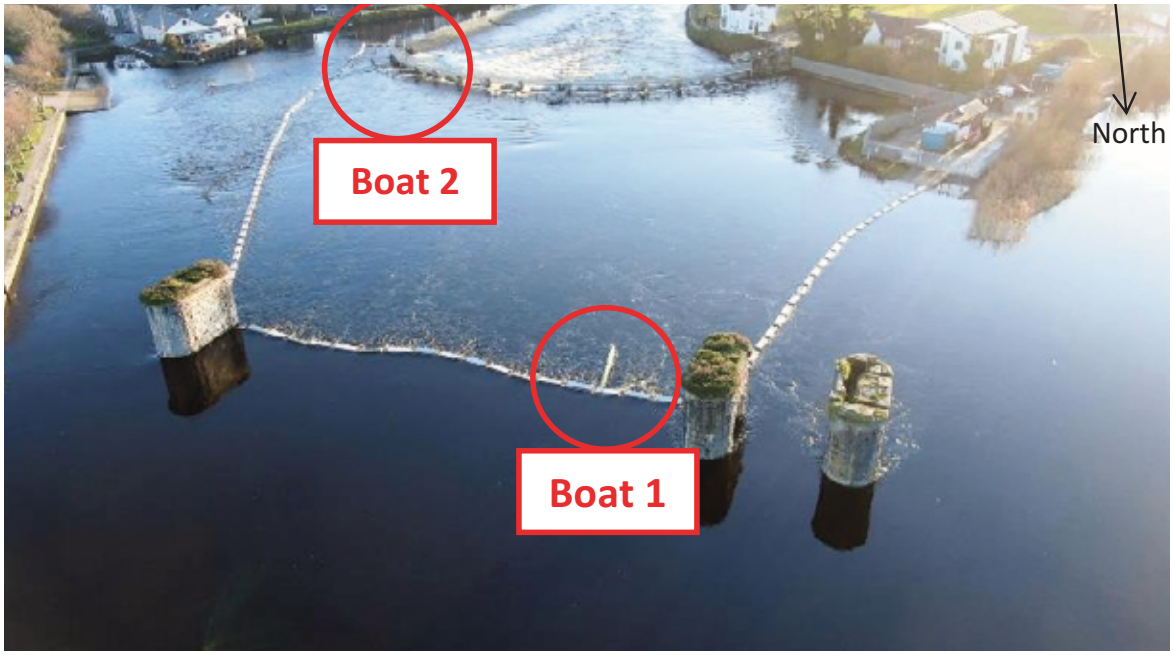


Figure 37: Aerial overview of the river on the day after this casualty event, highlighting part of Boat 1 on the safety booms and Boat 2 on the chains immediately above the weir. Source: Galway Aerial Cinematography

Figure 38: Part of Boat 1 on the safety booms above the weir.
Source: Joe Shaughnessy/Connacht Tribune

Figure 39: Boat 2 on the chains immediately above the weir.
Source: Galway Aerial Cinematography

Figure 40: Oars from this casualty event on the chains immediately above the weir.
Source: Joe Shaughnessy/Connacht Tribune

2.15 The Emergency Services Response

2.15.1 The Marine Rescue Sub-Centre (MRSC) at Valentia co-ordinated a multi-agency emergency response, involving land, sea and air resources from the Irish Coast Guard (IRCG), the National Emergency Operations Centre (NEOC), Galway Fire & Rescue Service (GFRS), the National Ambulance Service (NAS), An Garda Síochána

(AGS) and the Royal National Lifeboat Institution (RNLI), comprising five GFRS vehicles, two AGS cars, the NAS's ambulance and an Advanced Paramedic car, an IRCG helicopter, and the RNLI's lifeboat positioned downriver where the river discharges into the sea at Galway Bay. The speed of response was prompt. The persons in the water were removed to the shore by other rowing clubs' vessels operating nearby to the scene.

2.15.2 The IRCG's Sitrep provides the following summary of the emergency services' response:

12.08 hrs A member of the public makes a 999 call about rowing crews in difficulty and people in the water at the Salmon Weir, Galway city. The call is received at MRSC Valentia. The member of the public describes having a restricted view from their position of what is happening, and that: there are people and two rowing boats stuck on the safety booms above the weir; four rowing club launches are trying to help; two people have been taken from the water, others are hanging onto a boat in the water; no lifejackets. The person who made this call then stated that their phone's battery is about to die.

12.12 hrs MRSC Valentia notifies the Fire Services' Western Regional Control Centre.

12.16 hrs MRSC Valentia requests the attendance of R118 helicopter.

12.18 hrs R118 helicopter is tasked and prepares to respond.

12.21 hrs MRSC Valentia notifies AGS.

12.23 hrs MRSC Valentia notifies Galway Bay RNLI.

12.24 hrs MRSC Valentia contacts the member of the public who made initial contact for an update and is told that: there are three rowing boats involved; there are ten people at the weir and eight people further up the river; I am sure everyone is out of the water; the people taken from the water do not require immediate medical assistance, but they are cold and in shock.

12.26 hrs MRSC Valentia requests stand down of R118 helicopter on the basis that everyone is out of the water.

12.28 hrs MRSC Valentia is notified by AGS Control that all casualties are out of the water.

12.29 hrs MRSC Valentia notifies NEOC that all casualties are out of the water.

12.56 hrs MRSC Valentia is notified by the NEOC that there are reports of two missing persons.

12.57 hrs MRSC Valentia requests the attendance of R118 helicopter.

13.02 hrs MRSC Valentia contacts the member of the public who made initial contact for an update and is told that: as far as I know everyone is accounted for. three different rowing clubs were involved but I am not a member of these rowing clubs.

13.02 hrs MRSC Valentia requests the attendance of a search team from IRCG's Costelloe Bay Unit.

13.05 hrs MRSC Valentia is notified by the NEOC that all persons are accounted for. Stand down.

13.06 hrs MRSC Valentia requests stand down of IRCG's Costelloe Bay Unit.

13.06 hrs MRSC Valentia requests stand down of Galway Bay RNLI.

2.15.3 A representative of the NAS[36] who was on-scene during this casualty event provided the following additional background information in relation to the emergency services' response.

- The NAS had resources in attendance on both sides of the river. He was initially tasked to attend at the University of Galway Boat Club, on the river's west side. He later travelled over to river's opposite, east side.
- He initially understood that there were nine persons in the water, then he was told it was ten persons. He was told that persons had exited the water on both sides of the river. It was only after the incident ended that he learned that there had been more people than this in the water. When the incident was ongoing he had encountered significant difficulty with establishing exactly how many people had entered the water and exactly where they were.
- As the incident progressed, he was told that two females were still unaccounted for. He was told the first names of these two females. There was a genuine sense of concern and fear for the safety of these two females.
- The scene was difficult to manage. Persons who had entered the water had then left the area to shower and change clothes. While this was occurring he was notified that these two females were unaccounted for. This information was relayed back to the NEOC.
- He then travelled to the opposite, east side of the river. He observed three rowing boats in the water. Two were upside down and caught on the safety booms above the weir. The third was further up river and was also upside down.

36. The NAS's Operation Resource Manager for Galway, in communications with the MCIB.

- He was given the phone number for a person responsible for the University of Galway Boat Club. He spoke with this person at approximately 13.10 hrs and was told that all persons were confirmed to be accounted for. He updated the NEOC. At 13.32 hours he stood down from the incident.

2.15.4 Downstream of where this casualty event occurred, the only emergency services' boat stationed on the water is the RNLI's voluntary B-Class rigid inflatable lifeboat in Galway docks – at the confluence of the River Corrib and the sea – which is therefore only available to provide rescue and recovery of persons who have already been carried by the river down through the city. Upstream of where this casualty event occurred, the only emergency services' boat stationed on the water is the Corrib Mask Search and Rescue voluntary service in Lisloughrey, Co. Mayo, approximately 42 km or one hour travel time by water to the Salmon Weir in Galway city. In response to this casualty event, plans have been progressed within Galway city for a specialist D-Class rescue craft to be located on the water immediately upstream of the Salmon Weir, accessible by GFRS.

2.16 Previous Incidents

2.16.1 The MCIB has learnt from various local and published sources of at least five previous incidents involving recreational boats in distress at or above the Salmon Weir. Other, similar, unreported incidents are likely to have occurred.

- In September 2022, a recreational powerboat grounded on a silt bank while attempting to manoeuvre away from the safety booms. The boat was towed off by other powerboats.

- In November 2019[37], a four-person rowing boat allided with the safety booms upstream of the weir. The crew was rescued by members of another rowing club.

- Approximately five years ago, in early winter, a rowing boat containing eight rowers allided with the safety booms upstream of the weir. The crew was rescued by a powerboat from a local rowing club, but the conditions were deemed to be too dangerous to attempt to retrieve the rowing boat, so it was left in place on the safety booms until the river's flow rate subsided at the end of winter.

- Approximately ten years ago, during a competitive rowing race, a rowing boat allided with the safety booms upstream of the weir. The crew was rescued by a powerboat from one of the local rowing clubs.

- Approximately 20 years ago, on the morning of Christmas Day, a rowing boat containing two persons allided with the safety booms upstream of the weir. The crew was rescued by a powerboat from one of the local rowing clubs.

37. www.facebook.com/loughcorribireland/posts/the-weir-is-dangerousplease-take-care-on-the-water-especially-in-front-of-the-we/2148092105290272/

- 41 years ago, in November 1982[38], before the safety booms were in place above the weir, a rowing boat capsized in strong winds and high flow near the old railway pillars. The crew and boat drifted onto the safety chains immediately above the weir. See Figures 41 and 42. Two coach's boats that were effecting rescue then capsized, resulting in a total of 12 persons in the water. All were eventually saved after being rescued. This incident led to the installation of the safety booms that are currently in place above the weir.

Figure 41: The November 1982 incident. Source: Rowing Ireland Connaught Branch

38. www.facebook.com/groups/1227931027221184/posts/5415574441790134

Figure 42: The November 1982 incident. Source: Rowing Ireland Connaught Branch

2.17 The Use of Personal Flotation Devices

2.17.1 From the University of Galway Boat Club, whose two rowing boats allided with the safety booms: none of the rowers in the two rowing boats involved in this casualty event were wearing a PFD, nor were they required by legislation to do so; the coxswain seated in the front of rowing Boat 1 was not wearing a PFD; the coxswain seated in the front of rowing Boat 2 was not wearing a PFD; the coach who was overseeing this rowing session from a launch boat was not wearing a PFD; the novice rower who as a passenger in the coach's launch boat wore a PFD; the coach's launch boat did not contain any PFDs for use by the crews in the event of an emergency.

2.17.2 From the Coláiste Iognáid Rowing Club, whose nine-person Coxed Octuple capsized at approximately the same time as the casualty event on the weir: none of the rowers in this rowing boat were wearing a PFD, nor were they required by legislation[39] to do so; the coach and assistant coach who were overseeing this rowing session from a launch boat each wore a buoyancy aid/PFD; the coach's launch boat contained only three PFDs for use in the event of an emergency.

2.17.3 A person going afloat in a recreational craft operated in Irish waters has statutory[40] obligations in relation to the wearing of a PFD, applying to: any person

39. S.I. No. 921 of 2005 (as amended). The *Pleasure Craft (Personal Flotation Devices and Operation) (Safety) Regulations,* 2005. https://www.irishstatutebook.ie/eli/2005/si/921/made/en/print#:~:text=(1)%20A%20person%20on%20a,the%20shore%20or%20at%20anchor

40. S.I. No. 56 of 2019, *Water Safety Ireland (Establishment) Order 2019.*
Source: https://www.irishstatutebook.ie/eli/2019/si/56/made/en/print

onboard a recreational craft, or any person being towed by a recreational craft whether the person is on an object of any kind, or not. Of particular relevance to this casualty event is Regulation 3 which describes how:

"(1) These Regulations apply to pleasure craft being operated in Irish waters and to—

(a) any person on board such craft, and

(b) any person being towed by such craft or on board a vessel or object of any kind, being towed by such craft.

(2) These Regulations (other than Regulations 8 and 9 do not apply to a pleasure craft being used for rescue or other emergency purposes or for law enforcement purposes.

(3) These Regulations (other than Regulations 8 and 9) do not apply to rowers in boats which are—

(a) designed and specifically used for rowing in boat races and which are capable of being entered into regattas or other events recognised by the Irish Amateur Rowing Union, and

(b) of a design and type in respect of which events are held in the Olympic Games or other international rowing regattas."
[Emphasis Added]

2.17.4 The subject of PDFs and their relevance to this marine casualty event are analysed in Section 4.9 of this report.

2.18 Water Safety Regime in Ireland

Water Safety Ireland

2.18.1 Water Safety Ireland is a statutory body[40] that was established in 2019 under the aegis of the Department of Rural and Community Development. Its statutory role includes the promotion of both public awareness of water safety and measures to prevent accidents in water, and is defined in legislation as involving the following:

"4. (1) The Body shall provide the following services for or on behalf of the Minister:

(a) the promotion of public awareness of water safety;

(b) the promotion of measures, including the advancement of education, related to the prevention of accidents in water;

(c) the provision of instruction in water safety, rescue, swimming, resuscitation and recovery drills;

(d) the promotion of efficiency of the service provided by lifeguards, including enhancing the standard of lifesaving through the promotion and development of lifesaving to international standards;

(e) the establishment of, and provision of training in, national standards for lifeguards, lifesaving and water safety;

(f) the provision of instruction, training, assessment and certification in aquatic rescue for boat crews of independent voluntary community organisations for the time being known as the "Community Rescue Boats Service" and other organisations involved in aquatic rescue."

2.18.2 Water Safety Ireland's website[41] has safety guidance for general boating activities that states:

1. *"Check condition of boat and equipment, hull, engine, fuel, tools, torch.*
2. *Check the weather forecast for the area.*
3. *Check locally concerning dangerous currents, strong tides.*
4. *Do not drink alcohol while setting out or during your trip.*
5. *Carry an alternative means of propulsion e.g. sails and oars or motor and oars.*
6. *Carry a first aid kit on board and distress signals (at least two parachute distress rockets, two red hand flares).*
7. *Carry a fire extinguisher, a hand bailer or bucket with lanyard and an anchor with rope attached.*
8. *Carry marine radio or some means of communication with shore.*
9. *Do not overload the boat – this will make it unstable.*
10. *Do not set out unless accompanied by an experienced person.*
11. *Leave details of your planned trip with someone ashore – including departure and arrival times, description of boat, names of persons on board, etc.*
12. *Wear a lifejacket at all times.*
13. *Keep an eye on the weather – seek shelter in good time.*

41. www.watersafety.ie/boating

14. In Marine Emergencies, call 999 or 112 and ask for the coast guard."

The Department of Transport, the Code of Practice and Marine Notices

2.18.3 The Department of Transport's approach to the safety of recreational craft is described in the Irish Maritime Directorate Strategy 2021 – 2025 and includes work on policy development, statutory regulation, safety awareness promotion and enforcement.

2.18.4 Marine Notices (MN) are information notices issued by the Department of Transport to publicise important safety, regulatory and other information relating to the maritime sector in Ireland. All MNs are published and catalogued online[42] and are issued by email directly to those who subscribe to the relevant mailing list. MNs that relate to the use of recreational craft are specifically addressed to the owners and operators of such craft. All MNs provide contact details for persons seeking further technical assistance on the subjects raised.

2.18.5 Table 1 lists the recently published MNs that particularly relate to issues raised in this investigation report, including two MNs issued following publication of the MCIB's investigation report[43] MCIB/286 following the capsize of an Olympic style rowing boat during a training session near the Salmon Weir in Limerick on the 23 February 2019:

Table 1: Marine Notices related to the issues raised in this investigation report

Number	Date Published	Subject
No. 42 of 2022	15-Jun-22	Important safety advice for those involved in Rowing[44]
No. 40 of 2021	25-Jun-21	Code of Practice for the Safe Operation of Recreational Craft
No. 19 of 2021	01-Apr-21	Importance of Voyage Planning and avoiding dangerous situations in Adverse Weather and Sea Conditions
No. 27 of 2020	21-Jul-20	Code of Practice for the Safe Operation of Recreational Craft
No. 51 of 2019	07-Nov-19	Amendments to the 2017 Edition of the Code of Practice for the Safe Operation of
No. 32 of 2019	29-Aug-19	Personal Flotation Devices for Pleasure Craft and Personal Watercraft

42. www.gov.ie/en/collection/e762fd-marine-notices
43. https://www.mcib.ie/reports.7.html?r=258
44. https://www.gov.ie/pdf/228211/?page=null

2.18.6 The CoP for the Safe Operation of Recreational Craft[45] was published by the Department of Transport, Tourism and Sport in 2017, with updates in 2019. Rowing boats – including competitive rowing boats of the type involved in this casualty event – are recreational craft and the CoP applies to their use. Chapter 8 of the CoP sets out recommendations for rowing boats. On the subject of training, the CoP recommends that rowers undertake appropriate training, including training provided by Rowing Ireland.

See Appendix 7.7 - Code of Practice: The Safe Operation of Recreational Craft.

2.18.7 While not mandatory in terms of legal enforceability, the CoP is an authoritative guidance document that encourages compliance with its safety recommendations. The Department of Transport has commenced a review and updating of the CoP, which remains ongoing.

2.18.8 MN 42 of 2022 (published in June 2022, seven months prior to this casualty event) highlighted the following guidance from the CoP for the Safe Operation of Recreational Craft:

"Safety advice and recommendations

Sections 8.2, 8.3 and 8.4 of the Code of Practice provide a list of important safety recommendations and checks that should be followed. These include the following:

- *Keep all rowing equipment in good order and inspect the equipment regularly.*
- *Prior to a crew embarking, boats should be checked to confirm they are safe, free of leaks and that all moving parts are functioning.*
- *Coaching launches should be on the water at all times when rowing craft are in use.*
- *Unescorted outings are not encouraged and, if undertaken, a designated person ashore should know the departure times, destinations and return times.*
- *All persons should be capable of swimming 100m while wearing light clothing.*
- *All boat coxswains should wear an approved personal flotation device/lifejacket at all times.*

Navigation, hazards and weather

Coaches, coxswains and crew should at all times be aware of local navigation rules, including any possible hazards or potential dangers arising from tidal stream or wind that may prevail locally.

45. www.gov.ie/en/publication/66ff7e-safe-operation-of-recreational-craft

Boats should not be used at night unless they comply with the requirements of the International Collision Regulations regarding navigation lights.

Boats should not be operated in weather or tide conditions that may compromise their low freeboard and stability.

It is important to risk assess local conditions, currents, etc. prior to putting craft into the water. Boats should not be operated in waters that are beyond the capabilities of the crew or the boats concerned.

Be aware of the dangers of hypothermia when wet or exposed to the elements.

Personal flotation devices/lifejackets and other safety equipment

All persons on board any craft of less than 7 metres in length must wear a personal flotation device or a lifejacket.

Where an exemption to this requirement is being applied in the case of rowers in boats designed and specifically used for rowing in boat races and which are capable of being entered into regattas or other events recognised by Rowing Ireland or in the case of rowers in boats of a design and type that are used in the Olympic games or other international rowing regattas, it is most important that a coach and/or safety boat is in attendance at all times and that other safety precautions are followed.

Operators of safety boats should be suitably qualified and boats should be suitably identified by markings or warning flags to alert other craft in the area that there are rowing boats on the water.

Coach/safety boats should at a minimum carry the following items of equipment:

- *Suitable bailer*
- *Suitable inflatable pump - if an inflatable is used as a rescue boat*
- *A throw bag with at least 10m of buoyant line*
- *A sound signalling device - air or aerosol power klaxon*
- *Thermal exposure blankets*
- *Lifebuoys or additional personal flotation devices/lifejackets to assist persons in the water - one for each crew member on the rowing boat*
- *Suitable First Aid Kit*
- *Anchor and line*
- *Knife*

- *Engine Kill Cord to be used by the engine operator*
- *Paddle*
- *Suitable handholds fixed to the side of the boat - to assist persons being rescued.*

Dependable means of communication

It is important to consider and establish effective means of communication, other than by solely using mobile phone technology, for the specific location of the activities to be undertaken."

2.18.9 The guidance aimed at persons undertaking boating, provided by Water Safety Ireland and the Department of Transport, does not include particular guidance on the importance or practice of risk assessment, incorporating the principles of hazard identification, analysis, evaluation and control measures. This subject is addressed in detail in other parts of the maritime sector, such as fishing, diving, ports/docks and offshore mineral exploration. The Health and Safety Authority has risk assessment guidance published specifically for these environments as they relate to workplace settings.

3. NARRATIVE

3.1 Summary of Events

3.1.1 The vessels from University of Galway Boat Club – two rowing boats with a total of ten novice adults and one coach's launch boat with two adults onboard – departed from the club's boathouse at approximately 11.00 hrs on Saturday 14 January 2023. They made their way upstream along Eglinton Canal and then directly onto the River Corrib where the two converge, nearby to the Salmon Weir.

3.1.2 A member of the public on the riverbank, with experience of rowing on the river, saw their progress at this early stage and became concerned about their abilities in the prevailing river and weather conditions. This member of the public shouted to the crews that they should not go up the river, that the flow was too strong. The crews continued on past this point and proceeded on up towards their scheduled turn-around point, approximately 3 km/1.6 nautical mile (NM) upriver. The boats turned around at this point and made their way back downriver.

3.1.3 As the University of Galway Boat Club's boats were nearing the end of their trip, they passed under Quincentennial Bridge and were on approach to the Jes corner further downstream along this straight stretch of river, following a course near to the river's west bank. Ahead of them, further along this straight stretch of river, they observed other boats appear from around the Jes corner that were making their way upriver towards them, also following a course near to the river's west bank. These other boats were from Coláiste Iognáid Rowing Club, consisting of one rowing boat with a crew of nine teenagers and one coach's launch boat with two adults onboard.

3.1.4 The vessels from the two clubs initially continued on their course towards one another. The coaches who were overseeing their clubs' rowing boats were aware that they had to issue instructions to their crews to take action to avoid a potential collision.

3.1.5 In the scenario described above, the Rules of the River required the boats to take the following actions:

- The upstream-going boats from Coláiste Iognáid Rowing Club must steer away from the riverbank (towards the centre of the river), to allow the boats from the University of Galway Boat Club to pass by 'on the inside', close to the riverbank.

- The downstream-going boats from University of Galway Boat Club must steer towards the riverbank, to allow the boats from Coláiste Iognáid Rowing Club to pass by 'on the outside', furthest from the riverbank.

3.1.6 The narratives provided to the MCIB by members of both rowing clubs is that their respective boats all steered away from the riverbank, towards the centre of the river. For the boats from the University of Galway Boat Club, that was contrary to what was required of them by the Rules of the River. The University of Galway Boat Club's coach, whose boat was the lead vessel in their group of three, described their perceived need to do this to prevent a potential collision, as the other club's boats had not diverted course promptly and decisively to avoid a developing situation.

3.1.7 The MCIB's analysis of the available information is that:

- The upstream-going boats from Coláiste Iognáid Rowing Club may have steered away from the riverbank (towards the centre of the river), but the boats from University of Galway Boat Club still passed by incorrectly 'on the outside'.
- The downstream-going boats from University of Galway Boat Club may have steered away from the riverbank (towards the centre of the river), but the boats from Coláiste Iognáid Rowing Club still passed by incorrectly 'on the inside'.

3.1.8 After the boats from the two rowing clubs had passed by one another, they all found themselves out in the river's main flow, away from the river's west bank and its relative shelter from the near-gale force wind that was blowing from the west. Their respective routes are likely to have been similar to what is illustrated in Figure 43.

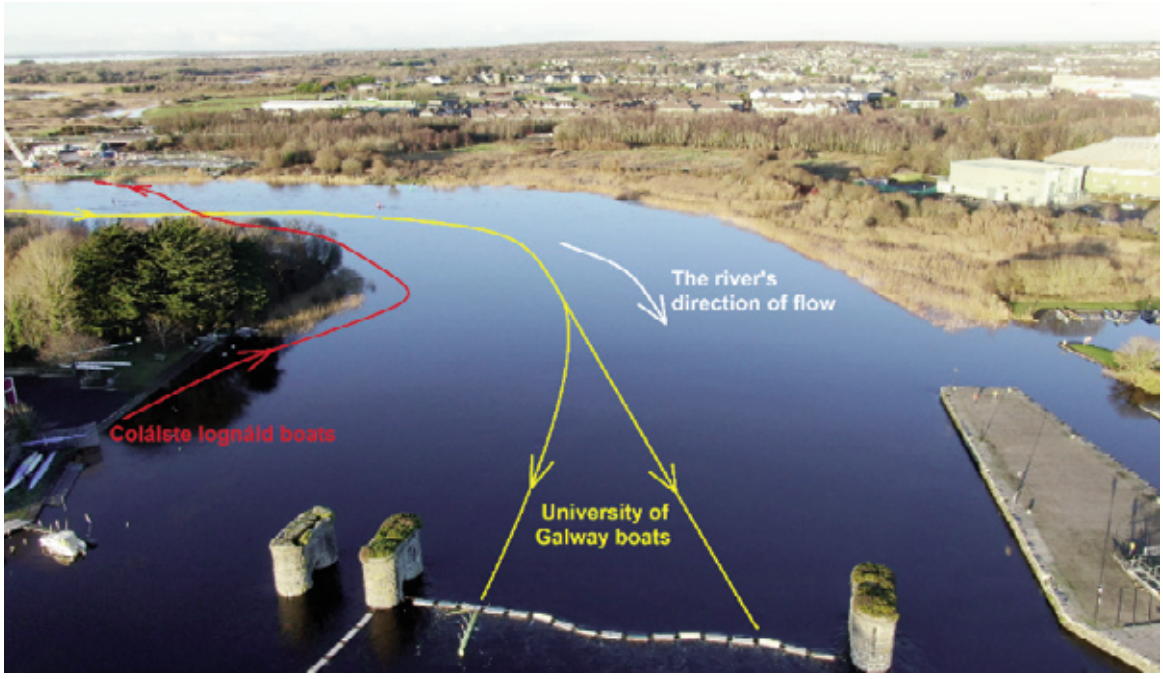


Figure 43: Illustration of the approximate courses followed by the various boats. Source: MCIB Investigation. Image Source: Galway Aerial Cinematography

3.1.9 After the boats from the two rowing clubs had passed by one another, their positioning out in the river's main flow set in motion the following final sequence of events that occurred in the subsequent moments:

- The boats from Coláiste Iognáid Rowing Club crossed the river against the flow, on a course towards the river's east bank; they became more exposed to the effects of the flow and the wind; they capsized in reeds along the east bank.
- The boats from University of Galway Boat Club were conveyed further downriver by the river's fast flow; they became more exposed to the effects of the flow and the wind; they did not alternate course or speed sufficiently to avoid the weir's safety booms directly ahead; they allided with the safety booms and capsized.

3.2 Coláiste Iognáid Rowing Club

3.2.1 The following is an account of events before and after the boats from the two rowing clubs passed one another, provided by the coach from Coláiste Iognáid Rowing Club who was on the water in a coach's launch boat with his club's rowing crew that day.

3.2.2 Coláiste Iognáid Rowing Club's crew was a Coxed Octuple rowing boat operated by a youth crew of teenage children. This is a nine-person rowing boat, including the coxswain who steers the boat.

Trip Planning

3.2.3 The coach described the following actions before embarking on the rowing activity on the 14 January 2023:

- He was aware that the river's flow rate was fast, as all the sluice gates were open.
- He referred to a weather forecasting app on his mobile phone. He did not record what the forecasted conditions were to be, either in writing or by taking an image from what was presented on the screen. In interpreting the weather forecast, his focus was on the forecasted mean wind speed, not the forecasted wind gusts. His focus was on the colour coding used by the weather app, instead of the magnitude of the actual wind speed. If the colour coding indicated blue conditions (of up to 19 km per hour/10 kts) or green conditions (of up to 29 km per hour/16 kts) then he interpreted this as meaning wind conditions suitable for rowing. He accepted that this interpretation of the forecasted wind conditions omitted reference to the effects of the wind gusts that, by definition, are greater than those of the mean wind speed.

- He consulted with another rowing coach who had taken a rowing crew upriver earlier that morning, who told him that the wind conditions upriver had been ok.

- He took a coach's launch boat and went upriver to check on the conditions up there, before deciding to go afloat. This was the normal practice in the club, especially on days when there was uncertainty about the wind conditions.

- At the clubhouse slipway before launching, he had briefed his crew on what to do in the event of a capsize. He described to them how they must climb out of the water up onto the top of the upturned boat. He felt the need to brief the crew again on this normal procedure because he was aware of the increased risks associated with a capsize occurring on this outing.

The Journey Upriver

3.2.4 The two crews arrived at Coláiste Iognáid Rowing Club at 11.00 hrs. The first rowing boat set off with its accompanying coach's boat. The second rowing boat that was being overseen by him set off only a few moments later accompanied by him and an assistant in a coach's boat. They all progressed up the river.

3.2.5 His coach's launch boat was positioned just behind his club's rowing boat. He was giving instructions directly to the crew; the coxswain was only responsible for steering the boat in response to his commands.

3.2.6 He knew that it was windy, and that the wind was blowing across the river from the west bank, so he wanted to try and keep his boats in as close as possible to the west bank. But he was aware that this conflicted with the Rules of the River, which required him to allow boats moving downstream to maintain their course immediately alongside the west bank.

3.2.7 His crew rounded the Jes corner by maintaining the one-boat width out from the river's west bank. The purpose of moving away from the riverbank was to ensure that there was space for the possibility of there being another rowing boat proceeding down river in close to this west bank. He was aware that boats progressing upstream were travelling against the flow and therefore had better control over the direction steered by the boat than those progressing downstream.

3.2.8 His crew continued making their way upriver. He noticed that the coxswain controlling his club's rowing boat was struggling to maintain their upstream progress in a straight line, against the flow of water; the flow was pushing the front of their rowing boat from one side to the other, and the boat's coxswain was struggling to counteract this effect with the boat's rudder.

3.2.9 As they progressed further upriver the coach could see that they had come parallel to the first set of navigation buoys, which were to his starboard/right-

hand side. It was in or around this location that the coach decided to abandon the trip. He made this decision because of how strong the wind was and how fast the river was flowing. He was aware that, in order to do this safely, he would need to progress further on upriver as far as Quincentennial Bridge before being able to turn the boats around and return to the clubhouse.

3.2.10 The coach first saw the boats of another rowing club up ahead after he and his crew had rounded the Jes corner. He saw two rowing boats and a coach's launch boat up ahead along the straight part of the river. See Figure 44.

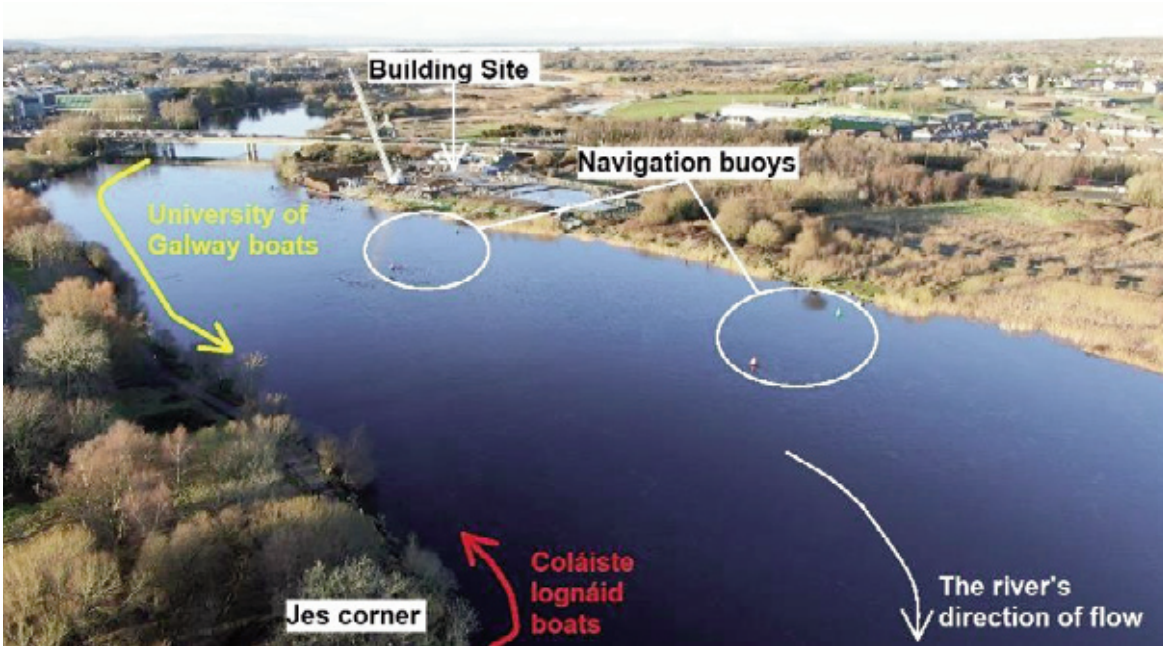


Figure 44: Illustration of the approximate positions and courses of the boats from the two rowing clubs when they were first observed by each other, as described by the Coláiste Iognáid Rowing Club's coach. Source: MCIB Investigation. Image Source: Galway Aerial Cinematography

3.2.11 The Coláiste Iognáid Rowing Club's coach could see that the crews in the two rowing boats had stopped rowing. The impression he had was that those in control of the three boats were novices, as he could see that they were hesitating when he would not have expected this i.e. there was an indecisiveness in their actions.

3.2.12 The coach's recollection of his club's boats passing by the other club's boats is that:

- He issued an instruction to his rowing boat's coxswain to "Go outside", meaning that he wanted their rowing boat to steer towards their starboard (right-hand) side, so that the other club's boats would pass along his port (left-hand) side, thereby allowing the other club's boats to continue on down close to the riverbank. He further instructed the two rowers closest to the stern of their boat to hold their oars into the water to supplement the effect of the rudder, to steer the boat away from the nearby riverbank.

- His club's boats steered towards their starboard (right-hand) side to provide space for the other club's boats. In so doing, this brought his club's boats further out towards the centre of the river.

- His club's boats passed by the other club's boats at a position about halfway between the two navigation buoys.

- He is unsure if the various boats from the two clubs all passed by one another to their respective port (left-hand) sides, in the alignment required by the Rules of the River. He thinks it is possible that one of the other club's boats went on an outside route near the middle of the river, while the other boat stayed close to the river's west bank.

3.2.13 His crew and his launch boat passed by the other boats without incident. There was no clash, no impact, no confrontation, no incident. He simply waved at the passing boats as he progressed on upstream. He was unaware that these two rowing boats went on to be involved in an incident shortly after this, until he came across it later.

The Coláiste Iognáid Rowing Club's Capsize

3.2.14 As Coláiste Iognáid Rowing Club's boats continued further out across the river, away from the river's west bank, they became more exposed to the wind blowing across the river's west bank. It was at this point – out in the main flow – that they experienced a persistent gust of wind coming from the west side of the river. As they were now being blown across to the east side of the river his club's boats continued on this trajectory instead of attempting to steer back in towards the riverbank after the other club's boats had passed by. In so doing, his club's boats therefore crossed over to the river's east bank sooner than he had initially anticipated. His club's boats reached the east side of the river at a position near the second set of navigation buoys.

3.2.15 They made some further progress up the river along the east bank but they capsized in the reeds during wind gusts. The capsize occurred at a position between the navigation buoys and the building site. See Figure 45.

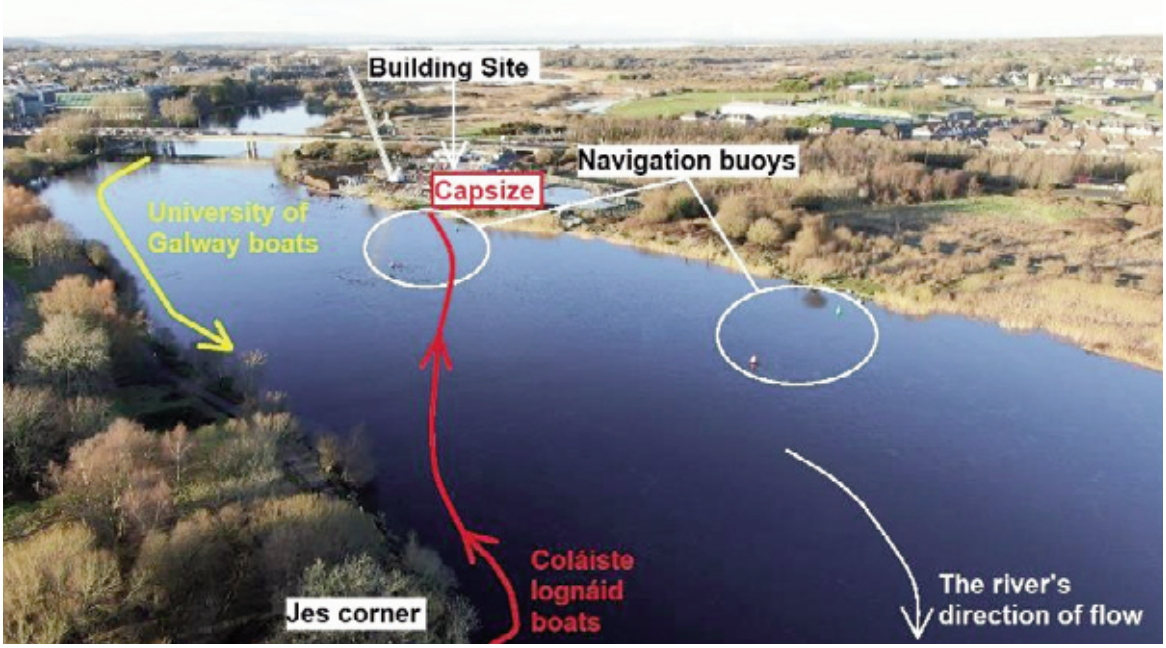


Figure 45: The course taken by the boats from Coláiste Iognáid Rowing Club, as described by their coach. Source: MCIB Investigation. Image Source: Galway Aerial Cinematography

Events after the Coláiste Iognáid Rowing Club's Capsize

3.2.16 When his club's rowing boat capsized, the crew climbed up onto the top of the rowing boat. He positioned his coach's launch boat alongside it, downwind so as not be blown onto the rowing boat. The nine members of the rowing crew moved into his coach's launch boat one-by-one. They sat down on the hull of the coach's boat. He left the capsized rowing boat in the shallow water along the east bank.

3.2.17 The standard procedure in the event of a capsize is to take only two members of a rowing crew at any one time and to transfer them the shortest possible distance to the riverbank, before returning to take the next two persons. The coach deviated from this procedure that day because he felt that the conditions warranted it. He delivered all nine crewmembers back to the club house in one journey; no members of the rowing crew were left back at the rowing boat or on the shore.

3.2.18 The coach took all nine crewmembers back downstream to their clubhouse in his coach's launch. As a result, there were 11 people in this powerboat[46]. As his powerboat contained only three spare PFDs, and as none of the rowing crew had been wearing a PFD during their rowing activity, most of those in the powerboat did not wear a PFD during this trip.

3.2.19 After he arrived back at the clubhouse with his rowing crew, the crew disembarked and he immediately motored over towards the weir to assist in the rescue. He was assisted in this by the coach's assistant who remained in the

46. This powerboat is designed to carry a maximum capacity of 4 persons or 420 kg.

launch boat. They removed people from the safety booms and brought them to shore.

3.2.20 They then motored back upriver to meet the club's other novice rowing boat and coach's boat that had set out on the water with them earlier that day. Those boats had continued on with their rowing session and were now returning back towards the club house. They met them at the bridge and escorted them down the final length of the river, to the club house.

3.2.21 They disembarked from the coach's launch boat and met parents of the rowing crew and spoke with AGS.

3.2.22 The coach then took the coach's launch boat and motored back up river to their capsized rowing boat. He found that this had drifted from where the capsize had occurred and was now in the reeds further down the river, close to the final bend in the river. There was a rescue boat from another rowing club in attendance already and that rescue boat towed the rowing boat back to the club's own club house.

3.3 University of Galway Boat Club

3.3.1 The following is an account provided by the coach who accompanied the University of Galway Boat Club's two rowing boats that day. The following is this coach's account of events before and after the boats from the two rowing clubs passed one another.

3.3.2 The group had returned very recently from a week-long overseas training camp. All of their rowing boats and equipment had been away with them and arrived back at the clubhouse the night before. The group had spent the Saturday morning rigging the boats and getting the equipment ready to use again. After rigging was complete the coach asked the group if they wanted to go out rowing on the water or if they wanted to go to the gym to use the rowing machines. They said they wanted to go rowing. The group's skills had developed during the training camp, so she made the decision to take them out on the water.

3.3.3 The University of Galway Boat Club's coach referred to a weather forecasting app on her mobile phone. She cannot recall what the forecasted wind speed was. She did not record what the forecasted conditions were to be, either in writing or by taking an image from what was presented on the screen. She checked with one of the club's coaches who had been out on the river with a senior crew earlier that morning, and he said the conditions upriver had been gusty on the exposed, straight section of river but were otherwise ok.

3.3.4 The group went afloat in a Coxed Quadruple containing a female crew (five persons in total) and a Coxed Four containing a mixed crew (two males and three females). The eleventh member of the novice group accompanied her in the coach's catamaran boat used by the club.

3.3.5 The coach had been unable to find all of the club's PFDs as they had been packed away with the equipment taken on the training camp. She gave a PFD to the eleventh person who accompanied her on the coach's boat. She was unable to find another PFD so she went afloat without one.

3.3.6 The group departed from the clubhouse on Eglinton Canal and started to make their way upstream to where it meets the River Corrib. They proceeded on upstream along the river, initially along the west bank and around the Jes corner before crossing over to the river's east bank. The river's flow was strong and they made slow progress upstream. They continued on towards the top of the river, eventually arriving at Menlo straights where they turned the boats to commence the return leg. There were a few gusts of wind when they were up on the straights, but nothing remarkable.

3.3.7 They passed under Quincentennial Bridge at about 12.00 hrs. They were close to the river's west bank. She saw there was a rowing boat and a coach's launch boat in front of them, near the Jes corner. It seemed to her that this other group intended to continue on up the river close to its west bank. She was aware that less experienced crews sometimes stay in along the west bank instead of crossing over to the east bank in the normal manner if the flow is too strong for them. These boats did not move out away from the bank to create the space needed for her crews to continue on down the river alongside the riverbank, as required by the Rules of the River.

3.3.8 She told Boat 1 to stop rowing and to wait. This was at a position about half way between Quincentennial Bridge and the Jes corner[47]. She went ahead in the coach's boat. The rowing boat and its coach's launch boat from Coláiste Iognáid Rowing Club were proceeding upriver, separated from each other. She thought there was enough space for her crews to come down between them. She shouted to her club's Boat 1 to continue on down the river, to follow her through the gap between the other club's boats. Boat 1 had drifted downstream quite a lot by then. Her coach's boat was now in the vicinity of the Jes corner.

3.3.9 Boat 1 came downstream, but by the time they reached the Jes corner, they were too far out from where she wanted them to be, in close to the bank. The river's flow carried them further out towards the centre of the river. They got caught in the main flow in the centre of the river. She shouted at them to hold water on one side and row hard on the other side, to try and get them to turn back in towards the west bank. At the same time the wind suddenly picked up and began blowing very strongly. They were being pushed downstream, out in the main flow. They were being swept incredibly quickly towards the safety booms above the weir.

3.3.10 Boat 1 ended up on the safety booms and capsized. The crew managed to get out of the boat and hang onto the booms. At the same time that this was

47. The distance between these two features is approximately 500 m.

happening, she realised that Boat 2 had also proceeded on down the river and was taking the same path, which was too wide of Jes corner. She shouted at Boat 2 to turn in towards the west bank but the wind continued to push them out away from there. They were being pushed towards the opposite side of the river. She tried to get the crew of Boat 2 to row backwards as hard as they could but the current was too strong for them. Boat 2 turned side-on to the river and was pushed onto the safety booms. This all happened very quickly.

3.3.11 There was a lot of activity in the rowing clubs on both sides of the river at that time, with crews having just come in or about to go out. There were coaches from other clubs in Tinny launches out on the water who were able to come straight out to the safety booms to help. The coach's boats from the other clubs got her crews away from where they were hanging onto the safety booms and took them to the shore.

3.3.12 During the rescue the wind was still extremely strong and gusty, blowing downstream onto the safety booms. She noticed in passing that, the rowing boat that had been progressing upriver, which she had passed a few minutes earlier, had crossed over the river and had capsized near the east bank, at a position a few hundred metres further upstream.

3.3.13 She could not go in to help with the rescue of her crews as she knew it was not safe to take the Cat boat she was using in close to the safety booms. There was another Cat boat out on the water from another rowing club, but they also would not go in close to the safety booms for the same reason.

3.3.14 Some of her crews were taken to a rowing clubhouse on the east side. Some of her crews were taken to a rowing clubhouse on the west side, and some of them went back to the college's gym. She landed the Cat boat on the east side and checked on the crew taken to a clubhouse there. She phoned her club's head coach who came down straight away. Her crews were looked after and given dry clothes, blankets, and warm drinks, and were then taken by cars back to their own clubhouse. The emergency services were present; the ambulance service checked that everyone was accounted for, and the crews were interviewed by AGS.

4. ANALYSIS

4.1 The Weather

4.1.1 The University of Galway Boat Club's coach described how she had checked Met Eireann's weather app that morning, before commencing the trip. The coach did not record in a log book or similar what the forecasted conditions were, and she could not recall after the incident what the forecasted conditions had been. However, the script that Met Éireann published on its website, and sent to regional radio stations, was consistent in its warnings that strong, gusty winds were likely. The script for broadcast on regional radio specifically warned that winds of Force 6 to 7 could be expected in Galway Bay. A Small Craft Warning and a Gale Warning – for winds of up to Force 8 – were in effect for coastal areas including Galway Bay. The wind direction was forecasted to be from the west.

4.1.2 Met Éireann has prepared a post-incident weather report with a professional meteorologist's assessment of what the weather conditions are likely to have been in the River Corrib area of Galway city on the day of this casualty event. The air temperature was cold, at 4 – 8°C. The wind was from the west, as forecasted. The wind speed increased from an initial Force 4 in the early morning, increasing to Force 5 or 6, and occasionally Force 7, which is what had been forecasted to occur. There were occasional gusts of up to 45 kts (83 Km/h).

See Appendix 7.2 - Met Éireann (Post-Incident) Weather Report.

4.1.3 The wind conditions – both forecasted and determined by analysis post-incident – match the experiences described by those afloat that day. These conditions exceeded the capabilities of the rowing crews. These conditions were foreseeable prior to departure, using standard trip planning skills.

4.1.4 The skills and importance of both understanding and interpreting weather forecasts form part of the training schemes from the national governing bodies for boating activities, being Rowing Ireland and Irish Sailing. This is analysed further in Section 4.7 of this report.

4.1.5 A number of persons who spoke with the MCIB as part of this investigation referred to their use of weather apps on mobile devices as part of their trip planning procedures. These apps included Met Éireann's app and others provided commercially. One person described how their use of a commercial weather app relied on that app's use of colour coding, in which a green coding was taken as meaning ok conditions i.e. the emphasis was on the colour coding, not the actual wind speed. There was no awareness of the different methodologies involved in the production of these weather forecasts. The MCIB notes that similar issues were raised[48] in Report No. MCIB/304 published in 2021, dealing with a casualty event involving kayakers at Bulloch Harbour in Co. Dublin.

48. Report No. MCIB/304 www.mcib.ie/reports.7.html?r=293

4.1.6 As described in Report No. MCIB/304 *"Weather forecasting is a very particular skill and Met Éireann has a number of experts in that field. It is therefore unsafe to disregard what the State's meteorologists say about the forecast."* All weather forecasts are a computerised numerical prediction, using complex mathematical equations to try and describe motions in the atmosphere. However:

- Met Éireann's forecasts use an 'ensemble' approach, where multiple different predictions are created for what the weather might be at any given time, which are then examined by a forecaster before being assimilated into the published forecast. Other forecasting models, like those typically used by commercial apps, use a 'deterministic' system that produces only a single forecast.

- Met Éireann's forecasts have a regional focus centred on Ireland and the North Atlantic, whereas other forecasting models like those typically used by commercial apps, have a global focus on large-scale weather patterns.

- Met Éireann's weather forecasts analyse a grid area measuring approximately 2.5 km in width, whereas many commercial apps use a much lower resolution, sometimes with an analysed grid area that is 11 times wider, at approximately 28 km in width. Met Éireann's higher resolution means that they can analyse coastline features in a more accurate and realistic way, and inland features such as river valleys, and the associated weather variations that are important to safety afloat such as wind speed, gusts, rainfall and temperature.

4.1.7 Weather models published on all apps at any given time are not necessarily the weather conditions that are most likely to occur in the near future. Typically, weather forecasts are only updated every six hours. The starting point for all weather forecasts is the actual weather conditions when the computer model is run, which may have been some hours beforehand. Therefore, it is important for those going afloat to use the most up-to-date forecast when making any weather-based decision. For example, a weather forecast published on the day or night before a boating activity may be considerably different from the weather forecast published on the morning of that activity just before it commences.

4.1.8 Met Éireann has additional information published[49] on their website www.met.ie about the weather forecasting process. Irrespective of the source of a weather forecast, no weather forecast can be expected to definitively account for the effects of very localised features, such as small coastal headlands or inland river

49. Sources: www.met.ie/education/publications/technical-notes
www.met.ie/education/how-met-eireann-produces-a-forecast
www.met.ie/upgrade-to-met-eireanns-weather-forecast-system-april-may-2020
www.met.ie/education/publications/peer-reviewed-journal-articles-by-met-eireann-staff-members

valleys. Therefore, those going afloat must be cautious in their approach. Recreational boaters must appreciate that forecasts are simply a prediction of what might occur. The forecasted weather will not necessarily be the actual weather, but the forecasted weather is what is most likely to occur.

4.1.9 The MCIB's analysis indicates that the weather conditions were unsuitable for the University of Galway Boat Club's rowing activity and were a causal factor in this marine casualty event.

4.2 The River

4.2.1 This casualty event occurred on a fast-flowing river. A person or boat in the water was being conveyed downstream at approximately 5 kts (2.57 m per second), meaning 100 m in only 39 seconds. The river was in spate, and had been in the weeks beforehand, with a flow rate of 300 cubic metres per second, which exceeded the river's 275 cubic metres per second average, annual winter-season flow rate.

4.2.2 This casualty event occurred on a cold-water river, being approximately 7°C. This was the river water's coldest time of the year, in the middle of the December – March winter conditions.

4.2.3 This casualty event occurred along a section of the river that was known by rowers to be a danger zone because of the presence of the downstream weir, even though this classification was not codified in the Rules of the River agreed between the local rowing clubs. The foreseeable difficulties for a rowing boat that has entered the river's main flow – of being conveyed quickly towards the stationary, downstream hazard formed by the weir and its safety booms – is what the crews involved in this casualty event experienced.

4.2.4 Aside from the three significant hazards of fast flow, cold temperature and a downstream hazard, recreational users of this river face other variables that potentially contribute to a compounding of the dangers. From a man-made perspective, river users must allow for the fact that there is a large regulating weir that is operated to take account of upstream water levels in lakes with a wide rainfall catchment area. From a natural perspective, river users must allow for the fact that a bend in the river a short distance upstream of the weir, constrains the travel paths of boats, as well as a variable river depth due to riverine silting, and variable reed growth that impinges into the river's cross section.

4.2.5 All of the previously described features were identifiable prior to this casualty event, and their possible effect on the safety of an inexperienced crew's rowing activity was reasonably foreseeable using standard trip planning precautions.

4.2.6 The MCIB's analysis indicates that the river conditions were unsuitable for the University of Galway Boat Club's rowing activity and were a causal factor in this marine casualty event.

4.3 The Trip Planning

4.3.1 The foreword to the CoP for the Safe Operation of Recreational Craft describes succinctly the importance of trip planning:

"every trip on the water should be a safe one, which means planning for a safe trip every time, behaving responsibly once afloat, and maximising the chances of survival in the water should an incident occur".

4.3.2 The MCIB concurs with the following summary in *Essentials of Sea Survival* (Golden & Tipton, 2002, Page 11):

"Many accidents, both large-and small-scale, result from a similar set of circumstances. Usually a number of factors are involved, any one of which would have little effect but which in combination result in a deadly spiral of events leading to disaster. This coincidental combination of events may be a mixture of human omissions, errors of judgment, inadvertent actions, poor communication, and adverse weather together with a host of contributory personal and extraneous factors. Therefore, vital components of a good survival strategy are recognition of the warning signs and awareness of the most appropriate corrective response to avert disaster. Accomplishing this requires knowledge, experience, and avoidance of denial."

4.3.3 The MCIB concurs with the following warning issued by Rowing Ireland to their affiliated clubs in 2021, that:

"Many accidents take place because uninformed decisions are made before leaving the boathouse. Weather and water conditions, time of day, equipment, and supervision are all critical components that must be considered to have a safe training session."

4.3.4 The coach from Coláiste Iognáid Rowing Club completed his club's trip planning document prior to deciding to take this group afloat that day. The coach from the University of Galway Boat Club made no record of the decision making process that was done prior to deciding to take this group afloat that day, and no formal assessment of the risks was carried out.

4.3.5 Neither coach had attended any formal training in the operation of a powerboat such as the coach's launches that they were operating that day. Neither coach had obtained any qualifications in the operation of a powerboat, such as Irish Sailing's National Powerboat Certificate or Safety Boat Certificate. Both courses train attendees in session planning skills, weather and the interpretation of weather for the purpose of trip planning afloat.

4.3.6 Planning for an activity requires planning for what is to happen if someone gets into difficulty. The emergency services responded promptly after they were notified, but by then other rowing clubs' boats had started to implement a rescue in very challenging conditions, for which the boats were not designed and

their operators were not trained to do. This was an ad hoc rescue response, which the volunteers undertook at considerable risk to their own safety, which was successful on this occasion, but could easily have not been. A situation seems to have developed amongst the rowing clubs operating on this river that they understood they were responsible for rescuing one another, but without a corresponding understanding of what equipment and techniques are needed to do this in as safe a way as possible.

4.3.7 The MCIB's analysis indicates that inadequate trip planning and contingency planning by the University of Galway Boat Club were a causal factor in this marine casualty event.

4.4 The University of Galway Boat Club's Safety Systems

4.4.1 The University of Galway Boat Club had assigned a volunteer coach to oversee the organisation of the club's novice crews, including the rowing activity that is the subject of this casualty event, without first providing this coach with the safety systems, training or qualifications needed to ensure safety afloat.

4.4.2 The University of Galway Boat Club's crews who embarked on the river that morning consisted of ten college students who were typically in the first year of their studies. They all had less than four months' rowing experience, as they had taken up rowing at the start of the 2022/2023 academic year, but most of this was on water that was much more benign than the fast-flowing section of river where this casualty event occurred. While the coxswain in control of steering one of the rowing boats was the crew's regular coxswain and therefore had four months' experience in this role, the other boat was being controlled by one of the rowers who had volunteered for that role that day, therefore having very limited experience in this role. The CCTV footage of the University of Galway Boat Club's two rowing boats in the final one minute approach towards the weir shows that, the club embarked their crews on a trip for which the crews lacked the skills needed for the prevailing conditions.

4.4.3 The University of Galway Boat Club had not required the crews to undertake either a swimming test to demonstrate their swimming abilities, or a capsize test to train and assess them in the emergency actions needed in the event of a capsize.

4.4.4 Rowing Ireland's accreditation system and coach awards, and Irish Sailing's powerboat qualifications, were available to the University of Galway Boat Club in advance of this casualty event as a means of addressing the trip planning, equipment, and organisational safety factors that have been identified as causal factors in this casualty event.

4.4.5 The club's Safety Statement dated 5 January 2022 included a four page risk assessment for water activities. This identified many of the conditions that occurred during this casualty event; however, the conditions, barriers and

control measures that were identified, were typically not comprehensive or supplemented by procedures to ensure actual implementation during activities.

4.4.6 The club's Emergency Action Plan was not suitably detailed to be effective in the situations it applied to. This document:

- Identified the need for a *"Control Person"* and a *"Course Person"* to carry out important co-ordination tasks during an incident, without identifying who these persons were.
- Erroneously identified that the phone numbers 911 or 112 (instead of the correct 999 or 112) should be used to contact the emergency services.
- Identified the need to phone a named list of club officers in the event of an emergency, without stating the phone numbers for these officers.
- Instructed coaches to carry out potentially unrealistic or inappropriate actions in the event of an emergency on the river, requiring them to *"Approach flipped boat from upwind, taking all water and weather conditions into consideration as you approach"* and to *"Turn off the engine"* which could create further difficulties on this fast flowing river upstream from the weir.

4.4.7 The only call made to the emergency services to report the allision, capsize and stranding of the crews was made by one member of the public on the riverbank who observed the developing situation and became concerned for the safety of the crews; no call was made by the University of Galway Boat Club's representatives to seek emergency assistance for their crews.

4.4.8 The MCIB acknowledges that the University of Galway Boat Club has implemented significant changes to their systems since this casualty event, as described in Section 6.1 of this report.

4.4.9 The MCIB's analysis indicates that inadequate systems in the University of Galway Boat Club were a causal factor in this marine casualty event.

4.5 The Rules of the River

4.5.1 The rowing clubs operating on the River Corrib, in conjunction with Rowing Ireland's regional branch, previously developed the Rules of the River to assist with controlling rowing activities and any interactions between rowing boats.

4.5.2 The Rules of the River, no more so than the Rules of the Road, exist to ensure that vessels act in a safe, predictable, unambiguous manner. The Rules of the River also exist because of the awareness that, those in control of rowing boats on the dynamic conditions of this river may have very little time or the cognitive capacity to interpret and act decisively on other vessels' actions or apparent intentions.

4.5.3 The Rules of the River identify six Danger Areas, highlighted in yellow on the map of the rowing clubs' area of operation. These designated Danger Areas do not include the weir or its upstream safety booms, or the short (150 m) length of river after the final bend in the river upstream of the weir, known as the Jes corner. This conflicts with the descriptions provided to the MCIB, which indicated that the rowing clubs were aware that the weir and its safety booms, and the section of river around the Jes corner, were a Danger Area and that all rowing crews needed to exercise extra precaution when operating in this area.

4.5.4 The Rules of the River recognised that rowing crews typically sought to avoid crossing the river in the upstream vicinity of the weir. It did this by requiring them to complete any crossings upstream of the last bend in the river. It did this by requiring crews to apply the following rule: each boat steers to its own starboard (right-hand) side. If this is applied correctly, one boat will pass by the other along their respective port (left-hand) sides. This is not what occurred in the moments leading up to this casualty event.

4.5.5 The Rules of the River required the youth crew from Coláiste Iognáid Rowing Club, and the accompanying coach's launch boat, to have steered out to the right, from their upstream-moving position close to the riverbank, out towards the river's main downstream flow. While the descriptions indicate that the accompanying coach's launch followed this principle, the rowing boat that was under the verbal control of the coach, did not follow this.

4.5.6 The Rules of the River required the two novice rowing boats from University of Galway Boat, and the accompanying coach's launch boat, to have maintained their downstream-moving position close to the riverbank, away from the river's main downstream flow. The coach's description is that she directed her crews to steer out to their left, away from the riverbank. This took place in a short length of river upstream of the final bend before the weir. By the time the University of Galway Boat Club's coach's boat and the two trailing rowing crews rounded this last bend, they were mid-river and were being conveyed by the river's fast flow directly towards the stationary obstacle of the weir's safety booms. In the circumstances and the prevailing conditions, the coach and crews were unable to act to avert the rowing boats alliding and coming to rest on the weir's safety booms.

4.5.7 The Rules of the River, no more so than the Rules of the Road, exist to ensure that vessels act in a predictable, unambiguous manner. Those in control of rowing boats on the dynamic conditions of this river may have very little time or capacity to interpret other vessels' actions or intentions and to accordingly act in a decisive manner.

4.5.8 The MCIB's analysis indicates that the Rules of the River were unsuitable and that this was a causal factor in this marine casualty event.

4.6 The Weir and its Safety Booms

4.6.1 The presence of the weir is a clear hazard for the operation of vessels upstream of it and its safety booms, or persons who happen to be in the water for whatever reason. There is documentation available to those responsible for the management of the river and its weir, or recreational users intending to share their base of operations with the presence of the weir, to assist with assessing and mitigating the risks posed by the weir's presence.

4.6.2 There is a history of previous, similar incidents at this weir. These previous incidents, in conjunction with this casualty event, demonstrate that a repeat occurrence is likely if no actions are taken to change the current situation.

4.6.3 The safety booms were installed in the 1980s in response to an incident involving rowing boats that shared many similarities with the casualty event that is the subject of this investigation. The safety booms made use of the pre-existing railway piers, which created the opportunity for a final line of defence against a person being washed downstream over the weir. The utilisation of the old railway piers created a situation that conflicts with current recommendations on how to maximise the effectiveness of safety booms in similar circumstances. This refers to the placement of the safety booms perpendicular to the river's direction of flow, and their placement downstream of the railway piers, thereby tending to entrap a person or vessel that comes into contact with the safety booms. This is in conflict with modern recommendations for the installation of such safety booms, which recommend that safety booms are installed at an oblique angle relative to the river's direction of flow so that vessels or swimmers do not have to be extracted against the flow.

4.6.4 There are navigation buoys in the immediate vicinity of the location of events that were a factor in this marine incident (see Figure 44). The navigation buoys are immediately upstream of the river's Jes corner that was a significant factor in the actions and outcome for the vessels involved in this marine incident. It is the understanding of the MCIB based on evidence obtained during this investigation, that these navigation buoys were installed by the Lough Corrib Navigation Trustees because silt deposits had created a potential hazard for vessels navigating the river. The navigation buoys have the effect of reducing the likelihood of vessels experiencing this hazard. The navigation buoys may have reduced the risk associated with this hazard for certain (larger) vessels but the effects of the silting likely remain a factor for other (smaller) vessels, including the silting's effect on the river's speed and potentially also currents.

4.6.5 The safety booms that were a factor in this marine incident were installed, in effect, to serve a purpose similar to the navigation buoys positioned upstream; to guard against a hazard in the immediate vicinity. The presence of the near-riverwide safety booms clearly has an effect on the actions that must be taken by vessels attempting to navigate the river. Work is needed on the safety booms to bring them up to modern design standards to allow vessels to navigate safely in their vicinity.

4.6.6 In February 2024, one of the witnesses who contributed to this investigation volunteered details and photos showing an incident that occurred on the 14 January 2024, exactly one year after the events that are the subject of this investigation. The incident, as described, involved a vessel that had been navigating the river, alliding with the same safety booms and putting its crew in danger, followed by an improvised rescue by another vessel. The river was described as being in flood, and the rowing club's coach's launch boat got stuck on the safety barriers where it took another two boats over an hour to get the boat out. The observer commented that in their opinion, the silt is so bad in the area that it is forcing boats to navigate close to the safety barriers, and when the flow is strong at this time of year it drags the boats into the barriers. It is not for the MCIB in this investigation of the 2023 incident to investigate this recently reported incident but it is relevant to note the fact that this information was provided given the similarities.

4.6.7 The MCIB's analysis indicates that the weir's safety booms were a causal factor in this marine casualty event.

4.7 The Coach's Boat

4.7.1 The coach's launch boat that accompanied the two rowing boats from the University of Galway Boat Club was a powerboat of a catamaran design. It is designed for use by a maximum of four people in steady Force 4 winds, whereas this casualty event occurred when there were near-gale force, gusty winds occasionally in excess of Force 7 (see Section 2.3).

4.7.2 The coach's boat is marketed for use as a coaching boat for competitive rowing, but it is not designed for use in a safety boat role or rescue boat role on the type of fast-flowing section of the river where this casualty event occurred, where there is an expectation that such boats would be able to either remove a full crew from a capsized rowing boat, and/or tow a capsized rowing boat, back to the safety of the riverbank. The coach who operated this boat was aware of its limitations, which is why this coach could only observe the crews from a distance over the 16 minutes it took for coaches' launch boats of a different design to rescue the crews.

4.7.3 The University of Galway Boat Club's coach and their launch boat did not have a whistle or bull horn – as per the minimum requirements in the rules of the national governing body, Rowing Ireland – to assist with communication on the water, especially in an emergency condition or one in which it is difficult to hear commands at a distance. The coach's shouting of instructions at the crew in the moments prior to this casualty event were ineffective; she described how the crews could not hear her commands in the conditions.

4.7.4 The club's Emergency Action Plan stated that *"Coach boats must carry at all times"* the following items that were not present on the day of this casualty event: mobile phone in dry bag; rescue bag (first aid bag, blankets, knife, throw line, whistle); and sound signalling device.

4.7.5 The MCIB's analysis indicates that the coach's launch boat operated by the University of Galway Boat Club was unsuitable for the prevailing conditions and was a causal factor in this marine casualty event.

4.8 Cold Water Immersion

4.8.1 Cold water is defined[50] as water of 15°C or less. On the day of this casualty event, the river's water temperature was particularly cold, at 7°C, being the coldest time of the year for inland waterways and Irish coastal waters. There are known dangers associated with sudden immersion in cold water, and the effects of prolonged exposure to cold water. There is a significant difference in the likely outcome of exposure to the 7°C water that is typically experienced in this river at the end of winter, when compared to the 20°C water temperature that is typically experienced at the end of summer/early autumn.

4.8.2 There was a very high likelihood that, if a participant on this rowing trip was to capsize, they could experience the dangerous effects of either sudden immersion in cold water or prolonged exposure to cold water. While such risks can never be eliminated when afloat, the risk posed by cold water immersion was particularly high in the following circumstances that occurred during this rowing trip:

- A fast-flowing river;
- Rowing boats with limited stability;
- Crews wearing limited amounts of clothing;
- The nearby weir and its enclosure behind safety booms, which reduced the likelihood of a prompt and successful rescue from the water;
- Crews afloat without the safety afforded by the wearing of a PFD in the event of entering the water.

4.8.3 A period of approximately 16 minutes elapsed between the first rowing boat from the University of Galway Boat Club alliding with the safety booms and the last of their crewmembers being removed from there into the rescuing boats to be taken to the shore. The crews became wet and cold in the process but were largely able to remain out of the water, resting onto the safety booms, while awaiting rescue. Those who were rescued all described being either cold or very cold. One or more of the crewmembers could easily have experienced immersion in the river's cold water for the full 16 minutes that elapsed until rescue. One or more of the crewmembers could easily have been washed further downriver beyond the safety booms, either down onto the weir or below it, which would have meant that the possibility of a safe outcome was severely reduced.

50. *Essentials of Sea Survival*, Golden & Tipton, 2002.

4.8.4 Outlined below are important aspects from Chapters 4 and 6 of *Essentials of Sea Survival* dealing with the critical effects on the human body of the initial and short-term responses that occur following immersion in cold water, before the long-term onset of hypothermia:

- The initial response is known as cold shock. The cold water causes a sudden lowering of skin temperature, which has a significant effect on a person's circulation and breathing. The body's responses commence almost immediately upon immersion, peaks during the first 30 seconds, and lasts for two to three minutes. This effect is believed to be responsible for the majority of immersion deaths in cold water, not the later onset of hypothermia.

- The initial changes to the circulation system occur because of constriction of the skin's blood vessels. This increases the resistance to blood flow in the skin. Blood pressure rises dramatically. The heart works harder as it tries to pump blood through constricted blood vessels.

- In cold water an initial breathing gasp of up to two or three litres (lts)– close to the total lung capacity for an adult – is followed by uncontrollable rapid over-breathing (hyperventilation). The rapid over-breathing can result in a ten-fold increase of the volume of gas entering and leaving the lungs each minute, which can cause dizziness and confusion, and can create a sensation of breathing difficulty or suffocation. These are physiological effects that can contribute to the feelings of panic experienced by a person.

- The reduction in breath-hold time that occurs after initial immersion in water is a major danger for a person who is otherwise fit and healthy. While a person may normally be able to hold their breath on average for over one minute, this reduces to less than ten seconds upon immersion in cold water. Consequently, in choppy or turbulent water where small waves may intermittently submerge the head or airway, a person is at risk of inhaling water during the first few minutes until they can regain control over their breathing. Breath-holding to facilitate escape from a capsized or submerged vessel may be difficult and can result in entrapment and drowning. Near drowning can occur after someone has inhaled only a small volume of water, of 0.25–0.5 lts for an average individual, which is a particularly small volume when compared with breathing volumes of over 150 lts recorded in the first minute after immersion in cold water.

- Many of the activities that are critical to survival require effective use of the hands. However, in some cases as short as just minutes, the ability to use the hands is impaired in cold water as they, and the muscles in the forearms that help control them, experience cooling. This can lead to a significant decrease in manual dexterity, handgrip strength, and speed of movement. This loss of ability can have serious consequences for activities such as righting or re-entering an overturned kayak, manipulating the inflation valve of a lifejacket or activating a manually-inflating lifejacket, tightening straps,

locating a whistle and other survival aids, holding onto a flotation aid or activating a signalling device such as a flare.

- Having survived the initial responses, those without a flotation aid will have to make swimming movements to remain afloat or swim to a safe refuge, but it has been shown to be extremely difficult to swim during the first minutes after immersion in cold water, even for those considered to be "good" swimmers in warm water, even to save their lives.

- As buoyant air within the clothing gradually escapes from within the fabric the person experiences a lowering in the water, which requires them to try and lift the head higher out of the water to breathe, which can further exacerbate the effects. Even small waves on the surface can have the effect of bringing the mouth close to water, thereby tending to cause inhalation of water.

- Rescuers have described how the sound of a rescue boat's arrival sometimes prompts a person in the water to wave, but this can disturb the air trapped in and under clothing, which further reduces the person's buoyancy in the water. A person who finds themselves immersed in water should try and remain as motionless as much as possible.

4.8.5 In relation to their exposure to cold water conditions, the rowing crews involved in this casualty event were very fortunate that (a) the safety barriers reduced the seriousness of the situation on this occasion, and (b) the operators of the other coaches' launch boats happened to have been on the river in the vicinity of the weir at the time of this casualty event and were able to improvise a relatively swift and successful response on this occasion.

4.8.6 The MCIB's analysis indicates that cold water immersion was a contributory factor in this marine casualty event.

4.9 Personal Flotation Devices

4.9.1 From the University of Galway Boat Club, whose two rowing boats allided with the safety booms: the coxswain seated in the front of rowing Boat 1 was not wearing a PFD; the coxswain seated in the front of rowing Boat 2 was not wearing a PFD; the coach who was overseeing this rowing session from a launch boat was not wearing a PFD; the coach's launch boat did not contain any PFDs for use by the crews in the event of an emergency; none of the rowers in the two rowing boats were wearing a PFD, nor were they required by legislation[51] to do so.

4.9.2 In the legislation requiring the wearing of a PFD, Regulation 3(3) states that these requirements:

"do not apply to rowers in boats which are —

51. S.I. No. 921 of 2005 (as amended): *The Pleasure Craft (Personal Flotation Devices and Operation) (Safety).Regulations, 2005.*

(a) designed and specifically used for rowing in boat races and which are capable of being entered into regattas or other events recognised by the Irish Amateur Rowing Union [Rowing Ireland], and

(b) of a design and type in respect of which events are held in the Olympic Games or other international rowing regattas."

4.9.3 The effect of the wording in Regulation 3(3) is that the exemption applies to all rowers in the defined types of competitive rowing boat, irrespective of whether the rowing is being done:

- By a novice or an experienced rower;
- By a child or an adult rower;
- In competition or in training;
- In a vessel of a low- or high- stability design;
- In mild or adverse weather conditions;
- In a slow- or fast- moving river;
- In a coastal or inland waterway;
- In a tidal or non-tidal environment;
- While being overseen by a coach, or alone;
- While being accompanied by a suitably equipped and manned rescue boat, or not;
- During an activity that has been properly planned, or not.

4.9.4 The effect of the wording in Regulation 3(3) is that rowers are not required to wear a PFD, but this does not preclude rowers from opting to wear them. Neither does the wording in the Regulations preclude a rowing club or Rowing Ireland from enacting either policies or recommendations that allow for, or encourages the use of, PFDs, either in general or in certain defined circumstances.

4.9.5 The MCIB notes that Rowing Ireland's iRowSafe guidance document, which is currently at pre-publication stage, states (on page 89) that:

"Club Officers are expected to:

- *Determine whether lifejackets should be worn by juniors who have not completed a capsize drill based on a risk assessment that includes the circumstances and their ability.*

- *Make lifejackets available to all rowers and ensure that they are worn by non-swimmers."*

"Everyone is expected to:

- *Wear a [Personal Flotation Device] lifejacket if:*

  They cannot swim.

  They are juniors who have not completed a capsize drill if a risk assessment determines that this is appropriate.

  Because of a medical condition, there is a risk that they may become unconscious or immobile whilst afloat."

4.9.6 The MCIB notes that the Example Risk Management Plans in Rowing Ireland's iRowSafe guidance document (currently at pre-publication stage) lists multiple situations in which the use of a PFD is identified as a possible control measure against hazardous events, such as:

- A capsize in strong winds (section 9.1);
- An inability to land on shore from a capsized rowing boat due to the difficulties of steep banks or walls, or reeds or overhanging trees extending over a large length of bank (section 9.2);
- A capsize in rough water (section 9.3);
- A capsize resulting in hypothermia in very cold water (section 9.3); or
- A capsize in the wash from large or fast boats (section 9.4).

4.9.7 In summary, while there is an exemption in the legislation governing the wearing of PFDs for rowers in the types of rowing boats that were involved in this casualty event, this exemption does not preclude:

- Rowers from opting to wear them; or
- The University of Galway Boat Club from enacting either policies or recommendations that allow for, or encourages the use of, PFDs, either in general or in certain defined circumstances.
- Rowing Ireland from enacting either policies or recommendations that allow for, or encourages the use of, PFDs, either in general or in certain defined circumstances.

4.9.8 The MCIB's analysis indicates that the absence of PFDs worn by any of the rowers – as allowed for in legislation – had the potential to have been a causal factor in this marine casualty event. The rowing crews were fortunate on this occasion

that (a) the safety barriers upstream of the weir reduced the relative seriousness of the situation, and (b) launch boats from other rowing clubs happened to have been on the river in the vicinity of the weir at the time of this casualty event and were able to improvise a relatively swift and successful response on this occasion.

4.10 The Availability of Relevant Systems and Training

4.10.1 Rowing Ireland's accreditation system and coach awards, and Irish Sailing's powerboat qualifications, were available to the University of Galway Boat Club in advance of this casualty event, as a means of addressing the trip planning and organisational safety factors that have been identified as causal factors in this casualty event.

4.10.2 The MCIB's analysis indicates that there was availability of relevant systems and training, therefore a lack of systems and training were neither a causal factor nor a contributory factor in this marine casualty event.

5. CONCLUSIONS

5.1 A scheduled training session on a river for two competitive rowing boats resulted in a marine casualty event that caused the loss of the two rowing boats and posed a threat of death or serious injury to persons who had been operating these recreational vessels in Irish waters.

5.2 A complex system had developed around rowing activities on the River Corrib, with safety contingent on an interplay between the following disperse factors. Centred around all of these was the clear hazard posed by the presence of the weir.

- Water speed
- Water depth
- Water temperature
- Rainfall in the upper reaches of the river's catchment
- Air temperature
- Wind speed
- Wind direction
- Weir operations
- Natural riverine silting
- Natural riverine reed growth
- Historical aspects of river governance
- Contemporary aspects of river governance
- Previous safety initiatives
- Rowing boat design
- Coaching boat design
- Prior experience of crews and coaches
- Training of crews, coaches and rowing clubs' officers
- Boating equipment
- Communications equipment
- Weather forecasting

- Human factors
- Exemption in legislation pertaining to the use of PFDs
- The multiple other rowing clubs operating on the river, including their resourcing, procedures, and outlook on all of the above.

5.3 An issue of risk normalisation had developed around rowing activities in the vicinity of the weir, especially during the river's high flow rates and low water temperatures during winter months. Risk normalisation is the concept of risky behaviour gradually becoming acceptable over time. However, previous incidents had highlighted what these hazards were, and should have highlighted that a repeat incident was highly likely to occur.

5.4 Instead, a system had developed in which the goal of a successful outcome to a rowing activity relied on human input to try and forestall an incident. Persons who had an input in this are likely to have been unaware of how integral they were in forestalling an incident. This system was inherently sensitive to changes or omissions. On the day of this casualty event, it was largely left to a volunteer coach to navigate the issues, despite having not been provided with adequate training or procedures to achieve this goal. As a result, what may have initially appeared to be an innocuous meeting on the river of the rowing boats from two clubs – one group setting out upriver and the other group returning downriver – set in motion a final sequence of events that resulted in loss of two rowing boats and posed a threat of death or serious injury to the crews of these two boats.

5.5 The University of Galway Boat Club experienced a marine casualty event because of a combination of the following causal factors:

1. Unsuitable weather conditions.
2. Unsuitable river conditions.
3. Inadequate trip planning.
4. Inadequate safety systems.
5. Unsuitable Rules of the River.
6. Unsuitable weir safety booms.
7. Unsuitable coach's boat.

5.5.1 **Unsuitable weather conditions:** The weather conditions during this rowing trip were a causal factor in this marine casualty event. The weather conditions were unsuitable for this rowing trip and exceeded the capabilities of the rowing crews. These conditions were foreseeable prior to departure, using standard trip planning skills. A Small Craft Warning and a Gale Warning were in effect from five hours before this rowing trip commenced, as winds of up to Force 8 were

forecasted to occur along the western seaboard. The conditions that were forecasted to occur, did occur; they were not unexpected. The weather conditions meant that the crews were unable to effectively control their boats, to change course away from the approaching weir.

5.5.2 **Unsuitable river conditions:** The river conditions during this rowing trip were a causal factor in this marine casualty event. The river conditions were unsuitable for this rowing trip and exceeded the capabilities of the rowing crews. These conditions were foreseeable prior to departure, using standard trip planning skills. The river was in its normal winter spate conditions, with a high flow rate and a low water temperature. These conditions existed for weeks before and after this casualty event. These conditions occurred in the vicinity of a significant weir, which the crews had to row past on both the outward and return legs. The high flow rate meant that the crews were unable to effectively control their boats, to change course away from the approaching weir. The low water temperature meant that the crews were exposed to the dangers of cold water immersion when their vessels capsized and they entered the water.

5.5.3 **Inadequate trip planning:** The planning that was done for this rowing trip was inadequate and this was a causal factor in this marine casualty event. The club's Code of Conduct required the coach who oversaw this activity to *"Plan and prepare each session appropriately and ensure proper levels of supervision"* and to *"Be aware of weather forecasts and avoid training in unsafe conditions"* but the coach has stated that she was unaware of the existence of this document, and the club did not have procedures in place to ensure that these requirements could be, or actually were, implemented.

5.5.4 **Inadequate safety systems:** The University of Galway Boat Club had inadequate procedures in place for rowing activities and this was a causal factor in this marine casualty event. Safety procedures within an organisation exist, in part, to reduce the likelihood of informal decision-making leading to a poor decision to go afloat in conditions that indicate otherwise. In particular:

a. The club did not have criteria for assisting a coach with determining if an activity may proceed, relating to what constitutes safe or appropriate: crew skills and experience; coach skills and experience; weather conditions; and river conditions.

b. The club's procedures did not adequately take account of the river's flow rate. The river's winter flow rate of c. 300 cubic metres per second is fundamentally different to its summer flow rate of c. 30 cubic metres per second, but the club's procedures did not differentiate adequately between these.

c. The coach had not been provided with the Level 1 Coaching training and qualification intended for persons taking responsibility for the organisation of rowing activities, designed by Rowing Ireland as the national governing body

for rowing. The skills taught on this course include modules relevant to this casualty event, dealing with session planning, safety, emergency procedures, and awareness of water and weather conditions.

d. The coach had not been provided with any formal training or qualifications in the operation of a coach's powerboat such as the National Powerboat Certificate awarded by Irish Sailing as the national governing body for powerboating. The skills taught on this course include important modules relevant to this casualty event, dealing with sources and interpreting of weather forecasts, and accurately assessing wind and current while afloat.

e. The club's risk assessment document identified many of the conditions that occurred during this casualty event; however, the assessment was not comprehensive enough, and not supplemented by the procedures needed to ensure actual implementation during activities.

f. The emergency services described difficulties at the scene with identifying exactly how many persons had been afloat; how many had entered the water; whether everyone had been removed from the water; and exactly where they were after being taken to shore. The club's Emergency Action Plan was not adequate to be effective in the situations it applied to.

5.5.5 **Unsuitable Rules of the River:** These rules were unsuitable for vessels passing one another in high flow conditions in the vicinity of the Jes corner immediately upstream of the weir, and this was a causal factor in this marine casualty event. The rowing clubs operating on the river had developed these rules ten to 12 years ago to assist with controlling rowing activities and interactions between rowing boats on the river. These rules omitted specific reference to the weir, and the contributory factors in this casualty event of the weir's safety booms and the Jes corner. The absence of specific reference to these features conflicts with the awareness amongst some members of the rowing clubs that these features were danger areas, and that rowing crews needed to exercise particular caution when operating there. In the moments prior to this casualty event, the actions taken during the passing of vessels from two rowing clubs indicate that the rules were either not implemented correctly, or were not capable of being implemented correctly by novice crews in winter conditions.

5.5.6 **Unsuitable weir safety booms:** The weir's safety booms were a causal factor in this marine casualty event. The weir's safety booms were effective at preventing the vessels from experiencing an allision on the weir, or being washed down the weir, but the arrangement of the safety booms created a separate allision hazard. The installation of the safety booms in the 1980s at a right angle to the river's flow created a situation that conflicts with current recommendations on how to maximise the effectiveness of such safety booms. This refers to the recommended placement of safety booms at an oblique angle to a river's flow, to ensure that vessels or swimmers that may impact with the safety booms do not have to be extracted against the flow. This weir and its safety booms have had a

history of previous incidents that are effectively the same as, or very similar to, this casualty event. This demonstrates that a repeat incident is likely if action is not taken to change the current situation.

5.5.7 **Unsuitable coach's boat:** The catamaran coaching boat operated by the University of Galway Boat Club was unsuitable for the conditions and was a causal factor in this marine casualty event. This boat type is marketed for use as a coaching boat for competitive rowing, but it is not designed for use in a safety or rescue role on the type of fast-flowing section of river where this casualty event occurred. There was an awareness amongst those who operate this type of boat on this river that it lacks the power and manoeuvrability needed to fulfil this safety and rescue function.

5.6 The omission of PFDs had the potential to have been a causal factor in this marine casualty event. Those afloat from the University of Galway Boat Club were fortunate on this occasion that (a) the safety barriers upstream of the weir reduced the relative seriousness of the situation, and (b) launch boats from other rowing clubs happened to have been on the river in the vicinity of the weir and were able to improvise a relatively swift and successful response on this occasion. A change in the multiple variables involved in this casualty event could have created the conditions in which the correct wearing of a suitable PFD became of critical importance to a safe outcome.

5.6.1 The University of Galway Boat Club had three club members afloat who were not wearing the PFD required of them by the relevant legislation. These were the coach in the launch boat, and the two crewmembers acting as the coxswain to steer the two boats from their non-rowing seats. The two coxswains entered the water with the rowers when their vessels capsized, and one of them required assistance to escape from the seating position. The coach's launch boat did not contain any PFDs for use in the event of an emergency.

5.6.2 None of the eight rowers in the two rowing boats were wearing a PFD, nor were they required by the relevant legislation to do so because of the exemption pertaining to rowers in this type of competitive rowing boat. The effect of the wording in the relevant legislation is that, the exemption on the wearing of PFDs applies to all rowers in the defined types of rowing boat, irrespective of whether the rowing is being done by: an adult or child; of any experience; in vessels of low-stability or high-stability design; in the full variety of water and weather conditions; whether in competition or for pure recreation; whether being overseen by a coach or rescue boat, or neither; and irrespective of whether the activity has been properly planned, or not.

5.6.3 While the effect of the wording in the relevant legislation is that rowers are not, as a matter of law, required to wear a PFD, this does not preclude rowers from opting to wear them. Neither does it preclude a rowing club or Rowing Ireland from enacting either policies or recommendations that allow for, or encourages the use of, PFDs either in general or in defined circumstances. The wording of

the exemption in Statutory Instrument (S.I.) No. 921 of 2005 Pleasure Craft (Personal Flotation Devices and Operation) (Safety) Regulations 2005 may act as a deterrent to deeper consideration of relevant safety features that warrant the use of PFDs, and could have been a contributory factor had any of the crew been unable to temporarily extract themselves from the water onto the safety barrier.

6. SAFETY RECOMMENDATIONS

6.1 Safety Changes Enacted

The Marine Casualty Investigation Board acknowledges the work done to-date by the University of Galway to enact changes to rowing activities on the River Corrib, both within and without the University of Galway Boat Club, which include:

1. Changes to Procedures:

    a. Novice rowing crews: Novice crews no longer operate from the Club's boathouse near the Salmon Weir; all rowing activity for novice crews has been moved to the University's facility at Dangan Sportsground, approximately 2.5 km upstream from the Salmon Weir.

    b. Escort system: Two coach launches must accompany every rowing boat afloat in the zone between the Salmon Weir and Quincentennial Bridge.

    c. External safety consultant: Appointed to audit existing procedures, and identify and implement changes to the club's operations and safety management system.

    d. Session-Specific Risk Assessment: Implemented to assist coaches with activity planning and the decision making process for each rowing activity.

    e. Safety Statement: This has been amended to include an Emergency Action Plan involving the weir.

    f. Meetings with Rowing Ireland's Safety Advisor: To identify improvements to procedures.

    g. Meetings with senior representatives of other rowing clubs operating on the River Corrib: To identify improvements to procedures.

    h. Revisions to the Rules of the River: The process of revising these rules, in conjunction with the other clubs operating on the river, has commenced.

    i. The weir's safety booms: The club is contributing to discussions amongst the relevant parties to assess if the safety booms can be reconfigured to provide an oblique alignment across the river, instead of the current right-angle alignment.

    j. New Clubhouse facility: The University of Galway is further developing its existing plans to relocate all rowing activities away from the current boathouse on the Eglington canal to a new purpose-built premises on the University of Galway's property upstream from Quincentennial Bridge.

2. Changes to Training:

   a. External safety consultant: Appointed to identify and implement changes to the training of the club's members.

   b. Weather forecasts: Members of the club have received training on how to source and assess weather forecasts.

   c. Powerboat qualifications: Operators of coach's launches have received training and qualifications to Irish Sailing's Level 2 (National Powerboat Certificate) and Level 3 (Safety Boat Certificate).

   d. Very high frequency communications: Operators of coach's launches have received training and qualification in the use of handheld marine Very high frequency radios.

   e. Capsize drills: All active Club members have undertaken a capsize drill.

   f. Swimming test: All active Club members have undertaken a swimming test.

   g. Coach training: Additional training has been undertaken to Rowing Ireland standards.

   h. First Aid and cardiopulmonary resuscitation training: Additional training of coaches has been undertaken.

3. Changes to Equipment:

   a. New coach's boats: The process of procuring new launch boats more suited to the river's conditions has commenced.

   b. Safety equipment for all coach's launch boats: This has been re-evaluated, to ensure provision of towline, tools, emergency blankets, additional life buoys, and first aid supplies.

   c. Personal flotation devices: All personal flotation devices operated by the University of Galway Boat Club have been inspected and serviced.

   d. First aid kits: All have been inspected and restocked.

6.2 Recommendations to the University of Galway Boat Club

That the University of Galway Boat Club implements:

1. Changes to Procedures:

   a. Novice rowing crews: During the winter months period to be defined by the University of Galway Boat Club, ensure that novice crews do not

operate on the River Corrib downstream of Quincentennial Bridge.

b. Escort system: Ensure provision of coach's launches of a number to be defined by the University of Galway Boat Club, to accompany every club rowing boat afloat in the zone between the Salmon Weir and Quincentennial Bridge.

c. Club's Safety Advisor and/or external safety consultant: Implement an annual audit by this person(s) of the club's operations and safety management system.

d. Session-Specific Risk Assessment: Continue to implement and update as required, Session-Specific Risk Assessments to assist coaches with activity planning and the decision making process for each rowing activity.

e. Safety Statement: Implement an annual audit by the club's Safety Advisor and/or external safety consultant of the club's safety statement and Emergency Action Plan.

f. Meeting with Rowing Ireland's Safety Advisor: Implement an annual meeting to identify any ongoing improvements to the club's procedures.

g. Meetings with senior representatives of other rowing clubs operating on the River Corrib: Implement an annual meeting with these representatives to identify any ongoing improvements to procedures.

h. Revisions to the Rules of the River: Complete the process of revising these rules, in conjunction with the other rowing clubs operating on the River Corrib and Rowing Ireland.

i. The weir's safety booms: Continue to contribute to discussions amongst the relevant parties to assess if the safety booms can be reconfigured to provide an oblique alignment across the river, instead of the current right-angle alignment.

2. Changes to Training:

a. Safety Advisor and/or external safety consultant: Implement an annual audit by this person(s) of the adequacy of the club's training of members.

b. Weather forecasts: Ensure that all persons providing coaching services to the club progress through Rowing Ireland's Coach Education Programme.

c. Powerboat qualifications: Ensure that coach's launches are only operated by persons who have received training and qualifications to Irish Sailing's Level 2 (National Powerboat Certificate) or equivalent. Implement upskilling of club members to Irish Sailing's Level 3 (Safety Boat Certificate) or equivalent qualification.

d. Very high frequency communications: Ensure that coach's launches are manned by at least one person who has received training and qualification in the use of a handheld marine very high frequency radio.

e. Capsize drills: Ensure ongoing compliance by the club with Rowing Ireland's recommendations for capsize drill training of club members.

f. Swimming test: Ensure ongoing compliance by the club with Rowing Ireland's recommendations for swimming ability of club members.

g. Coach training: Ensure that all persons providing coaching services to the club progress through Rowing Ireland's Coach Education Programme.

h. First Aid and cardiopulmonary resuscitation training: Ensure that all persons providing coaching services to the club comply with Rowing Ireland's recommendations for first aid and cardiopulmonary resuscitation training.

3. Changes to Equipment:

a. New coach's boats: Complete implementation of new launch boats assessed by the club to be more suited to the river's conditions.

b. Safety equipment for all coach's launch boats: Ensure that all coach's launch boats comply with Rowing Ireland's recommendations for safety equipment on every occasion the vessel is taken afloat.

c. Personal Flotation Devices:

i. Ensure that the club's procedures ensure compliance by members with statutory requirements on the use of Personal Flotation Devices.

ii. Implement procedures for the use of Personal Flotation Devices by rowers based on abilities, conditions and the guidance of Rowing Ireland.

iii. Ensure that a Personal Flotation Device is either being worn by every rower or is available for deployment to every rower from an accompanying coach's launch boat.

d. First Aid kits: Ensure that all coach's launch boats comply with Rowing Ireland's recommendations for first aid kits on every occasion the vessel is taken afloat.

6.3 Recommendations to Rowing Ireland and Sport Ireland

That Rowing Ireland, in conjunction with Sport Ireland:

a. Conduct a thorough compliance audit of the Club Self Assessment Safety

Audit submitted to Rowing Ireland by:

i. All clubs seeking to achieve first-time affiliation with Rowing Ireland.

ii. A selection of clubs seeking to renew their annual affiliation with Rowing Ireland.

b. Ensure that all club members providing coaching services commence and progress through Rowing Ireland's Coach Education Programme.

c. Further implement the effective dissemination of Rowing Ireland's safety recommendations to affiliated clubs, including:

i. The RowSafe safety manual.

ii. The iRowSafe incident reporting system.

iii. The iRowSafe annual analysis report.

iv. Periodic publication of Safety Bulletins.

v. Session-Specific Risk Assessments issued in Advisory Note 1/Feb/23.

vi. The *Club Safety Statements* training resource prepared to assist clubs in developing their safety systems.

d. Enact either policies or recommendations that allow for, and encourages the use of, PFDs by rowers, either in general or in defined circumstances.

e. Audit the implementation of the Safety Recommendations addressed[52] to Rowing Ireland in Report No. MCIB/286.

6.4 Recommendations to the Minister for Transport

That the Minister for Transport:

a. Includes in the Code of Practice for the Safe Operation of Recreational Craft, guidance on hazard identification, analysis, evaluation and the implementation of control measures.

b. Review S.I. No. 921 of 2005 Pleasure Craft (Personal Flotation Devices and Operation) (Safety) Regulations 2005 as amended regarding its application to the use of Personal Flotation Devices in Olympic style rowing boats, especially in relation to during training, as previously recommended in Report No. MCIB/286.

52. Report No. MCIB/286, *Report into incident involving an Olympic style rowing boat near the Salmon Weir, Thomondgate, Limerick, 23 February 2019.*

6.5 Recommendations to all Rowing Clubs Operating on the River Corrib

That all organisations undertaking rowing activities on the River Corrib:

a. Undertake an audit of their operating procedures and safety systems.

b. Implement this report's Safety Recommendation 6.2 within their organisation where relevant.

c. Liaise with Rowing Ireland and all other organisations undertaking rowing activities on the River Corrib to prepare an updated version of the Rules of the River.

6.6 Recommendations to the Entities with Responsibility for the River Corrib

6.6.1 Preface in respect of this Recommendation.

The Marine Casualty Investigation Board sought to engage with the Trustees of the Lough Corrib Navigational Trust in respect of the terms of the Recommendation. The position of the Trustees is that *"The Trustees of the Lough Corrib Navigational Trust operate within the provisions of the Lough Corrib Navigation Act 1945 and that this Act does not provide the Trustees with the mandate or statutory powers to enable them to implement the recommendations of the MCIB as set out at clause 6.6 of the report."* The Trustees requested that the Recommendation be addressed to the Office of Public Works given their asserted responsibility for the *"full and active control of the Salmon weir"*. To clarify, at 2.4.1 above, it is stated that the weir *"is under the active control of the Office of Public Works, which controls the opening and closing of the 16 sluice gates to regulate the amount of water passing down the weir."*

The Recommendation remains addressed to the Lough Corrib Navigation Trustees as this investigation is focused on the factors arising from an incident involving the navigation of the river by vessels. The Marine Casualty Investigation Board's investigation identified that a factor in this marine incident was the navigation of this river by vessels.

The Marine Casualty Investigation Board has also had regard to the content of the Code of Practice for the Safe Operation of Recreational Vessels at section 1 (pages 34 and 35) which describes how:

"…In Ireland, Waterways Ireland has responsibility for the Shannon Navigation, the Grand Canal, the Royal Canal, the Barrow Navigation and the Shannon Erne Waterway. The Corrib is managed by the Corrib Navigation Trustees. Parts of other waterways come under the jurisdiction of the relevant Harbour Authority and still others (e.g. the Slaney) have no navigation authority per se but may be subject to local authority byelaws."

"Navigation on the Corrib System: The Lough Corrib Navigation Trustees are responsible for the maintenance of navigation aids and a limited number of piers on the Corrib system, maintenance of the Eglinton canal system, associated walkways, tow paths, lock gates and boundary walls."

It became clear during the investigation that there is a history of uncertainty in Galway as to exactly which entities have a responsibility for the various aspects of the River Corrib, including aspects dealing with use, navigation, safety and maintenance. The Marine Casualty Investigation Board notes and acknowledges the content from a Statutory Audit Report[53] dated October 2021, prepared by the Local Government Audit Service and addressed to Galway City Council, which described some of the legislative issues with the contemporary basis of the Lough Corrib Navigation Trust. In the official response to this Audit Report, the Chief Executive of Galway City Council stated that:

"The issues noted have been raised with the Department of Housing, Local Government and Heritage and also with the Department of Justice and Equality regarding the requirement for amending legislation or other provisions to deal with the legal status of the trust. The Council has advised the members of the Lough Corrib Navigation Trust and also the Chief Executives of the other local authorities involved of the issues and the requirement for a solution. A number of interim arrangements have also been put in place in the name of the Council regarding insurances, contracts, licences etc., as a holding position until the issues are resolved." [Emphasis Added]

It is not within the remit of the Marine Casualty Investigation Board to address whatever issues exist (or not) as to the respective responsibilities for the safety of the weir and vessels navigating in its vicinity. The Recommendation is designed to encourage all stakeholders to co-operate and to address the issues identified in this report. A copy of this report has been sent to the Office of Public Works and to Galway City Council.

6.6.2 That the Lough Corrib Navigation Trustees liaise as appropriate with those involved in the operation and maintenance of the River Corrib and the Salmon Weir; those tasked with ensuring water safety in Galway city; and those undertaking recreational activities on the River Corrib, to:

a. Complete a risk assessment of the Salmon Weir and its safety booms to identify methods to eliminate, reduce and/or manage risks associated with recreational activities on the river and navigation by recreational vessels.

b. Consider the creation and execution of an integrated plan to improve the safety of recreational activities on the River Corrib.

53. https://assets.gov.ie/224461/713c9dd4-170c-414a-b51d-95d9332f8d16.pdf

7. APPENDICES

Appendix 7.1 Met Éireann (Pre-Incident) Weather Forecast

Met Éireann

24-hour Sea Area Forecast

Updated at 0000 / 0600 / 1200 / 1800

Sea Area Forecast until 0600 Sunday, 15 January 2023
Issued at 0600 Saturday, 14 January 2023

1. **Gale warning:** In operation
Small craft warning: In operation

2. **Meteorological situation at 0300:** A strong westerly airflow over Ireland will strengthen today with low pressure 979hPa to the north of Ireland slowly moving eastwards. A cold front over the Irish Sea clears eastwards.

3. **Forecast for Irish coastal waters from Valentia to Erris Head to Fair Head**

Wind: Increasing west to northwest force 7 or gale force 8 and gusty imminent. Soon becoming westerly and increasing to strong gale force 9 in the north, reaching storm force 10 between Bloody Foreland and Fair Head. Later decreasing north to northwest force 6 to gale force 8.

Weather: Showers with possible isolated thunderstorms.

Visibility: Often moderate or poor.

Forecast for Irish coastal waters from Fair Head to Wicklow Head to Valentia and the Irish Sea

Wind: Increasing westerly force 6 or 7 imminent. Soon further increasing westerly force 7 or gale force 8 and gusty. Later reaching strong gale force 9 at times. Decreasing west to northwest force 6 to gale force 8 at end of period.

Weather: Rain clearing imminent to showers.

Visibility: Improving good imminent, decreasing moderate or poor at times in showers.

Warning of Heavy Swell: Heavy swell developing on Atlantic coasts overnight Saturday and on Sunday.

4. **Outlook for a further 24 hours until 0600 Monday 16 January 2023:** West to northwest airflow will weaken becoming fresh to strong. Airflow will become northerly Sunday night. Weather: Frequent showers.

Appendix 7.1 Met Éireann (Pre-Incident) Weather Forecast

Met Éireann

Text of Gale Warning
West to northwest winds will increase to gale or strong gale force on Saturday afternoon on Irish coastal waters from Loop Head to Malin Head to Howth Head and on the North Irish Sea, extending to all Irish coastal waters this evening. Winds will reach storm force this evening between Bloody Foreland and Fair Head.

Text of Small Craft Warning
See gale warning.

Coastal Reports	5 AM Saturday, 14 January 2023
Malin Head Automatic	Southwest, 24 Knots, Rain shower, 9 Miles, 988, Falling
Dublin Airport	West, 14 Knots, Gust 26 Knots, Light rain, 9 Miles, 991, Falling
Buoy M5 51° 41'N 6° 42'W	West, 10 Knots, Wave ht: 3.4 m, The visibility at Tuskar is greater than 10 Miles, 994, Falling slowly
Roches Point Automatic	West, 9 Knots, Light drizzle, 15 Miles, 996, Steady
Sherkin Island Automatic	West, 18 Knots, Rain shower, 7 Miles, 997, Rising slowly
Valentia Automatic	West-Northwest, 16 Knots, Gust 28 Knots, Recent drizzle, 18 Miles, 998, Rising slowly
Mace Head Automatic	West, 23 Knots, Gust 36 Knots, Recent drizzle, 10 Miles, 994, Falling slowly
Belmullet Automatic	West, 14 Knots, Gust 31 Knots, Rain shower, 13 Miles, 992, Falling slowly
Buoy M1 53° 8'N, 11° 12'W	Report not available
Buoy M2 53° 29'N, 5° 26'W	West-Southwest, 12 Knots, Wave ht: 2.1 m, 991, Falling
Buoy M3 51° 13'N, 10° 33'W	West-Northwest, 20 Knots, Wave ht: 4.2 m, 999, Rising slowly
Buoy M4 55° 0'N 10° 0'W	West, 22 Knots, Wave ht: 4.6 m, 989, Falling slowly
Buoy M6 53° 4'N 15° 56'W	Northwest, 24 Knots, Wave ht. 4.3 m, 1000, Rising slowly

Disclaimer: buoy locations are approximate and are not for navigational purposes

Sea Crossings	State of sea until 0600 Monday 16 January 2023
Dublin - Holyhead	Rough, decreasing moderate Sunday.
Rosslare - South Wales	Rough to very rough.
Cork - South Wales	Mostly very rough, decreasing moderate to rough Sunday.
Rosslare - France	Very rough, increasing high on Sunday.
Cork - France	Very rough, increasing high on Sunday.

Next update before 1300 Saturday, 14 January 2023

Appendix 7.1 Met Éireann (Pre-Incident) Weather Forecast

Met Éireann

24-hour Sea Area Forecast

Updated at 0000 / 0600 / 1200 / 1800

Sea Area Forecast until 0000 Sunday, 15 January 2023
Issued at 0000 Saturday, 14 January 2023

1. Gale warning: In operation
Small craft warning: In operation

2. Meteorological situation at 2100: Low pressure 990hPa centred near the northwest of Ireland generates a strong southwest airflow. Associated fronts cross the country eastwards.

3. Forecast for Irish coastal waters from Mizen Head to Erris Head to Fair Head

Wind: Becoming westerly force 6 or 7 imminent. Soon increasing west to northwest force 7 or gale force 8 and gusty. Later increasing to strong gale force 9 in the north, possibly reaching storm force 10 between Bloody Foreland and Fair Head.

Weather: Rain clearing imminent to showers. Possible isolated thunderstorms later.

Visibility: Often moderate or poor.

Forecast for Irish coastal waters from Fair Head to Wicklow Head to Mizen Head and the Irish Sea

Wind: South to southwest force 6 or 7 decreasing westerly force 4 to 6 imminent. Soon increasing force 6 or 7. Later further increasing westerly force 7 or gale force 8 and gusty.

Weather: Rain soon clearing to showers.

Visibility: Moderate or poor, soon improving good between showers.

Warning of Heavy Swell: Heavy swell developing on Atlantic coasts on Sunday.

4. Outlook for a further 24 hours until 0000 Monday 16 January 2023: Strong to gale force west to northwest winds will gradually weaken fresh to strong on Sunday and become northerly. Weather: Frequent showers.

Appendix 7.1 Met Éireann (Pre-Incident) Weather Forecast

Met Éireann

Text of Gale Warning
West to northwest winds will increase to gale or strong gale force on Saturday morning and afternoon on Irish coastal waters from Loop Head to Malin Head to Howth Head and on the North Irish Sea, extending to all Irish coastal waters Saturday night.

Text of Small Craft Warning
See gale warning.

Coastal Reports	11 PM Friday, 13 January 2023
Malin Head Automatic	South-Southeast, 17 Knots, Rain shower, 8 Miles, 994, Falling rapidly
Dublin Airport	South, 10 Knots, Light rain, 8 Miles, 1000, Falling rapidly
Buoy M5 51° 41'N 6° 42'W	South-Southwest, 24 Knots, Gust 36 Knots, Wave ht: 3.2 m, The visibility at Tuskar is 2 Miles, 1002, Falling rapidly
Roches Point Automatic	South-Southwest, 27 Knots, Gust 34 Knots, Moderate rain, 2 Miles, 999, Falling rapidly
Sherkin Island Automatic	South-Southwest, 18 Knots, Moderate rain, 1.1 Miles, 999, Falling rapidly
Valentia Automatic	West, 7 Knots, Light rain, 3 Miles, 1000, Falling
Mace Head Automatic	Southwest, 14 Knots, Rain shower, 2 Miles, 997, Falling
Belmullet Automatic	West-Southwest, 17 Knots, Gust 27 Knots, Recent rain, 5 Miles, 995, Falling
Buoy M1 53° 8'N, 11° 12'W	Report not available
Buoy M2 53° 29'N, 5° 26'W	South, 28 Knots, Wave ht: 2.1 m, 1001, Falling rapidly
Buoy M3 51° 13'N, 10° 33'W	West-Northwest, 10 Knots, Gust 24 Knots, Wave ht: 4.8 m, 999, Falling
Buoy M4 55° 0'N 10° 0'W	Southwest, 23 Knots, Wave ht: 4.6 m, 992, Falling
Buoy M6 53° 4'N 15° 56'W	West-Northwest, 23 Knots, Wave ht: 4.1 m, 998, Falling slowly

Disclaimer: buoy locations are approximate and are not for navigational purposes

Sea Crossings	State of sea until 0000 Monday 16 January 2023
Dublin - Holyhead	Moderate to rough.
Rosslare - South Wales	Rough to very rough.
Cork - South Wales	Mostly very rough.
Rosslare - France	Very rough, increasing high on Sunday.
Cork - France	Very rough, increasing high on Sunday.

Next update before 0700 Saturday, 14 January 2023

Appendix 7.1 Met Éireann (Pre-Incident) Weather Forecast

Met Éireann

24-hour Sea Area Forecast

Updated at 0000 / 0600 / 1200 / 1800

Sea Area Forecast until 1800 Saturday, 14 January 2023
Issued at 1800 Friday, 13 January 2023

1. **Gale warning:** In operation
   Small craft warning: In operation

2. **Meteorological situation at 1500:** Ireland lies in a strong to near gale force southwesterly airflow between a depression of 989 hPa southwest of Norway and a depression of 985hPa southwest of Iceland.

3. **Forecast for Irish coastal waters from Valentia to Erris Head to Malin Head**

Wind: South to southwest force 5 to 7 and gusty. Soon veering southwest to west force 6 or 7 and gusty. Later increasing west force 7 to strong gale force 9 and gusty, possibly touching storm force 10 north of Rossan Point.

Weather: Cloudy with outbreaks of rain. Soon clearing to scattered showers with a chance of thunder and hail.

Visibility: Moderate or poor in precipitation. Soon mostly good but decreasing moderate or poor in showers.

Forecast for Irish coastal waters from Malin Head to Carlingford Lough to Carnsore Point and for the Irish Sea

Wind: South force 6 or 7 and gusty imminent. Soon veering west and decreasing force 5 or 6 and gusty. Later increasing force 7 to strong gale force 9 and gusty, possibly touching storm force 10 north of Belfast Lough.

Weather: Cloudy with outbreaks of rain. Later clearing to scattered showers with a chance of thunder and hail.

Visibility: Moderate or poor in precipitation. Later mostly good but decreasing moderate or poor in showers.

Forecast for Irish coastal waters from Carnsore Point to Roches Point to Valentia

Wind: Southwest force 5 to 7. Soon veering west to northwest and increasing force 6 or 7 and gusty.

Weather: Cloudy with outbreaks of rain. Later clearing to scattered showers with a chance of thunder and hail.

Visibility: Moderate or poor in precipitation. Later mostly good but decreasing moderate or poor in showers.

Warning of Heavy Swell: Heavy swell developing on Atlantic coasts on Sunday.

4. **Outlook for a further 24 hours until 1800 Sunday 15 January 2023:** Near gale to strong gale force west to northwest winds, gradually decreasing fresh to near gale force during Sunday. Weather: Fair or cloudy with outbreaks of rain or showers, some wintry.

Appendix 7.1 Met Éireann (Pre-Incident) Weather Forecast

Met Éireann

Text of Gale Warning
Westerly winds will reach gale or strong gale force on Saturday morning and afternoon on Irish coastal waters from Loop Head to Malin Head to Howth Head and on the north Irish Sea.

Text of Small Craft Warning
South to southwest winds, veering west to northwest, will reach force 6 or higher on all Irish coasts.

Coastal Reports	5 PM Friday, 13 January 2023
Malin Head Automatic	South-Southwest, 12 Knots, Cloudy, 8 Miles, 1004, Steady
Dublin Airport	South-Southwest, 7 Knots, Cloudy, 13 Miles, 1008, Steady
Buoy M5 51° 41'N 6° 42'W	Southwest, 19 Knots, Wave ht. 3.1 m, The visibility at Tuskar is greater than 10 Miles, 1012, Falling slowly
Roches Point Automatic	South-Southwest, 18 Knots, Cloudy, 6 Miles, 1009, Falling
Sherkin Island Automatic	South-Southwest, 23 Knots, Moderate rain, 1.0 Miles, 1008, Falling
Valentia Automatic	South, 15 Knots, Rain shower, 1.7 Miles, 1006, Falling rapidly
Mace Head Automatic	South-Southwest, 29 Knots, Gust 41 Knots, Light rain, 3 Miles, 1002, Falling rapidly
Belmullet Automatic	South-Southeast, 17 Knots, Cloudy, 6 Miles, 1001, Falling rapidly
Buoy M1 53° 8'N, 11° 12'W	Report not available
Buoy M2 53° 29'N, 5° 26'W	West-Southwest, 13 Knots, Wave ht: 1.7 m, 1009, Steady
Buoy M3 51° 13'N, 10° 33'W	South-Southwest, 21 Knots, Wave ht: 4.8 m, 1007, Falling rapidly
Buoy M4 55° 0'N 10° 0'W	South, 18 Knots, Wave ht: 5.4 m, 1000, Falling rapidly
Buoy M6 53° 4'N 15° 56'W	West-Southwest, 25 Knots, Wave ht: 5 m, 998, Falling slowly

Disclaimer: buoy locations are approximate and are not for navigational purposes

Sea Crossings	State of sea until 1800 Sunday 15 January 2023
Dublin - Holyhead	Moderate to rough.
Rosslare - South Wales	Rough to very rough.
Cork - South Wales	Rough to very rough.
Rosslare - France	Rough to very rough.
Cork - France	Rough to very rough.

Next update before 0100 Saturday, 14 January 2023

Appendix 7.1 Met Éireann (Pre-Incident) Weather Forecast

Copy of archived forecast scripts as were issued on Friday 13-January-2023.

National forecast script (issued to national radio and published on met.ie).

```
Weather Forecast issued at 1230 Hours Friday, 13 Jan 2023

Breezy with scattered showers, most frequent in the north but dying out
early this afternoon. It will then stay dry and bright for a time, before
cloud and outbreaks of rain push in from the west later in the afternoon
and evening, gradually extending to all areas. Highest afternoon
temperatures of 6 to 9 degrees. Moderate to fresh westerly winds,
gradually backing southerly.


Outbreaks of rain, clearing eastwards overnight with isolated showers
following from the west. Temperatures will fall to between 1 to 4 degrees
as the rain clears. Moderate to fresh southwesterly winds.


Sunny spells and blustery showers tomorrow, most frequent in the north
and west with a chance of some thunder, hail and sleet. Westerly winds
will turn strong at times, especially in the northwest. Highest afternoon
temperatures of 4 to 7 degrees.
□


Filename: regi1312.txt
```

Regional forecast script (issued to regional radio stations).

```
Issued at 12:53 Friday, 13 Jan 2023

Apart from a few isolated showers, it will be dry for a time this
afternoon, but cloud and rain will spread from the west through the
afternoon and evening. Highest afternoon temperatures of 6 to 9 degrees
in freshening southwest winds.

Outbreaks of rain at first tonight with heavy falls in places, but the
rain will clear overnight with some shows to follow. Temperatures will
fall between 1 to 4 degrees, with winds easing for a time, but picking up
again later in the night.


Tomorrow, Saturday, will be a blustery day, with a mix of sunshine and
heavy showers, some of hail with a chance of isolated thunderstorms.
Highest afternoon temperatures of 5 to 7 degrees, but feeling colder due
to the wind chill factor.



Winds on Galway Bay: southwest force 5 and gusty, backing southerly and
increasing force 6 or 7 and gusty this evening. Veering westerly overnight
and  decreasing force 4 or 5 for a time. Increasing force 6 or 7 again
later tonight and tomorrow morning.


Filename: gbfmEMAIL131255.txt
```

Appendix 7.1 Met Éireann (Pre-Incident) Weather Forecast

Copy of archived forecast scripts as were issued on Saturday 14-January-2023.

National forecast script (issued to national radio and published on met.ie).

```
Weather Forecast issued at 0930 Hours Saturday, 14 Jan 2023

Today will be cold with sunny spells. Showers will extend eastwards and
become widespread, some heavy with hail and isolated thunderstorms
possible. This afternoon, westerly winds will strengthen and will become
very strong in the northwest and north with gales and severe gusts in
coastal areas. Highest temperatures of 4 to 7 degrees.


Early tonight the very strong, gusty westerly winds will continue in
Ulster and will ease somewhat overnight. Westerly winds will be fresh to
strong and gusty elsewhere. There will be clear spells and showers. A
band of heavier rain will move southwards overnight, falling as sleet in
places with hail or lightning possible. Lows of 0 to +3 degrees with a
touch of frost.


Sunday morning will be mostly cloudy in Connacht, Munster and south
Leinster with showers or longer spells of rain. sunny spells in Ulster
and north Leinster, but showers will develop here also through the day,
some of hail with isolated thunderstorms possible. Highest temperatures
of 4 to 7 degrees with mostly moderate westerly winds.
□

Filename: regi1409.txt
```

Regional forecast script (issued to regional radio stations).

```
Issued at 05:53 Saturday, 14 Jan 2023

Today will be cold with scattered showers and some sunny spells. It will
turn rather windy this afternoon and evening with fresh to strong and
gusty westerly winds. Isolated hail and lightning are possible, with some
falls of sleet over high ground. Afternoon temperatures of 4 to 7
degrees.


Winds on Galway Bay: West to northwest force 6 or 7 increasing to gale
force 8 and gusty this afternoon.


Filename: gbfmEMAIL140554.txt
```

Appendix 7.2 Met Éireann (Post-Incident) Weather Report

Met Éireann
The Irish Meteorological Service
Climate Services
Glasnevin Hill
Dublin 9
Seirbhísí Aeráide
Cnoc Ghlas Naíon
Baile Átha Cliath 9
Tel: +353-1-8064260
Email: legal@met.ie

Our Ref: WS1730/2305_39
Your Ref: MCIB/12/325

WEATHER REPORT

14-January-2023	
Meteorological Synopsis:	A depression to the north of Ireland steered an active cold front eastward across the country in an unstable and freshening westerly airflow.
Estimated weather conditions in the River Corrib area, Galway city on Saturday 14-January-2023 between 02:00 and 14:00 hours	
Wind:	West-southwesterly winds were moderate at first Force 4 (mean wind speed 12 to 16 knots) until around 06:00 hours. Winds gradually increased and veered westerly fresh to strong Force 5 or 6 occasionally near-gale Force 7 (mean wind speed 17 to 32 knots); gusts up to 45 knots may have occurred.
Weather & Precipitation:	Overnight heavy rain affected the area until around 4am. From 6am onwards there were occasional blustery showers, some of the showers were heavy. The daily rainfall total (from midnight to midnight) is estimated at 2 to 5 mm.
Visibility:	Visibility was occasionally moderate or poor (1 to 3 nautical miles) in rain or heavy showers otherwise the visibility was good (greater than 5 nautical miles).
Temperature:	Air temperatures ranged between 4 and 8 degrees Celsius.

This report was issued on: 30 May 2023

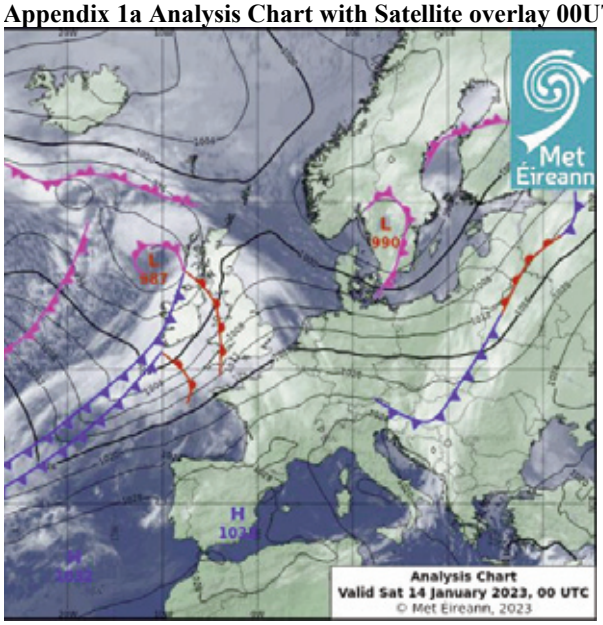
Appendix 7.2 Met Éireann (Post-Incident) Weather Report

Met Éireann
The Irish Meteorological Service
Climate Services
Glasnevin Hill
Dublin 9

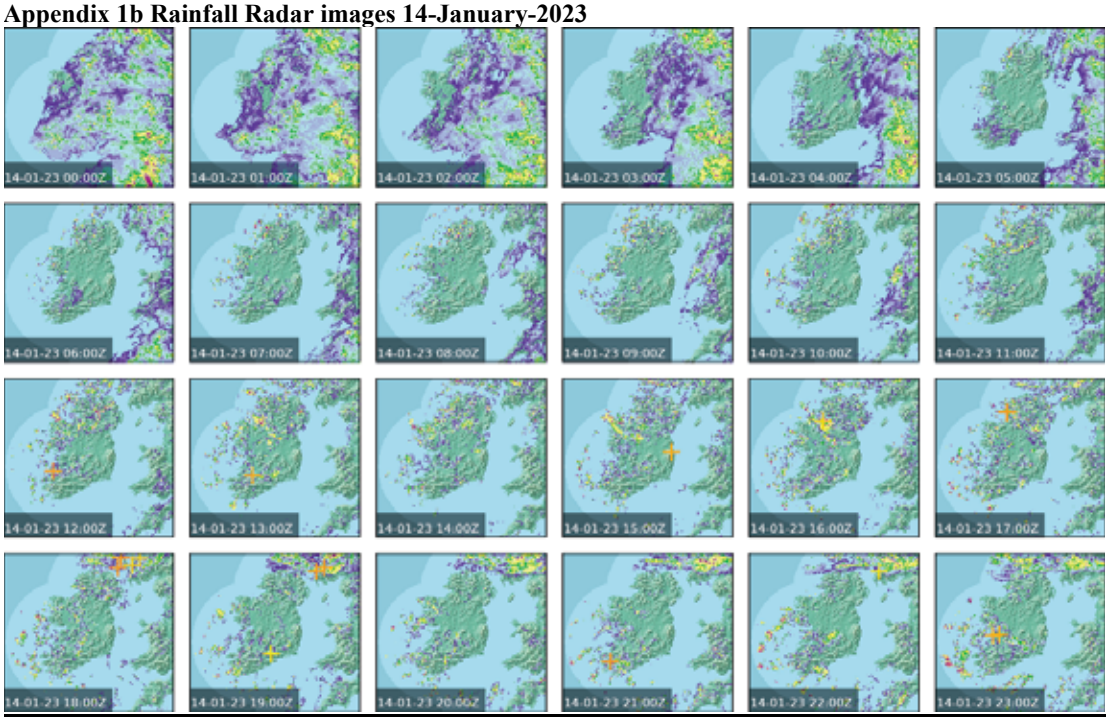
Seirbhísí Aeráide
Cnoc Ghlas Naíon
Baile Átha Cliath 9

Tel: +353-1-8064260
Email: legal@met.ie

Appendix 1a Analysis Chart with Satellite overlay 00UTC 14-January-2023



Appendix 1b Rainfall Radar images 14-January-2023



Appendix 7.3 University of Galway Boat Club – Code of Conduct

UNIVERSITY OF GALWAY BOAT CLUB

CODE OF CONDUCT

2022/2023

OLLSCOIL NA GAILLIMHE
UNIVERSITY OF GALWAY

DATE:	16/09/2022
AUTHOR:	University of Galway Boat Club
APPROVED:	University of Galway Boat Club Committee

Appendix 7.3 University of Galway Boat Club – Code of Conduct

Athlete Code of Conduct

University of Galway Boat Club is fully committed to Safeguarding and promoting the wellbeing of all of its members. Members, coaches, administrators, and others associated with the sport should, at all times, show respect and understanding for the safety and welfare of others. Therefore, members are encouraged to be open at all times and to share any concerns or complaints that they have about any aspect of the sport with their coaches/ committee members. UGBC should offer a positive and inclusive experience to all members where they can learn new things in a safe and positive environment. As a rower within University of Galway Boat Club, you are expected to abide by the following code of conduct.

As a member of University of Galway Boat Club, you will:

- Treat all other members, coaches, officials, competitors and spectators with dignity and respect
- Be familiar with and uphold the UGBC club values, as declared on the Club Values Statement, on and off the river.
- Cooperate fully with others involved in the sport such as coaches, technical officials, spectators, competitors, and fellow athletes
- Act with dignity and display courtesy and good manners towards others. Respect the rights and dignity of all participants regardless of their gender, ability, cultural background, or religion
- Avoid swearing, abusive language and irresponsible behaviour, including behaviour that is dangerous to yourself or others
- Not engage in acts of violence, bullying, harassment or physical or sexual abuse
- Report any suspected misconduct by coaches or other individuals involved in rowing to the Club Captain/ appropriate committee member as soon as possible.
- Report any accidental injury, distress, misunderstanding or misinterpretation to your coach and/ or appropriate committee member as soon as possible.
- Never engage in any inappropriate or illegal behaviour.
- Avoid destructive behaviour and respect club equipment and premises. Be aware of your responsibility to the environment.
- Be familiar with the Rowing Ireland anti-doping policy and comply with this at all times. Report any suspected violations of this policy to an appropriate committee member.
- Be organized. Have the appropriate equipment for training and competitions. Be on time.
- Recognise that there are junior members of UGBC and ensure that your behaviour towards them and in their company is appropriate.

Appendix 7.3 University of Galway Boat Club – Code of Conduct

Coaching Code of Conduct

This University of Galway Boat Club Code of Conduct relates to the professional behaviour of its coaches. The Code aims to promote a high standard of coaching as well as encouraging a positive, safe and inclusive environment in our club. The Code promotes fair and responsible behavior by the coach towards their athletes. Our coaches should support the athletic development of our members while also demonstrating the club values of integrity and sportsmanship.

The following Code of Conduct should be adhered to by all coaches at University of Galway Boat Club.

As a coach of University of Galway Boat Club, you will:

- Act as a good role model
- Encourage and be positive during sessions so that athletes leave with a sense of achievement
- Promote athletes' development regardless of their gender, ability, cultural background, or religion
- Set challenging, realistic but achievable goals.
- Plan and prepare each session appropriately and ensure proper levels of supervision
- Be aware of weather forecast and avoid training in unsafe conditions
- Enforce the principles of fair play treating each athlete equally, with dignity and respect and ensure that all athletes play within the rules.
- Prepare athletes to respond to both success and failure in a dignified manner.
- Promote the values of team spirit and fair-play
- Discourage inappropriate behaviour in training, competition, and away from the sporting arena.
- When conflicts occur among coaches or with athletes, attempt to resolve these conflicts in a responsible and objective manner that respects all parties involved and minimizes disruption.

Any breaches of these Codes of Conduct should be reported to the Club Captain. Persistent misbehaviour may result in dismissal from the Club. Dismissals may be appealed with final decisions taken by the Club Committee or referred to the University of Galway Sports Unit.

Appendix 7.4 University of Galway Boat Club – Emergency Action Plan

Rowing Ireland Emergency Action Plan For University of Galway Boat Club

Emergency Action Plan

EMERGENCY CONTACT INFORMATION

DIAL 911 or 112 FOR ALL EMERGENCIES

BOATHOUSE ADDRESS (H91 EF83)

AFTER dialling 911 and within a reasonable timeframe, please contact representatives of the University of Galway Boat Club on this list. Should the individual not answer the phone, please proceed down the list to the next contact.

President: [redacted]
Captain: [redacted]
Secretary: [redacted]
Safety Advisor: [redacted]

AVAILABLE EQUIPMENT

First Aid Supplies:
☑ Located in the entrance hall of the club house, to the left hanging on the wall

Defibrillator:
Located in Áras na Mac Léinn (Main Foyer) in area 1.

Coach boats must carry at all times:
Mobile phone in dry bag
Rescue Bag (First aid bag, blankets, knife, throw line, whistle)
Paddle
Tow line
Sound signalling device (whistle)

Appendix 7.4 University of Galway Boat Club – Emergency Action Plan

EMERGENCY ACTION PLAN

The actions taken in the first few minutes of any emergency can save life, reduce scale of injury, restrict damage.

As a club member it is important that you familiarise yourself with this document.

Row safe,
Train safe,
Stay safe.

NON-EMERGENCY MEDICAL CARE

No matter how insignificant the injury may seem, driving someone off-site (i.e. to a hospital or medical clinic) carries GREAT MEDICAL RISK to the injured and GREAT LEGAL RISK to the driver. Please call an ambulance or have an immediate family member/legal guardian drive instead.

University Hospital Galway, Newcastle Road, Galway, H91 YR71

ON WATER EMERGENCY SITUATION

What to do in an emergency situation such as a flipped boat in cold water:

Stay with the boat, use it as a flotation device

Make a lot of noise so that you get attention from everyone to come help ***(Continuous blast on the whistle)***

Approach flipped boat from upwind, taking all water and weather conditions into consideration as you approach.

Turn off the engine, gather as many athletes as possible into the coach boat and take them to shore/slip or nearest dry land

Taking athletes to shore is an option if others in the water are in danger; otherwise take athletes to the club

If hypothermia is a concern, athletes should remove clothing and find dry warm clothes; the club house is a smart place to go as it has heat

Parents or emergency contacts should be called so that athletes are looked after

Do not concern yourself with the shell and oars until all athletes are safely looked after

GETTING ATHLETES IN THE COACH BOAT

How to help athletes get into the coach boat from the water without tipping the boat:

MOTOR MUST BE OFF

If athlete is strong enough to climb in on their own, they can do so from the side at the stern as it is lowest in the water. You should be on the opposite of the boat to counter balance the weight distribution

Boat Club, Emergency Action Plan, continued

Appendix 7.4 University of Galway Boat Club – Emergency Action Plan

- If athlete needs assistance then the bow is a smart place to do this as the weight of the motor will help to counter balance the weight distribution
- When you have a guest coach with you have them help athletes out of the water and use yourself to balance weight in the boat to keep you from tipping over

DURING ALL ON WATER EMERGENCIES:
DO YOUR BEST TO GET THE INJURED TO THE CLUB

Alternative emergency services rendezvous points

- Boat Club: University of Galway Boat Club, **H91 EF83**
- Corrib Slip, H91 F78F
- Dangan slip, H91 PH55

Rendezvous Point 1

Rendezvous Point 1

DURING A MASS EVACUATION OF THE WATER EVERYONE SHOULD STAY AT THE BOATHOUSE UNTIL INSTRUCTED BY YOUR COACH AND OR THE CHARGE PERSON TO INSURE WE HAVE A RECORD EVERYONE IS OFF THE WATER

EMERGENCY ACTION PLAN

Roles & Responsibilities

CHARGE PERSON

- The lead coach with the crew/athlete until a more qualified first aider arrives (based on level of training/certification) Could also be an EMS that is also a coach
- CHECKS FOR DANGER TO SELF AND OTHERS
- Assesses ABC's of the individual(s) and decides if advanced medical help is required

Boat Club, Emergency Action Plan, continued

- Ensures the injured is not moved until certain that no serious injury has occurred (as deemed by a medical professional), or immobilizes the individual in case of severe condition
- Directs CALL PERSON to call 9-1-1 if required

Appendix 7.4 University of Galway Boat Club – Emergency Action Plan

- Performs any first aid that is required based on level of training
- Waits with the injured person until EMS arrives and the injured person is transported to a hospital; traveling with the injured person if a family member is not yet on site

CALL PERSON

- Mature responsible person that is nearby with a cell phone
- Calls 9-1-1 for emergency if directed by the CHARGE PERSON
- Provides all information including facility location, nature of injury, what, if any, first aid has been provided
- Stay on the phone with 9-1-1 operator
- Stays with CHARGE PERSON and injured to update 9-1-1 operator about change in condition and until EMS has arrived
- Calls emergency contact person of the injured individual(s)
- Calls Boat Clubs first representative on the list above until a person is contacted

CONTROL PERSON

- Mature responsible person that can control a crowd
- Controls the crowd including concerned athletes, coaches and spectators
- Recruits help at the scene if needed
- Assists the CHARGE PERSON as needed

COURSE PERSON

- Mature responsible person that can move quickly and efficiently
- Ensures the gate is unlocked so that EMS can access the club grounds.
- Go to H91 EF83, to direct EMS to the club house to speed attendance on scene. Inform the emergency dispatcher if you are taking this course of action.

NUIG BC

Prepared by: [redacted]

Risk Assessment NUIG Boat Club			Author: [redacted] Date: Dec 2021			
Reduce probability of a hazard causing a hazardous event			*Reduce the severity of harm*			
Hazard	**Barriers**	**Action to maintain**	**Hazardous event**	**Controls**	**Actions**	**Harm**
Rough water (white horses)	Stay on sheltered water possibly stay on the straights use lager and coxed boats 8+,4+ etc. Keep novice/ inexperienced crews off water and depending on conditions and coach's judgement train on land.	Club captain, coach or senior rower should decide if the conditions are unsafe and follow guidance with criteria for unsafe conditions	Capsize or boats taking on water	Ensure all rowers are competent swimmers and have practiced capsize drill. Ensure safety launch with qualified drivers are on the water. Provide launches with first aid equipment and thermal blankets to carry in the launch. Ensure any crew going out without a launch has notified someone that they are going up river.	Keep a record of all athletes who have completed swim check or capsize drill. Carry out periodic checks on safety equipment carried in the launches. Check launch drivers are up to date with first aid	Rower(s) getting wet and cold, risk of cold-water shock and hypothermia if left for a prolonged time
Fast flow (lots of gates open or after heavy rain)	Stay in tight to Jes bank and do not cross weir making way up river. Use larger boats 4+,4-,8+ etc and keep inexperienced rowers off the water especially in coxless boats.	Captain, coach or senior rower should decide if conditions are safe. Quick spin in launch to check conditions if in doubt.	Crews unable to steer into canal to land at slip	Land at Jes or other slip if flow becomes too strong and steering is an issue.	Provide information to coaches and launch drivers on how to tow boats back if athletes must slip at Dangan or Corribe if conditions become unsafe	Rowers become tired or frightened also possibility of capsizing
Bad weather (very wet, wind or fog)	Cancel rowing if conditions are unsafe. If session take place make sure to take necessary precautions, ensure all athletes have adequate	Coach should decide if conditions are unsafe and appropriate measures to take e.g. appropriate clothes, lights	Boats taking on water, capsize, collision	Ensure safety launches are stocked with first aid kit/ thermal blankets and ensure launch drivers are qualified	Ensure swim test and capsize drill records are up to date. Maintain equipment.	Rowers get cold/ wet, risk of hypothermia. In case of collision risk of impact injury e.g. back injury.

Appendix 7.5 University of Galway Boat Club – Risk Assessment

NUIG BC

Prepared by [redacted]

	gear/layers. In fog wait for it to clear and use lights on boats when visibility improves.						
Hot weather	If temperatures are high avoid outings in hottest parts of the day	Coach should make call if training time needs to be changed	Rowers could suffer from heatstroke or dehydration	Ensure rowers wear hats and sun cream and carry drinking water with them	Notify rowers to ensure they are aware to bring hats etc.	Rowers could become he hydrated
Low water levels	Avoid the centre of the river coming down from bridge to the club (rocks) avoid banks at shallow points (from castle to top of straights and rock heading up river after reeds before iodine)	Remind coxes and athletes in coxless boat to be aware of shallow water and potential rocks or other debris protruding	Boats could run over rock or run aground Risk of capsize	Ensure coxes are aware of the shallow points in low water. Ensure a launch is present on the water	Maintain first aid equipment in launches. Notify club when water levels are particularly low	Risk of damaging boats or equipment Risk of sinking
Other boats on the river	Rowers comply with navigational rules of the river always sticking to bow side and sticking to markers on the lake But also, always keeping a good lookout	Navigation rules in the boat house and all coxes and new members to be made aware	Collision with another boat on the river	Rescue using buddy rescue, assessing damaged boats and repairing boats	Maintain first aid equipment and trained first aiders. Maintain boat repair. And ensure athletes are aware of buddy rescue.	Capsize, injury, boat damage
Motorised boats on river (launches, fishing boats during competitions, Corrib princess etc.)	Rowers comply to navigational rules and keep a good look out especially during the summer months (corrib princess)	Navigational rules on display in boathouse and reminder to keep lookout also	Collision with a motorised boat	Rescue and repair of equipment	Maintain equipment and have trained first aiders at the club	Capsize, injury, boat damage
Biological contamination of the water	Rowers should avoid skin contact with the water, cuts and open blisters should be kept	Members and new members should be provided with information	Contact with biological contamination of the water	Availability of showers and washing facilities. Antibacterial wash. If rowers are in doubt	Information provided to rowers	Water borne diseases e.g. Weil's disease or other infections

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Appendix 7.5 University of Galway Boat Club – Risk Assessment

NUIG BC [redacted] Prepared by:

	covered and cleaned after			the should seek medical attention		
Boat handling	Ensure all rowers and new members are aware of correct boat handling	Coaching and information displayed in the boathouse	Injury caused by boat handling on land	Provision of first aid and assessment of boat damage	Maintain first aid training and boat repair	Minor injury and potential damage to boats.
Medical conditions of rowers			Illness or collapse of a rower	Stop rowers who are likely to collapse training in 1x, provide safety launches and first aid, keep record of serious medical conditions of rowers	Provide information to coaches and maintain first aid and give details of health problems	Unknown health effects, possible further harm
Gate not correctly closed	Check boats before every session and emphasize the importance of this to novice members	Notice and remind rowers	Oar could come out of gate	Capsize drill especially for 1x	Safety launches on river and up to date first aid	Capsize
Trailer loading and unloading	Train members in how to load, unload and tie boats	Briefings and reminders to members. Boatswain to check tying and to show how to re-tie correctly if necessary	Injury causing when lifting, climbing trailer and loading boats	Provision of first aid and quarantine and assessment of damaged boats	Maintain first aid training, and equipment, maintain boat repair skills	Minor injury, potential damage to boat
Trestling boat in bad weather	Keep supervised at all times do not leave unattended	All athletes responsible to supervise boats	Boat blowing off trestle causing damage	Quarantine and repair of damaged boats	Maintain boat maintenance skills	Damage to boat
Transport of boats by road	Care by jeep drivers ensuring all boats are secure and jeep lights working at rear	Information and guidance to drivers and maintenance of trailer	Collision when transporting boats	Provision of first aid and assessment of boat damage	Maintain first aid training and ensure jeep driver is always accompanied and that driver has adequate qualifications	Potential injury to passengers, damage to boats
Gym hazards: Misuse of equipment Defective equipment		Coaches should supervise athletes while using the gym equipment and teach them how to lift weights	Harm to equipment or persons in the gym	Have a trained weights coach in the gym while athletes are training and check the equipment in the gym always before use	Keep a record of faulty gym equipment and report any injuries sustained while using any gym equipment	Athletes get injured or harmed due to use of gym equipment

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Appendix 7.5 University of Galway Boat Club – Risk Assessment

NUIG BC

Prepared by [redacted]

Poor Swimming ability	Club capsize drill completed so coaches can see the competency of athletes in the scenario of a capsize	and maintain the equipment correctly Coaches, club captain and health and safety officer should decide if athletes are safe in the water in the event of a capsize and if not, train said athletes in safety measures/procedures	Rower panicking in the water or unable to perform correct safety measures once in the water	Have a safety launch with athletes at all times and ensure rowers have completed the club capsize drill and showed competency in the situation	Keep a record of all capsize incidents and if any harm towards athletes or equipment	Rowers get hypothermia, go into shock or possible death by drowning
Novice/Inexperienced rowers	Keeping a safety boat to rowing boat ratio of 1:2	Coaches and Novice coaches make sure that safety launches go out with novice crews Coaches stay vigilant and monitor weather to ensure the water is safe to row on	Rowers fall into the water and panic The boat gets caught at the gates by the weir	Teach novices what to do in event of a capsize. Keep novices in larger boats Do not send out novices in too high winds or flow Keep a safety launch with the rowers	Keep a record of novices who have attend capsize drills. Record any incidents on the water regarding inexperienced rowers.	Inexperienced rowers could go into shock Death, drowning

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Appendix 7.6 Rowing Ireland – Advisory Note 1 February 2023

Rowing Ireland Safety — Flatwater DRA

Safety Advisory Committee

Advisory Notice. 1/Feb/23 FW

Flatwater Dynamic Risk Assessment

This dynamic risk process takes just five minutes to complete, it could save a life!

Is it safe to go on the water?

Every day in Ireland we have enthusiastic and dedicated coaches taking crews on the water. Whether this is for a recreational spin, high performance session, training session, introduction session or a competitive race, as a coach, you are the person that takes responsibility and makes the final decision. Is it safe to go or not? Over your career as a coach you may have made this decision hundreds of times, your training, knowledge and experience helps you to make an informed decision about going on the water. This document assists in putting a formality into how you arrive at your decision.

First and easiest question to ask yourself;

Will the targets I have set for the crew in this session, still be achievable in these conditions?

If NO! then don't Row!

Item	Observation	Yes	No
1.	All crew available?	___	___
2.	Are the crew's skill level appropriate for conditions?	___	___
3.	Are the crew dressed appropriately for the conditions?	___	___
4.	Is the boat the appropriate type for the crew?	___	___
5.	Is the boat in a safe and operational condition?	___	___
	- Bow ball in place. - Heel ties in place and functioning correctly. - Hatch covers in place and secure. - Quick foot release mechanism on all shoes. - All bolts tight and secure. - All gates functioning correctly. - Hull in good condition free from punctures, cracks and holes. - Appropriate warning lights if rowing at night.		

FOR ADVICE ON ANY SAFETY MATTERS EMAIL clubsupport@rowingireland.ie

TO REPORT ANY INCIDENTS PLEASE USE THE ROWING IRELAND iROWSAFE ONLINE REPORTING SYSTEM link here. "SEE IT, REPORT IT, IMPROVE IT".

1

Appendix 7.6 Rowing Ireland – Advisory Note 1 February 2023

ROWING IRELAND

Rowing Ireland Safety	Flatwater DRA	
6. Is there a safety launch/coaches launch available? - Bung in place. - Enough fuel for duration of the session. - Engine checked (serviced regularly). - Kill cord in pace. - Oars. - Bailer. - Life jacket for all occupants. - Communication device (radio, mobile phone). - Anchor. - Safety Bag (with), - - Throwline, safety knife, foil blankets, first aid kit, whistle, torch.	___	___
7. Is the launch crewed by competent persons?	___	___
8. Will the weather conditions be favourable for the entire session? Wind speed_____ Direction _____ Flow state_____ Tide_____	___	___
9. Is it safe to launch and recover boat from this location?	___	___
10. Is the Coach/Cox wearing the appropriate PFD?		
11 Are the crew familiar with the location and the risks and hazards that may be present?	___	___
12. Is the crew and coaches familiar with the club EAP (Emergency Action Plan)?	___	___
13 Is someone on shore aware of the start time and expected finish time of the session (Designated Person Ashore) DPA?	___	___
14. Is someone on shore aware of the location where the session will take place?	___	___
15 If I am a land-based coach, do I have a throwline?		
16. If I am a land-based coach, has the coach and crew considered what to do in the case of an emergency?	___	___
17 At the end of the session will I report all unsafe incidents to the club and on the online iROWsafe Rowing Ireland incident reporting system?	___	___
18. At the end of the session will I report all defects or damage of the boat or equipment, to the appropriate club person?	___	___

If you answer NO to any of the above question you should re-evaluate the planned session and stay ashore!

IF NO, THEN DON'T ROW!

FOR ADDITIONAL GUIDANCE PLEASE REFER TO THE

CODE OF PRACTICE: THE SAFE OPERATION OF RECREATIONAL CRAFT

ROWING IRELAND SAFETY MANUAL

FOR ADVICE ON ANY SAFETY MATTERS EMAIL clubsupport@rowingireland.ie

TO REPORT ANY INCIDENTS PLEASE USE THE ROWING IRELAND iROWSAFE ONLINE REPORTING SYSTEM link here. "SEE IT, REPORT IT, IMPROVE IT". 2

Appendix 7.7 Code of Practice: The Safe Operation of Recreational Craft

1.5.2.2 Recreational craft less than 13.7 metres in length

There are currently no statutory fire appliance requirements for recreational craft less than 13.7 metres in length. However, it is strongly recommended that such vessels carry at least a minimum standard of fire appliances and guidance on this is given in Part B of this Code.

1.6 Inland Waterways and Canal Systems

Inland waterways comprise the navigable sections of the larger rivers, the canal network and lakes. Conditions on inland waterways are generally not as severe as those experienced in coastal regions. For the purposes of this Code, inland waterways refer to non-tidal and/or fresh water. There are a number of different authorities with a role in managing navigable inland waterways in the State. There is more detail on these authorities in Chapter 3.

In Ireland, Waterways Ireland has responsibility for the Shannon Navigation, the Grand Canal, the Royal Canal, the Barrow Navigation and the Shannon Erne Waterway. The Corrib is managed by the Corrib Navigation Trustees. Parts of other waterways come under the jurisdiction of the relevant Harbour Authority and still others (e.g. the Slaney) have no navigation authority per se but may be subject to local authority bye-laws. Appendix 3 provides further information in relation to buoyage and marking schemes on some inland waterways.

1.6.1 Shannon Navigation Acts and associated Bye-Laws

Relevant legislation for the Shannon system:

- Shannon Navigation Acts 1990 and 2005
- Shannon Navigation (Construction of Vessels) Bye-Laws 1992 (S.I. No. 79 of 1992)
- Shannon Navigation Bye-Laws 1992 (S.I. No. 80 of 1992), as amended.

The above legislation applies to any recreational craft based on the Shannon waterway, including lakes and tributaries.

S.I. No. 79 of 1992 specifically refers to vessel construction requirements, the safety equipment required to be carried, engine installations, Liquid Petroleum Gas and cooker installations. S.I. No. 80 of 1992 defines authorised officers and their powers, speed limits, maximum drafts, rules of navigation, crewing levels, use of facilities and groundings.

All vessels operating on the Shannon Navigation must be

Appendix 7.7 Code of Practice: The Safe Operation of Recreational Craft

registered with Waterways Ireland as set out in Bye-Laws 5 and 6 of the Shannon Navigation Bye-Laws 1992 (S.I. No. 80 of 1992).

A "vessel" is defined as any craft that is not:

- an open boat or undecked punt
- a canoe, skiff, skull
- a row boat
- a boat designed to be propelled primarily by oars or sail
- propelled by engine greater than 15 horsepower.

The bye-laws were amended in 1994 to prevent the discharge of sewage directly into the navigation from any vessel.

1.6.2 Navigation on the Shannon

The Shannon Navigation Bye-Laws (S.I. No. 80 of 1992) identify the rules to be followed by craft navigating the Shannon waterways.

While similar in content to the COLREGS, there are a number of additional specific rules that apply.

- Vessels shall not run abreast or overtake in any part of the navigation less than 13 m in width.
- Vessels navigating **with** the stream shall be given precedence for passage through a bridge by those craft navigating against the stream of the river.
- Boats should keep to the starboard side of the fairway passing port to port.
- A craft proceeding upstream must give way to those going downstream.
- Speed limits are to be adhered to as laid down in the Bye-laws.
- On entering the Shannon Navigation, the direction of Buoyage is **Northwards**.

Buoys, Beacons and Perches are painted **Red** on the **Port** hand and **Green** on **Starboard** hand when proceeding upstream. Navigation marks are not lit on the Shannon.

On the Shannon Erne Waterway east of Lough Scur, the marking system changes to a system of red marks with white flashes where the white flash indicates the safe side. The Corrib system uses a red and green lateral buoyage system which is the same as that on the Shannon.

1.6.3 Canal System Navigation

Navigation on the Royal and Grand Canals is controlled by bye-laws passed under the Canals Act 1986 and 2005. Please contact Waterways Ireland for further details on these bye-laws.

1.6.4 Navigation on the Corrib System

The Lough Corrib Navigation Trustees are responsible for the maintenance of navigation aids and a limited number of piers on the

Appendix 7.7 Code of Practice: The Safe Operation of Recreational Craft

Corrib system, maintenance of the Eglinton canal system, associated walkways, tow paths, lock gates and boundary walls.

1.7 Maritime Safety Act 2005 (No. 11 of 2005), as amended

One of the primary purposes of this Act is to strengthen the law against improper use of certain recreational craft, to outlaw reckless behaviour in operating or on board vessels and to promote good practice in operating vessels generally. The Act also updates safety regulation-making provisions for passenger boats, fishing vessels and pleasure craft, and updates penalty and other provisions of certain related Acts.

The main provisions of the Act which affect recreational craft are as follows:

Part 2 Personal Watercraft and Recreational Craft

The main provisions of this Part are:

- Clear powers for local authorities, Waterways Ireland, harbour companies, Iarnród Éireann and, in respect of the six fishery harbour centres, the Minister for Agriculture, Food and the Marine, to make bye-laws to regulate and control the use of jet skis and other fast powered recreational craft.
- The appointment by local authorities, Waterways Ireland, harbour companies, Iarnród Éireann and, in respect of the six fishery harbour centres, the Minister for Agriculture, Food and the Marine, of authorised persons to enforce the provisions of the Act. The Garda Síochána also play a key role in enforcement.
- The seizure, detention and forfeiture of craft involved in serious offences and the disqualification of serious offenders from operating the craft in question in the interest of public safety and heritage protection.
- Fines of up to €2,000 on summary conviction for bye-law contraventions.

The Local Government Management Agency website provides links to the individual websites for each local authority area – www.lgcsb.ie/en/irish-local-government. It is recommended that checks are made with the relevant local authority for information on the beach bye-laws that may apply in that county.

Appendix 7.7 Code of Practice: The Safe Operation of Recreational Craft

Inland waterways comprise the navigable sections of the larger rivers, canal network and lakes. Conditions on inland waterways are generally not as severe as those experienced in coastal regions. However, they present their own unique set of hazards. Difficulties such as locks, open weirs, strong flows in confined spaces, narrow bridges, relatively shallow water and, in the case of the larger lakes, significant wave and wind forces, may present a danger to small craft. For the purposes of this Code, inland waterways refer to non-tidal and/or fresh water.

There are a number of different authorities with a role in managing navigable inland waterways in the State. Some of them are listed below:

Waterways Ireland is a North/South body with responsibility for the management, maintenance, development and restoration of over 1,000 km of inland navigable waterways, principally for recreational purposes. Special Marine Notice No. 1 of each year issued by Waterways Ireland gives an overview of general guidelines to the inland waterways under their remit.

Waterways Ireland has responsibility for the following:

- Barrow Navigation
- the Grand Canal
- the Royal Canal
- the Shannon-Erne Waterway
- the Shannon Navigation.

The Lough Corrib Navigation Trustees have responsibility for the following inland waterways:

- Corrib system
- Eglington Canal system

An Taisce is responsible for the Boyne Navigation.

Kerry County Council is responsible for the Tralee Ship Canal.

Other waterways may be under the administration of the relevant local authority/county council. Please check directly with them for further details.

3.1 Training

It is recommended that persons participating in sail and motorboat craft activities undertake appropriate training. A number of training schemes and approved courses are available and information can be obtained directly from course providers.

For the purpose of this Code, sailboats and motorboats are

Appendix 7.7 Code of Practice: The Safe Operation of Recreational Craft

classed in six categories, four of which refer to coastal water and are covered in Chapter 2. The remaining two categories are dealt with in this Chapter.

3.2 Recommended minimum safety equipment – Inland Waters

Boat owners should be aware of the category that applies to their vessel, based on its intended usage and area of operation, and ensure it is equipped with the required safety equipment. The following paragraphs provide a description of two vessel categories. Table F recommends the type and quantity of equipment that each category of craft should carry in the respective operating areas.

3.2.1 Category E

Craft that:

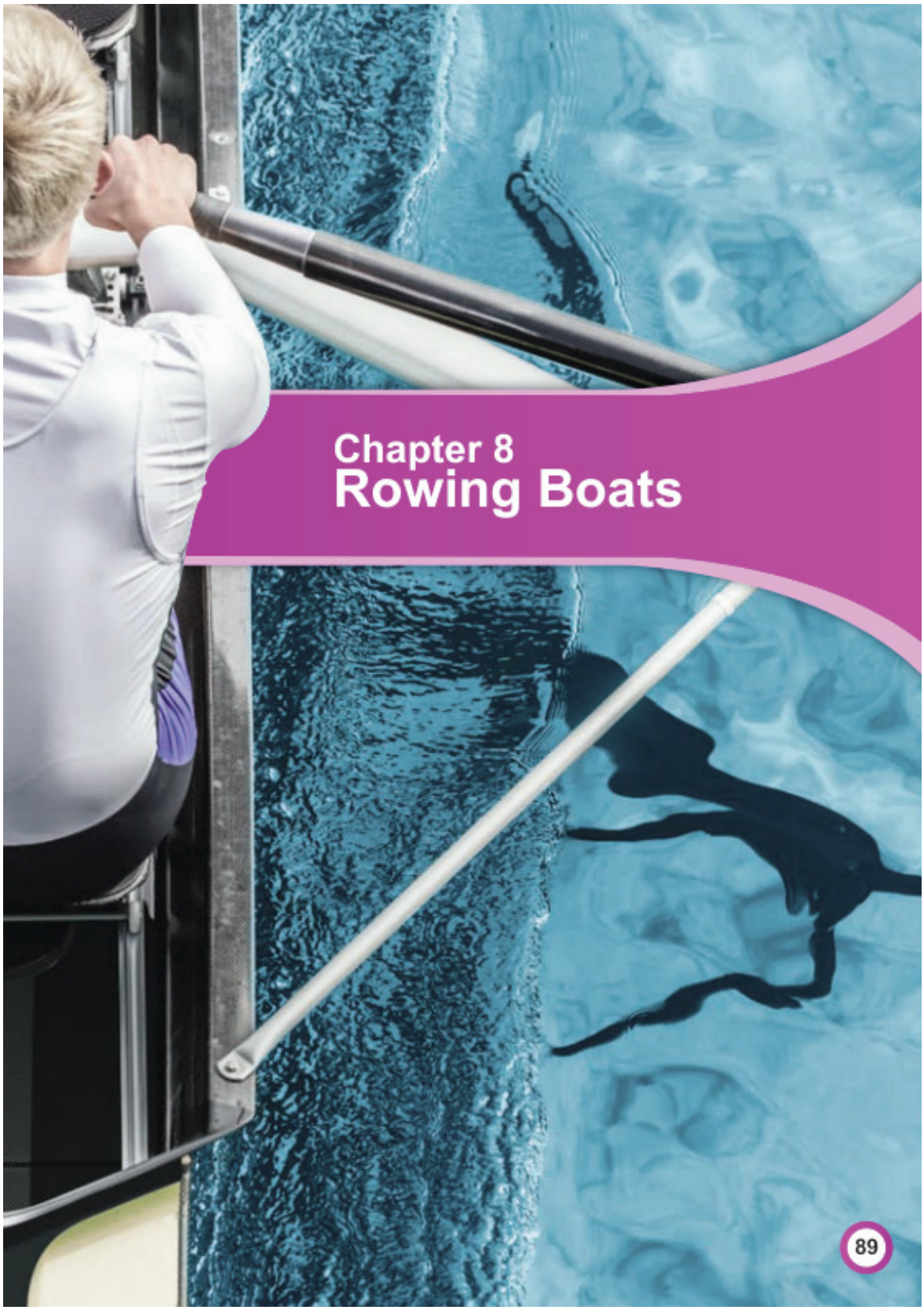
- Are capable of operating on the larger exposed lakes in extreme weather conditions;
- Have accommodation and can be used for overnight habitation;
- Are capable of extended voyages.

3.2.2 Category F

Craft that:

- Are open boats without shelter for occupants and generally less than 7 metres in length;
- Operate locally on rivers and sheltered sections of lakes.

Appendix 7.7 Code of Practice: The Safe Operation of Recreational Craft



Appendix 7.7 Code of Practice: The Safe Operation of Recreational Craft

8 Rowing Boats

Rowing includes "Olympic Style" rowing boats, racing gigs/skiffs and traditional racing currachs.

8.1 Training

It is recommended that rowers undertake appropriate training. A number of training schemes and approved courses are available and information may be obtained directly from course providers including Rowing Ireland (see Appendix 9 for details of course providers).

8.2 Olympic style rowing boats

These boats are used in the rowing events in the Olympic Games and are governed in Ireland by Rowing Ireland. The following safety points should be adhered to at all times.

A coach and/or a safety boat should be in attendance at all times. Operators of such safety boats should be suitably qualified and boats should be suitably identified by markings or warning flags to alert other craft in the area that there are rowing boats on the water.

Coach/safety boats should carry the following items of equipment:

- Suitable bailer
- Suitable inflatable pump – if an inflatable is used as a rescue boat
- A throw bag with at least 10 m of buoyant line
- A sound signalling device – air or aerosol power klaxon
- Thermal exposure blankets
- Lifebuoys or additional PFD/lifejackets to assist persons in the water
- Suitable First Aid Kit
- Anchor and line
- Knife
- Engine Kill Cord to be used by the engine operator
- Paddle
- Suitable handholds fixed to the side of the boat – to assist persons being rescued.

All participants should be aware of the requirements set out in the Rowing Ireland Water Safety Code.

8.3 Boat construction and equipment

- All rowing equipment should be kept in good order and inspected regularly.
- Buoyancy compartments located in bow and stern must be checked to ensure they are in good order and will function as intended. Boats should be handled carefully and correctly at all times when out of water to avoid damage to hulls or injury to crews or spectators.
- Boats, when placed on water and prior to crew embarking, should be checked to confirm they are safe, free of leaks and all moving parts are functioning.
- Restraints and quick release

Appendix 7.7 Code of Practice: The Safe Operation of Recreational Craft

mechanisms must be in good working order on boats equipped with fitted shoes. The use of Velcro straps on fixed shoes, as opposed to lace-ups, is recommended.

- Check ventilation bungs are in position and that outriggers, swivels, seats, etc. are secure.
- Ensure all steering mechanisms are working.
- Sculls and oar buttons should be checked to ensure they are secure and properly set.
- Coaching launches should be on the water at all times when rowing craft are in use. Unescorted outings are not encouraged and, if undertaken, a designated person ashore should be aware of departure times, destinations and return times.
- All persons participating should be in good health and capable of swimming 100 m while wearing light clothing.
- All boat coxswains should wear an approved PFD/lifejacket at all times.

Boats should not be used at night unless they comply with the requirements of the International Collision Regulations regarding navigation lights. Boats should not be operated in weather or tide conditions that may compromise their low freeboard and stability.

8 Rowing Boats

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Appendix 7.7 Code of Practice: The Safe Operation of Recreational Craft

Coaches, coxswains and crew should at all times be aware of local navigation rules, including any possible hazards or potential dangers arising from tidal, stream or wind that may prevail locally. When racing in competitions, the Water Safety Code of Rowing Ireland is to be adhered to fully.

8.4 Coastal racing gigs/Traditional racing currachs

- Crew engaged in racing these boats should wear a suitable PFD/lifejacket at all times.
- Boats should be equipped with a means of attracting attention (Aerosol Klaxon).
- Coaches/Crews should not operate these boats in waters that are beyond the capabilities of the crew or boats.
- Coaching/Rescue boats that are in attendance should be suitably equipped and be operated by competent operators.

8.5 National Associations

Rowing Ireland is the governing body for rowing in Ireland and represents over 100 clubs across Ireland (See Appendix 10 for contact details).

The Irish Coastal Rowing Federation is a governing body for coastal rowing in Ireland (see Appendix 10 for contact details).

SECTION 36 PROCESS

Section 36 of the Merchant Shipping (Investigation of Marine Casualties) Act, 2000

It is a requirement under Section 36 that:

(1) Before publishing a report, the Board shall send a draft of the report or sections of the draft report to any person who, in its opinion, is likely to be adversely affected by the publishing of the report or sections or, if that person be deceased, then such person as appears to the Board best to represent that person's interest.

(2) A person to whom the Board sends a draft in accordance with subsection (1) may, within a period of 28 days commencing on the date on which the draft is sent to the person, or such further period not exceeding 28 days, as the Board in its absolute discretion thinks fit, submit to the Board in writing his or her observations on the draft.

(3) A person to whom a draft has been sent in accordance with subsection (1) may apply to the Board for an extension, in accordance with subsection (2), of the period in which to submit his or her observations on the draft.

(4) Observations submitted to the Board in accordance with subsection (2) shall be included in an appendix to the published report, unless the person submitting the observations requests in writing that the observations be not published.

(5) Where observations are submitted to the Board in accordance with subsection (2), the Board may, at its discretion -

(a) alter the draft before publication or decide not to do so, or

(b) include in the published report such comments on the observations as it thinks fit.

The Board reviews and considers all observations received whether published or not published in the final report. When the Board considers an observation requires amendments to the report, those amendments are made. When the Board is satisfied that the report has adequately addressed the issue in the observation, then no amendment is made to the report. The Board may also make comments on observations in the report.

Response(s) received following circulation of the draft report (excluding those where the Board has agreed to a request not to publish) are included in the following section.

The Board has noted the contents of all observations, and amendments have been made to the report where required.

8. MSA 2000 – SECTION 36 OBSERVATIONS RECEIVED

Note: The names and contact details of the individual respondents have been obscured for privacy reasons.

8.1 Correspondence from Lough Corrib Navigation Trustees and MCIB response

CITY HALL
COLLEGE ROAD
GALWAY

HALLA NA CATHRACH,
BOTHAR AN CHOLAISTE,
GAILLIMH

Telephone no. 091-536484

1st February 2024

Marine Casualty Investigation Board (MCIB)
Leeson Lane
Dublin 2,
Ireland

LOUGH CORRIB NAVIGATION TRUST OBSERVATIONS ON MCIB DRAFT REPORT TITLED-

'REPORT OF AN INVESTIGATION INTO A MARINE INCIDENT INVOLVING MULTIPLE ROWING VESSELS IN OR AROUND SALMON WEIR, RIVER CORRIB, CO GALWAY ON OR ABOUT 14 JANUARY 2023'

To Whom it Concerns,

This is Lough Corrib Navigation Trustees observations on the draft report issued by MCIB.

"The Trustees of the Lough Corrib Navigational Trust operate within the provisions of the Lough Corrib Navigation Act of 1945 which does not provide the Trustees with the mandate or the statutory powers to enable them to implement the recommendations of the MCIB as set out at clause 6.6 of the report. In such circumstances, the Trustees request that the said recommendations be directed to the Office of Public Works who as is noted at clause 2.4.1 of the report have full and active control of the Salmon Weir in Galway City"

Yours Sincerely

[redacted]

Lough Corrib Navigation Trustees

MCIB RESPONSE: The MCIB notes the contents of this observation.

8.2 Correspondence from Rowing Ireland and MCIB response

H[redacted]

Thank you for sharing the draft report titled. **"Report of an investigation into a marine incident involving multiple rowing vessels in or around salmon weir, river Corrib, Co. Galway on or about 14 january 2023"**

I found the report to be a fair and accurate assessment of my knowledge of the incident and matter discussed within the document.

I only have a few comments to make on the report.

Page 22, 2.6 Rowing Boats

2.6.3 & 2.6.4 are incorrect descriptions of the boats involved and do not match with the pictures (Example in figure 19) and (Example in figure 20).

The pictures are correct, but the description in 2.6.3 and 2.6.4 are incorrect.

2.6.3 Should reflect the coxed four shown in example in figure 20, on page 23

2.6.4 Should reflect the coxed quadruple shown in example figure 19 on page 23

In a number of places within the report the term "Safety Officer" is used. Within Rowing Ireland and its affiliated clubs the term used is Safety Advisor.

The chair of the Rowing Ireland safety Advisory committee is known as the Rowing Ireland Safety Advisor.

Page 92
6. Safety Recommendations

6.1 Safety Changes Enacted,
Section 1, point f., 'Safety Officer', this should read 'Safety Advisor'.

6.2 Recommendations to the University of Galway Boat Club
Section 1, point c. page 94 'Safety Officer', this should read 'Safety Advisor'.
Section 1, point f. page 94 'Safety Officer', this should read 'Safety Advisor'.
Section 2, point a. page 94 'Safety Officer', this should read 'Safety Advisor'.

Please also note that the Chief Executive Officer [redacted] of Rowing Ireland, [redacted] is currently on Bereavement leave and may not have returned before the deadline for comments to this report.

I am currently acting in her position within Rowing Ireland.

Yours

[redacted]
Acting Chief Operation Officer
Rowing Ireland

As addressed in the official letter containing this draft report

[redacted]
Chair of the Safety Advisory Committee
Rowing Ireland
The Courtyard, Sports Ireland
National Sports Campus
Snugborough Road
Blanchardstown
Dublin 15 D15 PNON

--

ROWING IRELAND

[redacted]
Acting Chief Operations Officer Rowing Ireland

[redacted]
clubsupport@rowingireland.ie
www.rowingireland.ie
National Rowing Center, Farran Woods, Co. Cork, Ireland

MCIB RESPONSE: The MCIB notes the contents of this observation.

8.3 Correspondence from University of Galway and MCIB response

Hi [redacted]

Thank you very much for the comprehensive report. The information is of great value to us in the University of Galway and will be of great help to us in improving how our rowing club operate going forward.

Regards

[redacted]

[redacted]
Acting Director of Sport
University of Galway
[redacted]

Ollscoil na Gaillimhe
University of Galway

MCIB RESPONSE: The MCIB notes the contents of this observation.

Leeson Lane, Dublin 2.
Telephone: 01-678 3485/86.
email: info@mcib.ie
www.mcib.ie