



NORTH BERWICK HARBOUR TRUST ASSOCIATION



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Navigation Risk Assessments

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1. Introduction to North Berwick Harbour Navigational Risk Assessment: -

The North Berwick Harbour Navigational Risk Assessment document has been compiled to formally identify all the marine hazards both commercial and leisure within the jurisdiction of the Harbour to support the Safety Management System (Port Marine Safety Code). A full assessment of the hazards has been carried out against a standard of acceptability. Where appropriate, risk reducing control measures have been put in place to eliminate or reduce the risk to as low as reasonably practicable (ALARP). In order to fully examine the hazards and risks, external stakeholders with specific skills and knowledge have been included in the process.

As with any Safety Management System, we have a robust monitoring and review system in place within the Port Marine Safety Code to fully support the validity of the Navigation Risk Assessment document.

For the purposes of this document the definition of “hazard” and “risk” are detailed below.

“Hazard”: A potential source of harm, loss or injury.

“Risk”: The probability of suffering harm or loss and is a measure of the frequency and consequence of a particular hazard.

Following stakeholder consultations, the following Generic Marine Hazards were identified.

1.1 Generic Marine Hazards

1. Fire – potential for injury to persons and property.
2. Collision with fixed object – vessel making contact with a fixed object, either Harbour infrastructure or moored vessel
3. Collision with another vessel whilst underway.
4. Bunkering/pollution – potential for oil pollution.
5. Breakout – vessel moorings or anchor failure
6. Diving – diving operations becoming compromised.
7. Swimming incident – swimmers becoming compromised.
8. Grounding – Vessel making contact with sea bed or underwater obstruction.

Operating within the harbour we have the following three vessel types. Whilst all three are exposed to the same hazards, each have their unique risk levels, requiring the equivalent unique control measures to mitigate the risk.

1.2 Vessel Types

1. Trip vessels.
2. Commercial fishing.
3. Leisure and Small Craft Under 12m.

For the purposes of North Berwick Harbour Navigation Risk Assessment, the methodology adopted is as described below.

1.3 North Berwick Harbour Navigational Risk Assessment Methodology

Risk is assessed by first assigning a value to the likelihood of the event (within the next 5 years) and then to the most likely severity of the consequence for the four categories; People, Operational/Property, Environment and Media/Reputation. The two values are multiplied and form the Risk Matrix. Finally, the Risk Matrix score is assigned one of the five colour coded classifications, Slight, Minor, Moderate, High and Intolerable. The Risk Classification indicates the magnitude and acceptability of the risk and determines whether the task can be performed and when additional mitigating control measures are required to bring the risk to ALARP (As Low As Reasonably Practicable) principles.

Likelihood

Level	Likelihood within next 5 years
1	Remote - may occur in exceptional circumstances.
2	Unlikely - could occur but doubtful.
3	Possible - Uncommon but known to occur.
4	Likely – Likely to occur sometime in the next 1-2 years.
5	Almost certain – Common or repeating experience which occurs most years.

Severity

Level	People
1	First Aid Medical treatment, no lost time.
2	Injury requiring minor professional intervention, self cert lost time.
3	Injury requiring hospital stay, some irreversible damage, reportable with less than 2 weeks off. Or MAIB reporting off more than 3 days.
4	Major or permanently disabling injury. HSE or equivalent enquiry, lost time greater than 2 weeks.
5	Fatal injury, possible large number of victims. Police investigation.

Level	Operational/Property
1	No damage to vessel or structure.
2	Minor damage to vessel or structure.
3	Moderate damage to vessel or structure requiring repairs to return to service.
4	Major damage to vessel or structure requiring long term repairs to return to service.
5	Very serious damage with possible criminal proceedings.

Level	Environment
1	Reported but no confirmed impact or lasting effect.
2	Tier 1 spill, limited and local impact, recovery within six months.
3	Tier 2 spill, medium impact, recovery longer than six months.
4	Tier 3 spill confined to harbour. Major impact on ecosystem. Loss of commercial/recreational use, recovery longer than six months.
5	Tier 3 spill not confined to harbour. Major impact on ecosystem. Loss of commercial/recreational use or conservation interest, recovery longer than three years.

Level	Media/Reputation
1	No coverage.
2	Local coverage.
3	Regional coverage.
4	National coverage, local government intervention, major customer intervention.
5	International coverage, government intervention, major stakeholder withdrawal.

Risk Matrix

Likelihood	Level 1	Remote	1	2	3	4	5
	Level 2	Unlikely	2	4	6	8	10
	Level 3	Possible	3	6	9	12	15
	Level 4	Likely	4	8	12	16	20
	Level 5	Almost Certain	5	10	15	20	25
		Severity	Level 1	Level 2	Level 3	Level 4	Level 5

Risk Classification

Score	Classification	Definition
1 – 2	Slight	No action required.
3 – 4	Minor	No additional control measures required. Monitor for changes.
5 – 9	Moderate	Task can be performed under supervision of responsible person. Risk reduction plan to be created to affect ALARP principles
10 – 14	High	Task can only be performed after further additional Risk Assessment and authorisation of Harbour Master. Risk reduction plan to be created to affect ALARP principles.
15 – 25	Intolerable	Task is not authorised under any circumstances.

The risk is first calculated for all four categories assuming no control measures in place and this is the **‘Inherent Risk’**. The control measures are then applied to reduce the risk to ALARP and re-calculated for all four categories, which gives the final **‘Residual Risk’**.

The risk assessment process will individually classify the 9 generic marine hazards, as they relate to the 3 vessel types. In addition, the 3 vessel types will be individually classified in relation to the generic marine hazard of potential collision with each other.

2. Navigation Risk Assessment Control Measure Library:

Number	Control Measure
1.	Passage Planning commercial trip vessels. IMO Guidelines.
2.	Passage Planning commercial fishing vessels. IMO Guidelines.
3.	Passage Planning Leisure Craft. RYA schemes and IMO Guidelines.
4.	Speed restriction in the fairway. Management Rules.
5.	Speed restrictions entering harbour to minimise risk of berth surge. Management Rules.
6.	Speed restriction in Harbour. West Bay area. Management Rules.
7.	Weather restrictions. Harbour mouth booms utilised. Harbour Closure.
8.	Published depths.
9.	North Berwick Harbour Local Notice to Mariners.
11	North Berwick Harbour Emergency Response Plan.
12	North Berwick Harbour Oil Spill Plan.
13	Bunkering and Pollution Prevention
14	Individual vessel risk assessments for all commercial trip vessels.
15	UK Maritime Legislation, STCW Training and including statutory fire and abandon ship drills.
16	SEPA Flood alerts/negative tidal surge warnings.
17	Height of water information from harbour mouth measuring gauge.
18	IMO guidelines. International Regulations for Preventing Collisions at Sea, 1972 (COLREGs)
19	Mooring training and procedures.
20	Stakeholder meetings including leisure users and Yacht Club members
21	Aids to Navigation
22	North Berwick Harbour Trust Website – Management Rules
23	North Berwick Harbour Trust Website – North Berwick Harbour Navigation and Berthing Information.
24	Signage. Safety information and/or mandatory instructions: from the seaward approaches; low quay slipway; quayside; and beach front.
25	Harbour mouth exclusion zone - Management Rules
26	“No Swimming or diving” signs. Management Rules.
27	Qualification/Training for the Harbour Master
28	Installation of railings at specific locations of heightened risk.

3. Risk Hierarchy Table:

The level of risk hierarchy as detailed below for each vessel type is rated as Level 1 for highest risk and reducing as the Risk level number increases. The risk levels have been determined by taking the residual risk values and weighting the risk hierarchy on a sliding scale with the highest being risk to people, followed by property then environment and the lowest value on media.

RISK LEVEL	COMMERCIAL TRIP VESSEL	COMMERCIAL FISHING VESSEL	LEISURE VESSELS AND SMALL CRAFT
1	Fire Aboard	Fire Aboard	Fire Aboard
2	Collision with Fixed Object	Collision with Fixed Object	Collision with Fixed Object
3	Collision with Leisure Craft	Collision with Leisure Craft	Collision with Commercial Trip Vessel or Fishing Vessel
4	Collision with Commercial Trip Vessel or Fishing Vessel	Collision with Commercial Trip Vessel or Fishing Vessel	Collision with Leisure Craft
5	Swimming incident	Swimming incident	Swimming incident
6	Diving Incident	Diving Incident	Diving incident
7	Pollution/Bunker Spill	Pollution/Bunker Spill	Pollution/Bunker Spill
8	Breakout/Mooring Parted	Breakout/Mooring Parted	Breakout/Mooring Parted
9	Grounding	Grounding	Grounding

Marine Navigation Risk Assessment – Commercial Trip Vessel

Hazard	Description	Inherent Risk									Risk Mitigation	Residual Risk								Comments/Actions	
		Likelihood	Severity				Risk Rating					Likelihood	Severity				Risk Rating				
			People	Property	Environment	Media	People	Property	Environment	Media			People	Property	Environment	Media	People	Property	Environment		Media
Fire	Fire aboard.	3	5	5	2	4	15	15	6	12	1, 11, 12, 14, 15, 18, 22	2	5	5	2	4	10	10	4	8	Not possible to remove risk of fire from vessels totally. The consequences may be severe.
Collision With fixed object	With either side of Harbour entrance, Pier/Berths or vessels made fast alongside	3	4	4	2	3	12	12	6	9	1, 4, 5, 6, 12, 14, 15, 18, 19, 22, 23	2	2	2	1	1	4	4	2	2	Any collision likely to be low speed with minimal damage
Collision	With Leisure Vessel	3	5	5	1	3	15	15	3	9	1, 3, 4, 5, 6, 14, 15, 18, 19, 20, 22, 23, 24, 25,	2	3	2	1	2	6	4	2	4	Any collision likely to be low speed with minimal damage. Passengers with no seagoing experience may be at slightly higher risk than crew.
Collision	With another Commercial Trip Vessel or Commercial Fishing Vessel	3	5	5	2	4	15	15	6	12	1, 2, 4, 5, 6, 11, 12, 14, 15, 18, 19, 22, 23, 24, 25	2	3	2	1	2	6	4	2	4	Any collision likely to be low speed with minimal damage. Passengers with no seagoing experience may be at slightly higher risk than crew.

Swimming incident	Swimmers endangered by proximity of moving vessel	5	5	1	1	4	25	5	5	20	1, 4, 5, 6, 11, 14, 15, 18, 20, 22, 23, 24, 26, 27, 28	2	5	1	1	4	10	2	2	8	Swimmers are always likely in vicinity of the harbour despite efforts to dissuade them. Skippers must be extra vigilant and plan accordingly.
Diving incident	Divers endangered by proximity of moving vessel	3	5	1	1	4	15	3	3	12	1, 4, 5, 6, 11, 14, 15, 18, 20, 22, 23, 24, 26, 27	2	5	1	1	4	10	2	2	8	Divers also have their own risk assessments and should be more aware of the risks than casual swimmers.
Pollution	Hazardous Spill. Bunkering spill, spill of bunkers from collision.	3	1	2	2	3	3	6	6	9	12, 13, 14, 15, 19, 20, 22, 23, 27	2	1	2	2	2	2	4	4	4	
Breakout	Moorings parted, Berth Surge or Dragging Anchor	3	4	4	2	3	12	12	6	9	1, 7, 9, 12, 14, 15, 16, 19, 20, 23	2	4	4	2	2	8	8	4	4	
Accidental Grounding	In Port approaches, Harbour or Berths	3	1	3	1	2	3	9	3	6	1, 5, 6, 8, 9, 12, 14, 15, 16, 17, 18, 20, 21, 23	1	1	2	1	1	1	2	1	1	Skippers will be aware of risks at low tide and act accordingly.

Marine Navigation Risk Assessment – Commercial Fishing Vessel

Hazard	Description	Inherent Risk										Risk Mitigation	Residual Risk								Comments/Actions
		Likelihood	Severity				Risk Rating				Likelihood		Severity				Risk Rating				
			People	Property	Environment	Media	People	Property	Environment	Media			People	Property	Environment	Media	People	Property	Environment	Media	
Fire	Fire aboard.	3	5	5	2	4	15	15	6	12	2, 11, 12, 14, 15, 18, 22	2	5	5	2	4	10	10	4	8	Not possible to remove risk of fire from vessels totally. The consequences may be severe.
Collision	With fixed object side of Harbour entrance, Pier/Berths or vessels made fast alongside	3	4	4	2	3	12	12	6	9	2, 4, 5, 6, 12, 14, 15, 18, 19, 22, 23, 24	2	2	2	1	1	4	4	2	2	Any collision likely to be low speed with minimal damage
Collision	With Leisure Vessel	3	5	5	1	3	15	15	3	9	2, 3, 4, 5, 6, 14, 15, 18, 19, 20, 22, 23, 24, 25,	2	3	2	1	2	6	4	2	4	Any collision likely to be low speed with minimal damage Passengers with no seagoing experience may be at slightly higher risk than crew.
Collision	With Commercial Trip Vessel or another Commercial Fishing Vessel	3	5	5	2	4	15	15	6	12	1, 2, 4, 5, 6, 11, 12, 14, 15, 18, 19, 22, 23, 24, 25	2	3	2	1	2	6	4	2	4	Any collision likely to be low speed with minimal damage. Passengers with no seagoing experience may be at slightly higher risk than crew.

Swimming incident	Swimmers endangered by proximity of moving vessel	5	5	1	1	4	25	5	5	20	2, 4, 5, 6, 11, 14, 15, 18, 20, 22, 23, 24, 26, 27, 28	2	5	1	1	4	10	2	2	8	Swimmers are always likely in vicinity of the harbour despite efforts to dissuade them. Skippers must be extra vigilant and plan accordingly.
Diving incident	Divers endangered by proximity of moving vessel	3	5	1	1	4	15	3	3	12	2, 4, 5, 6, 11, 14, 15, 18, 20, 22, 23, 24, 26, 27	2	5	1	1	4	10	2	2	8	Divers also have their own risk assessments and should be more aware of the risks than casual swimmers.
Pollution	Hazardous Spill. Bunkering spill, spill of bunkers from collision.	3	1	2	2	3	3	6	6	9	12, 13, 14, 15, 19, 20, 22, 23, 27	2	1	2	2	2	2	4	4	4	
Breakout	Moorings parted, Berth Surge or Dragging Anchor	3	4	4	2	3	12	12	6	9	2, 7, 9, 12, 14, 15, 16, 19, 20, 23	2	4	4	2	2	8	8	4	4	
Accidental Grounding	In Port approaches, Harbour or Berths	3	1	3	1	2	3	9	3	6	2, 5, 6, 8, 9, 12, 14, 15, 16, 17, 18, 20, 21, 23	1	1	2	1	1	1	2	1	1	Skippers will be aware of risks at low tide and act accordingly.

Marine Navigation Risk Assessment – Leisure Vessel

Hazard	Description	Inherent Risk									Risk Mitigation	Residual Risk									Comments/Actions
		Likelihood	Severity				Risk Rating					Likelihood	Severity				Risk Rating				
			People	Property	Environment	Media	People	Property	Environment	Media			People	Property	Environment	Media	People	Property	Environment	Media	
Fire	Fire aboard.	3	5	5	2	4	15	15	6	12	1, 11, 12, 14, 15, 18, 22	2	5	5	2	4	10	10	4	8	Not possible to remove risk of fire from vessels totally. The consequences may be severe.
Collision With fixed object	With either side of Harbour entrance, Pier/Berths or vessels made fast alongside	3	4	4	2	3	12	12	6	9	1, 4, 5, 6, 12, 14, 15, 18, 19, 22, 23	2	2	2	1	1	4	4	2	2	Any collision likely to be low speed with minimal damage
Collision	With Leisure Vessel	3	5	5	1	3	15	15	3	9	1, 3, 4, 5, 6, 14, 15, 18, 19, 20, 22, 23, 24, 25,	2	3	2	1	2	6	4	2	4	Any collision likely to be low speed with minimal damage Passengers with no seagoing experience may be at slightly higher risk than crew.
Collision	With another Commercial Trip Vessel or Commercial Fishing Vessel	3	5	5	2	4	15	15	6	12	1, 2, 4, 5, 6, 11, 12, 14, 15, 18, 19, 22, 23, 25	2	3	2	1	2	6	4	2	4	Any collision likely to be low speed with minimal damage. Passengers with no seagoing experience may be at slightly higher risk than crew.

Swimming incident	Swimmers endangered by proximity of moving vessel	5	5	1	1	4	25	5	5	20	1, 4, 5, 6, 11, 14, 15, 18, 20, 22, 23, 24, 26, 27, 28	2	5	1	1	4	10	2	2	8	Swimmers are always likely in vicinity of the harbour despite efforts to dissuade them. Skippers must be extra vigilant and plan accordingly.	
Diving incident	Divers endangered by proximity of moving vessel	3	5	1	1	4	15	3	3	12	1, 4, 5, 6, 11, 14, 15, 18, 20, 22, 23, 24, 26, 27	2	5	1	1	4	10	2	2	8	Divers also have their own risk assessments and should be more aware of the risks than casual swimmers.	
Pollution	Hazardous Spill. Bunkering spill, spill of bunkers from collision.	3	1	2	2	3	3	6	6	9	12, 13, 14, 15, 19, 20, 22, 23, 27	2	1	2	2	2	2	4	4	4		
Breakout	Moorings parted, Berth Surge or Dragging Anchor	3	4	4	2	3	12	12	6	9	1, 7, 9, 12, 14, 15, 16, 19, 20, 23	2	4	4	2	2	8	8	4	4		
Accidental Grounding	In Port approaches, Harbour or Berths	3	1	3	1	2	3	9	3	6	1, 5, 6, 8, 9, 12, 14, 15, 16, 17, 18, 20, 21, 23	1	1	2	1	1	1	2	1	1	1	Skippers will be aware of risks at low tide and act accordingly.