

Ranked Hazard List

Rank No.	Hazard Ref	Affected Areas	Accident Category	Hazard Title	Hazard Detail	Affected Vessel Types	Affected Stakeholders	Possible Causes	Consequence Descriptions		Risk By Consequence Category								Risk Overall	Remarks
									Most Likely (ML)	Worst Credible (WC)	M L				W C					
											People	Property	Environment	Stakeholders	People	Property	Environment	Stakeholders		
1	4	Ballybunnion Buoy to Doonaha Buoy, Doonaha Buoy to North Carrig	Collision	LNG Carrier and large vessel in collision	LNG Carrier in collision at a navigation pinch point	LNG Carrier, All	Pilot, Shannon Foynes Port Company, Shannon LNG	Channel usage conflict No management of vessel traffic Attempted passing in channel Misjudgement or miscommunication by either/both vessels Low powered vessel has difficulty in clearing path of larger vessel committed to channel in heavy weather.	Minor contact/glancing blow with some minor structural damage	Severe damage to one or both vessels Pollution and / or loss of cargo containment on LNG carrier Possible fire Loss of life Sinking of one or both vessels Port or channel closure	4	7	0	7	6	6	6	6	5.86	
2	44	Ballybunnion Buoy to Doonaha Buoy	Grounding	Lead-In LNG Carrier Grounding - Channel	A Lead-In LNG Carrier leaves fairway and grounds between Tail of Beal and Beal Bar Buoys	LNG Carrier, All	Pilot, Pilot Launch, Shannon Foynes Port Company, Shannon LNG	Misjudgement by Master of manoeuvre in tidal stream/wind Lack of Local Knowledge Misinterpretation of/Ignoring External Advice/Orders Adverse weather / tidal conditions Loss of directional stability in heavy swell Lack of Bridge Team support (manning levels) and poor or No BRM principles being utilised Failure to monitor position in channel Poor passage planning and monitoring including over-reliance on channel buoys for position reference (poor visibility) Vessel not on leads on approach Miscalculation of UKC in heavy swell and state of tide Shore based Aids to Navigation inoperative or obscured in restricted visibility Inadequate aids to navigation Other craft obstructs manoeuvre on approach, or impedes assisting vessels Traffic conflict with vessels navigating near limits of fairway Lack of vessel traffic management Lack of formal vessel traffic management	Glancing grounding at margins of the deep water channel Damage to hull plating	Vessel grounds with moderate damage to double bottom plating and propeller/rudder Delay until Refloated, main channel closed to large movements	2	6	0	7	4	7	0	7	5.61	
3	36	Port Approaches up to Ballybunnion Buoy	Grounding	LNG Carrier grounds in the port approach	LNG Carrier grounds in the port approach prior to boarding pilot	LNG Carrier, All	Shannon Foynes Port Company, Shannon LNG	Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions Vessel subjected to excessive leeway and/or current and unable to maintain track Late pilot boarding - e.g. difficulties in boarding (weather, access arrangements, etc) Vessel stands in too close prior to pilot boarding Lack of support from Bridge Team (manning levels) Poor or No BRM principles being utilised Poor/Inadequate Passage Planning Poor passage planning and monitoring including over-reliance on channel buoys for position reference (poor visibility) Failure to monitor position Inadequate Master/pilot information exchange Inadequate aids to navigation Miscalculation of UKC in heavy swell and state of tide Other craft obstructs manoeuvre on approach, or impedes assisting vessel Movement attempted in restricted visibility/night, lack of visual cues (disorientation) Propulsion/steering or bow thrust failure at critical stage Inadequate aids to navigation Inexperience or Master not trained in emergency response aboard vessel No risk assessment prior to movement Lack of vessel traffic management	Refloated with minor damage to external hull Refloated by attending tugs	Major port emergency declared Partial flooding and increase in draught Major damage to vessel Stranding Theoretical escape of cargo through tank displacement Port closure during salvage operations	2	6	0	6	4	7	0	7	5.27	
4	42	Doonaha Buoy to North Carrig	Grounding	LNG Carrier grounding - Channel	LNG Carrier leaves channel between Doonaha Buoy and North Carrig and grounds	LNG Carrier, All	Pilot, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Adverse weather / tidal conditions Movement attempted in restricted visibility, lack of visual cues Poor assessment of set and leeway; Other craft obstructs manoeuvre on approach, or impedes assisting vessels Inadequate aids to navigation Propulsion/steering/control systems or bow thrust failure at critical stage Miscalculation of UKC in respects to stage of tide and conditions Poor passage planning and monitoring including over-reliance on channel buoys for position reference (poor visibility) Traffic conflict with other large movement Lack of vessel traffic management Tug operational failure or miscommunications between ship handler/pilot & Tugmaster	Prompt refloating Minor damage to vessel Hull not breached Delays during investigation/surveys	Vessel grounds with moderate damage to double bottom plating and propeller/rudder Delay until Refloated, main channel closed to large movements	2	6	0	6	4	7	0	7	5.27	
5	40	Ballybunnion Buoy to Doonaha Buoy	Grounding	LNG Carrier Grounding - Entrance	LNG Carrier leaves fairway and grounds between Tail of Beal and Beal Bar Buoys	LNG Carrier, All	Pilot, Shannon Foynes Port Company, Shannon LNG	Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions Loss of directional stability in heavy swell Lack of Bridge Team support (manning levels) and poor or No BRM principles being utilised Failure to monitor position in channel Poor passage planning and monitoring including over-reliance on channel buoys for position reference (poor visibility) Vessel not on leads on approach Miscalculation of UKC in heavy swell and state of tide Shore based Aids to Navigation inoperative or obscured in restricted visibility Inadequate aids to navigation Other craft obstructs manoeuvre on approach, or impedes assisting vessels Traffic conflict with vessels navigating near limits of fairway Lack of vessel traffic management Tug operational failure or miscommunications between ship handler/pilot & Tugmaster	Glancing grounding at margins of the deep water channel Damage to hull plating	Vessel grounds with moderate damage to double bottom plating and propeller/rudder Delay until Refloated, main channel closed to large movements	2	6	0	6	4	7	0	7	5.27	

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6	29	North Carrig to Tarbert inc LNG jetty	Fire/Explosion	LNG Carrier Fire	Fire on LNG Carrier whilst alongside	LNG Carrier, All	Shannon Foynes Port Company, Shannon LNG	Accommodation and machinery space fires Gas leak from cargo pipes, glands, safety valve ignited by any source Accommodation and machinery space fires Other vessel or small leisure craft that is disabled and on fire and drifts down onto terminal	Fire brought under control and extinguished by ships staff, possibly with assistance from shore fire and rescue service Major port emergency declared Shutdown of LNG Terminal and activation of Emergency Plans	Fire on LNG carrier not immediately contained or extinguished Failure of jetty fire fighting equipment Delay in arrival of Fire Service appliances Tug unable to assist fire fighting Possible multiple fatalities Reduction in port trade	4	4	0	2	7	7	2	7	5.03	Major port emergency declared
7	31	Port Approaches up to Ballybunnion Buoy, Ballybunnion Buoy to Doonaha Buoy, Doonaha Buoy to North Carrig, North Carrig to Tarbert inc LNG jetty	Fire/Explosion	Fire on LNG Carrier whilst underway	Fire on LNG Carrier while underway in harbour areas	LNG Carrier, All	Pilot, Shannon Foynes Port Company, Shannon LNG	Accommodation or machinery space fires or electrical failure Gas leak from cargo pipes, glands, safety valve ignited by any source	Fire brought under control and extinguished by ships staff, possibly with assistance from tugs	Fire on LNG carrier not immediately contained or extinguished Tug fire fighting ability slow to deploy Possible multiple fatalities	4	4	0	2	7	7	2	7	5.03	Unlikely to have major gas leak without detection during transit Major port emergency declared Possible increased likelihood of hazard over sea passage due to preparations for commencement of discharge during which errors could be made in operation of
8	3	Port Approaches up to Ballybunnion Buoy	Collision	LNG Carrier in collision in port approach	LNG Carrier in collision with another vessel in port approaches	LNG Carrier, All	Shannon Foynes Port Company, Shannon LNG	Misjudgement by either vessel Coastal traffic bound passed the Shannon Estuary conflicting offshore Bridge team focussed manoeuvring to embark pilot Difficulty in boarding pilot (weather conditions, ship rolling, access arrangements, etc) Port traffic conflicting in final approach area - e.g. outbound vessel impedes manoeuvre	Minor contact/glancing blow with some minor structural damage	Severe damage to one or both vessels Pollution and / or loss of cargo containment on LNG carrier Possible fire Loss of life Sinking of one or both vessels	3	6	0	6	5	5	5	5	4.98	
9	12	Port Approaches up to Ballybunnion Buoy, Ballybunnion Buoy to Doonaha Buoy	Collision	Dolphin Watch collides with LNG Carrier in Port Approaches	Dolphin Watch collides with LNG Carrier in Port Approaches	Passenger, LNG Carrier	Dolphin Watch, Shannon Foynes Port Company, Shannon LNG	Dolphin Watch obstructs LNG Carrier due to lack of knowledge of Bye-Laws Misjudgement of closest point of approach, lack of appreciation of manoeuvring characteristics or blind sector under and ahead of bow of vessel Dolphin Watch appears without warning ilure (reliquification plant)	Minor contact/glancing blow Possible injuries/man overboard on Dolphin Watch from wash of larger vessel Secondary hazard: Larger vessel's margin of safety reduced when taking avoiding actions in entrance channel	Dolphin Watch run down by LNG Carrier. Vessel lost. Possible multiple fatalities.	5	2	0	5	6	6	5	6	4.83	Dolphin Watch generally keep out of main channels used by commercial shipping and are aware of all shipping operations
10	6	Port Approaches up to Ballybunnion Buoy, Ballybunnion Buoy to Doonaha Buoy, Doonaha Buoy to North Carrig, North Carrig to Tarbert inc LNG jetty	Collision	Cruise ship and LNG Carrier in collision	Cruise vessel in collision with LNG Carrier	LNG Carrier, Passenger	Pilot, Shannon Foynes Port Company, Shannon LNG	Misjudgement of Bridge Team on either vessel Conflicting traffic movement including congestion at Pilot Boarding Area Lack of traffic management (e.g. allowing vessel to be underway at same time)	Minor contact/glancing blow with some minor structural damage	Moderate or major damage to one or both vessels Potential for fire/explosion Potential for fatalities Possible loss of one or both vessels	4	5	0	5	5	5	5	5	4.71	
11	10	North Carrig to Tarbert inc LNG jetty	Collision	LNG Carrier damaged by contact with tug	LNG Carrier damaged by contact with tug	LNG Carrier, Port Service Craft	Pilot, Shannon LNG, Tugs and Towing Company	Misjudgement by tugmaster Mechanical failure on board tug	Minor damage to vessel.	Shell plating damaged with possible water ingress to ballast / void spaces. Progressive (slow) increase of draught / list	2	6	0	2	2	6	0	6	4.49	VTS controls
12	2	Port Approaches up to Ballybunnion Buoy	Collision	Leisure craft collision with LNG Carrier	Leisure craft collides with LNG Carrier in Port Approaches	Leisure, LNG Carrier	Leisure Users, Shannon Foynes Port Company, Shannon LNG	Leisure craft obstructs LNG Carrier due to lack of knowledge of Bye-Laws Misjudgement of closest point of approach, lack of appreciation of manoeuvring characteristics or blind sector under and ahead of bow of vessel Sailing craft becalmed or capsized in path of larger vessel Leisure craft appears without warning at speed from radar shadow area Consumption of alcohol impairs judgement of leisure craft operator	Minor contact/glancing blow Possible injuries/man overboard on leisure craft from wash of larger vessel Secondary hazard: Larger vessel's margin of safety reduced when taking avoiding actions in entrance channel	Leisure craft run down by large vessel Possible multiple fatalities	5	2	0	3	6	5	2	5	4.42	Leisure craft generally keep out of main channels used by commercial shipping
13	41	Ballybunnion Buoy to Doonaha Buoy	Grounding	LNG Carrier Grounding - During turn	Vessel misjudges turn in vicinity of Beal Bar/ Doonaha Buoy	LNG Carrier, All	Pilot, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions Lack of support from Bridge Team or poor or No BRM principles being utilised Failure to monitor position in channel Poor assessment of set and leeway; Poor passage planning and monitoring including over-reliance on channel buoys for position reference (poor visibility) Complacency of bridge team once Pilot embarked Inadequate Master/pilot information exchange Other craft obstructs manoeuvre on approach, or impedes assisting vessels Inadequate aids to navigation Relatively tight bend / narrow channel Failure of Buoy lights at night Traffic conflict results in vessel turning late Lack of vessel traffic management Tug operational failure or miscommunications between ship handler/pilot & Tugmaster during turn	Glancing grounding at margins of the deep water channel Minor damage to hull plating	Vessel grounds with moderate damage to double bottom plating and propeller/rudder Delay until Refloated, main channel closed to large movements	2	5	0	5	3	6	0	6	4.38	At 12.5 metres draft, there is sufficient water to pass to the north of Doonaha Buoy

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14	28	Ballybunnion Buoy to Doonaha Buoy	Contact - Navigation	Lead-In LNG Carrier in contact with Aid to Navigation	A Lead-In LNG Carrier in contacts channel mark	LNG Carrier, All	Pilot, Pilot Launch, Shannon Foynes Port Company, Shannon LNG	Misjudgement by Master of manoeuvre in tidal stream/wind Lack of Local Knowledge Misinterpretation of/Ignoring External Advice/Orders Adverse weather / tidal conditions Movement attempted in restricted visibility, lack of visual cues Propulsion/steering or bow thrust failure at critical stage Transit impeded by another vessel at critical time Poor or No BRM principles being utilised Failure to monitor position in channel Escort Tug unable to assist in time Lack of formal vessel traffic management	Minor contact with buoy with superficial damage, scraped paintwork.	Navigation mark put out of commission by heavy contact Possible steering gear damage	0	4	0	6	0	6	0	6	4.35	
15	14	North Carrig to Tarbert inc LNG jetty	Contact - Navigation	Other Vessel Contacts LNG Terminal jetty	Other vessel comes into contact with unoccupied LNG Terminal jetty	All, All	Pilot, Shannon Foynes Port Company, Shannon LNG	Passing vessel using eddies Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions. Propulsion or steering failure at critical stage	Glancing blow with superficial damage to berth	Vessel contacts berth with penetration of shell plating Possible loss of cargo (single hull) or fuel oil / pollution Damage to LNG jetty / dolphins LNG jetty out of commission until repaired	2	4	0	2	3	6	3	5	4.28	
16	27	Doonaha Buoy to North Carrig	Contact - Navigation	LNG Carrier in contact with vessel at anchor	LNG Carrier contacts vessel at anchor	LNG Carrier, All	Pilot, Shannon Foynes Port Company, Shannon LNG	Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions Movement attempted in restricted visibility, lack of visual cues Propulsion/steering or bow thrust failure at critical stage Anchored vessel in incorrect position or drags anchor into channel Poor or No BRM principles being utilised Failure to monitor position in channel Escort Tug unable to assist in time	Glancing blow with minor damage to both vessels.	Major damage to both vessels.	0	5	0	5	3	6	0	6	4.26	
17	16	North Carrig to Tarbert inc LNG jetty	Contact - Navigation	Berthed LNG Carrier contacted by passing vessel	Berthed LNG Carrier contacted by passing vessel	All, All	Pilot, Shannon Foynes Port Company, Shannon LNG	Propulsion/steering or bow thrust failure at critical stage on passing vessel Misjudgement of manoeuvre in tidal stream/wind on other vessel Adverse weather / tidal conditions Transit impeded by another vessel at critical time Vessels passing too close (Interaction) Poor or No bridge team management principles being utilised Failure to monitor position in channel	Glancing blow Damage to plating on both vessels No loss of cargo containment	Penetration of LNG hull resulting flooding and consequent loss of power.	2	5	0	2	4	5	4	5	4.17	Proposed jetty is clear of main channel Proposed to have a standby tug in vicinity Pilot on board commerical passing vessels Vessels have space to anchor in the event of a systems failure Pilots only use 'eddies when no vessel is alongside Tarbet; this would apply to LNG
18	53	Ballybunnion Buoy to Doonaha Buoy, North Carrig to Tarbert inc LNG jetty	Personal Injury	Personal injury to tug crew	Personal injury to tug crew during towage and/or connecting up	Port Service Craft, All	Shannon Foynes Port Company, Tugs and Towing Company	Heavy weather resulting in violent motion Shipping water on deck Towline parts Error or inexperience of crew handling winch or towline Contact with weighted heaving lines passed between tug and ship Incorrect PPE Inexperience of Tugmaster in conditions Crew unbalanced from heavy landing on vessel Having to connect up under expediency Towing equipment not fit for purpose	Minor injury resulting from fall or slip on tug; Minor injury to hands or fingers while connecting ropes;	Tug crew fatality from parting towline Tug crew washed from deck in heavy weather outside entrance	4	2	0	2	6	4	0	4	4.09	Likelihood of hazard may be higher if untrained personnel are used to relieve normal crew;
19	20	North Carrig to Tarbert inc LNG jetty	Contact - Navigation	Large vessel swinging onto Money Point contacts jetty or LNG Carrier	Large vessel such as a Capesize BC contacts jetty or vessel berthed alongside whilst swinging off Money Point	Bulk Carrier, All	ESB, Pilot, Shannon Foynes Port Company, Shannon LNG	Catastrophic failure of propulsion/steering and tug control at critical stage Excessive speed on commencing swing Adverse weather eg squally wind from North or wind speed increases after vessel committed to manoeuvre Not monitoring weather forecasts/warnings Movement attempted in restricted visibility, lack of visual cues Other craft obstructs manoeuvre on approach, or impedes assisting vessels	Contact damage to both vessels (or vessel and berth) Delay to berthing and during investigation and survey	Major damage to both vessels or vessel/jetty Possible pollution from bulk carrier Potential for loss of life Damage to Jetty Mooring breakout on LNG Carrier.	0	4	0	4	5	5	5	5	4.07	Money Point is on the north bank and to the east of the proposed LNG jetty There is plenty of sea room for berthing and swinging vessels bound to or from Money Point
20	22	North Carrig to Tarbert inc LNG jetty	Contact - Navigation	LNG carrier contacts jetty / vessel during transit/swing	LNG Carrier comes into contact with berth or another vessel alongside during transit and swing	LNG Carrier, All	Pilot, Shannon Foynes Port Company, Shannon LNG	Vessels passing too close / interaction Misjudgment Strong cross winds causing leeway / requiring set especially in squally conditions Reduction of speed may be required if vessels alongside jetties Steering failure. Power failure. Vessel unable to get all tugs fast.	Glancing blow - minor or moderate damage to one or both vessels Damage to moorings Pollution (from damage to cargo connections Damage to gangways	Glancing blow - moderate or major damage to one or both vessels Mooring breakout Pollution (from damage to cargo connections Damage to gangways	1	4	3	3	3	5	4	5	4.07	
21	7	Ballybunnion Buoy to Doonaha Buoy	Collision	Escort tug and LNG Carrier collision	Escort tug in collision with LNG Carrier during ship escort / connection	Port Service Craft, LNG Carrier	Pilot, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Misjudgement during connecting for active escort in adverse weather Poor communication between tug and ship's crew Control systems failure on tug or misjudgement Sudden illness/incapacitation of Tugmaster with no trained person immediately available to take controls	Glancing blow with minor damage to tug bulwarks and fendering Possibility for minor injuries to tug crew on deck (unable to keep balance and falls to deck or against winch)	Tug goes under counter of LNG Carrier Major damage to tug Possible puncture of after peak plating of LNG Carrier Potential for fatality on tug	4	4	0	0	5	6	0	3	4.04	Escort tugs normally have a significant wave height restriction for safe connecting up Tug masters are well trained & experienced
22	35	Port Approaches up to Ballybunnion Buoy, Ballybunnion Buoy to Doonaha Buoy	Foundering	Pilot launch swamped/capsized	Pilot launch floods in adverse weather/sea conditions during LNGC pilot operations	Port Service Craft, All	Pilot, Pilot Launch, Shannon Foynes Port Company	Adverse operating conditions. Deck openings not secured. Wheelhouse window broken by heavy seas. Propulsive or steering system failure, inability to maintain safe heading in seaway. Damage to vessel during transfer operations. Inadequate lee made by vessel.	Water ingress controlled by bilge pumps, launch returns to sheltered waters with minor water logging to lower spaces or wheelhouse.	Water ingress through structural failure in heavy weather with loss of pilot launch and possibility of fatalities.	0	2	0	5	5	5	3	4	3.97	Engine reliability questionable. Use of Foynes pilot cutter (Kerry Head) at Killrush if transfer inside heads

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23	8	North Carrig to Tarbert inc LNG jetty	Collision	Tug and LNG Carrier collision	Tug in collision with LNG Carrier during manoeuvring and/or connecting up operations	Port Service Craft, LNG Carrier	Pilot, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Attempting connection at relatively high speed for tug Misjudged approach by tug Loss of tug control systems, engine power or engine/s at critical stage Pilot or Master not monitoring tug position, moves ahead or astern when tug not clear Tug use plan not provided or discussed Loss of communications Winch does not release under emergency conditions Tugmaster temporarily incapacitated and control lost before another crew member can take over Poor forward visibility on LNG carrier.	Tug has glancing blow with hull and pushed off before regaining control with nil or minimal damage	Tug over-run or caught under bow flare doing considerable damage to mast and wheelhouse structure Injuries to tug crew Tug holed and disabled Possibility of tug sinking; Fatalities; Salvage operations;	3	0	0	0	6	6	5	5	3.92	Connecting speed is generally 4 knots or less and procedure is for tugs to avoid crossing ahead of ships proceeding at more than 5 knots Tug pushing outside the designated area of the shipside
24	37	North Carrig to Tarbert inc LNG jetty	Grounding	LNG Carrier grounds near berth	LNG Carrier grounds near berth during swinging manoeuvre	LNG Carrier, All	Pilot, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Initial lack of familiarity with LNG vessel type - handling characteristics Misjudgement of manoeuvre in tidal stream/wind allowing vessel to travel outside manoeuvring area Adverse weather / tidal conditions Movement attempted in restricted visibility/night, lack of (or obscured) visual cues. Miscalculation of UKC Poor assessment of set and leeway; Poor passage planning and monitoring including over-reliance on channel buoys for position reference (poor visibility) Excessive headway on commencement of turn Tug operational failure or miscommunications between ship handler/pilot & Tugmaster Incorrect tug usage and power for manoeuvre Other craft obstructs manoeuvre on approach, or impedes assisting vessels Poor or No BRM principles being utilised Failure to monitor position in channel Pilot judgement impaired due to fatigue	Low energy grounding Refloated promptly Minor damage to shell plating Possible damage to rudder / propeller	Vessel grounds with force Unable to refloat on remainder of flood Possible vapour release in the event of prolonged stranding Port closure during refloating operations	0	5	0	5	3	5	0	5	3.91	Pilots have a portable berthing coputer aid that bis independant of the ships systems.
25	30	North Carrig to Tarbert inc LNG jetty	Fire/Explosion	Fire on Service Craft	Fire on Service Craft in attendance at LNG terminal	Port Service Craft, All	Mooring Crews and Boats, Pilot Launch, Shannon Foynes Port Company, Tugs and Towing Company	Poor maintenance Mechanical or electrical fault Inadequate training of crew or maintenance staff	Source of ignition detected early with fire quickly extinguished with minimal damage	Engine room or electrical fire causes major damage Possible loss of craft Possible fatality Reduction in port facilities Secondary hazard: Fire threatens LNG Carrier	4	0	0	2	5	5	3	5	3.88	Assistance can be given by other craft/LNG Carrier Harbour Emergency Plans Harbour maintenance procedures Crew training
26	15	North Carrig to Tarbert inc LNG jetty	Collision	LNGC in contact with Ferry	LNG Carrier unable to manoeuvre onto berth and drifts down onto ferry	LNG Carrier, Passenger	Pilot, Shannon Ferries, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions Control system failures on LNGC and/or tugs	Superficial damage to LNGC and/or ferry plating/paintwork	Heavy impact with possibility of some passengers being injured and damage to vehicles. Punctured shell plating above waterline requiring repair and inspection before ferry resumes sailing Negative publicity	3	3	0	4	4	5	0	5	3.8	Ferry route runs across the Shannon Estuary and is 2 miles east of proposed LNG Terminal; therefore the LNGC would not normally come within proximity of the ferry under exceptional circumstances
27	13	North Carrig to Tarbert inc LNG jetty	Contact - Berthing	Contact Berthing LNG Carrier	LNG Carrier contacts berth heavily	LNG Carrier, All	Pilot, Shannon Foynes Port Company, Shannon LNG	Wind limits for berthing exceeded Misjudgement of manoeuvre in tidal stream/wind or adverse weather / tidal conditions Movement attempted in restricted visibility, lack of visual cues Tug operational failure or miscommunications between ship handler/pilot & Tugmaster Ship handler not used to manoeuvring vessel (lacks currency) with tug assistance Other craft obstructs manoeuvre on approach, or impedes assisting vessels Propulsion/steering or bow thrust failure at critical stage Approach/departure not planned sufficiently for conditions Fatigue impairs judgement of master or pilot Initial lack of familiarity with LNG vessel type as trade starts (handling characteristics)	Heavier landing than anticipated with minor damage to berth facing and plating of vessel	LNG Carrier set down onto jetty or dolphins Damage to fender system Damage to vessel and possible penetration of hull	2	4	0	2	2	5	2	5	3.74	Pilots may be using a carry aboard system for position fixing independent of the ships navigation system Approach speed is likely to be low, due to pilot caution Area subject to changeable weather Beam wind forces can be considerable.
28	39	Port Approaches up to Ballybunnon Buoy	Grounding	LNG Carrier grounds during transit of Bar	LNG Carrier grounds during transit of Ballybunnon Bar inward or outward	LNG Carrier, All	Pilot, Shannon Foynes Port Company, Shannon LNG	Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions Loss of directional stability in heavy swell Poor assessment of set and leeway; Poor passage planning and monitoring including over-reliance on channel buoys for position reference (poor visibility) Lack of support from Bridge Team or poor or No BRM principles being utilised Failure to monitor position Miscalculation of UKC in respects to state of tide and weather conditions Traffic conflict resulting in LNGC being impeded and taking avoiding action into shallow water Lack of vessel traffic management Tug operational failure or miscommunications between ship handler/pilot & Tugmaster	Damage to shell plating Prompt refloating Possible slight berthing delay Possible delays to other vessels during stabilisation of situation	Major hull damage Restriction of port operations Possible loss of cargo if machinery disabled or vessel stranded	1	4	0	4	3	5	0	5	3.71	Arrival draft expected to be about 12.5 metres and depth over Bar is 16.4 metres

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29	50	North Carrig to Tarbert inc LNG jetty	Personal Injury	Personal Injury to Line Boat Crew	Line boat crew suffer personal injury during berthing operations	Port Service Craft, All	Mooring Crews and Boats, Pilot, Shannon Foynes Port Company, Shannon LNG	Poor communications between Pilot / tugs / line boat Line boat operating in rough conditions Propulsion/steering/control systems failure at critical stage Crossing springs (line boat passing over the top of) Line boat caught between berth face and ship Anchor dropped while line boat underneath Uncontrolled dropping of mooring lines or wires onto Line Boat Line boat underpowered for lines being passed Lack of training and/or procedures	Minor injury to line boat crew through trip/slip/fall	Possible fatality Damage to boat Delay to vessels if no line boat available	6	0	0	0	5	2	0	3	3.7	
30	55	North Carrig to Tarbert inc LNG jetty	Personal Injury	Mooring gang injured whilst working on dolphins	Mooring gang sustain injuries during mooring (or unmooring) operations on dolphins	Port Service Craft, All	Mooring Crews and Boats, Shannon LNG	Restricted working room Poor design layout Communication (Language) problems between ship and mooring gangs Lineboat radios cannot be heard over the noise of the engines Lack of/or inadequate training	Minor injury. Person falls into water or mooring boat	Fatality	4	0	0	0	6	2	0	4	3.67	
31	54	Ballybunnion Buoy to Doonaha Buoy, North Carrig to Tarbert inc LNG jetty	Personal Injury	Personal injury to LNG carrier crew	Personal injury to LNG carrier crew during towage and/or connecting up	LNG Carrier, All	Shannon Foynes Port Company, Shannon LNG	Heavy weather resulting LNG carrier motion; Towline parts; Untrained crew handling winch or towline; Incorrect personal protective equipment; Experience of tugmaster in conditions; LNG carrier 's crew unbalanced from heavy landing on vessel; Having to connect up under expediency; Towing points not fit for purpose	Minor injury resulting from fall or slip on LNG carrier; Minor injury to hands or fingers while connecting ropes;	Serious injury to a crew member; possible fatality	4	0	0	0	6	2	0	4	3.67	Risk level may be higher if crew needs to make tug fast with expediency;
32	23	North Carrig to Tarbert inc LNG jetty	Contact - Navigation	Dolphin Watch in contact with structure	Dolphin Watch involved in contact with LNG jetty	Passenger, All	Dolphin Watch, Shannon Foynes Port Company, Shannon LNG	Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions Disoriented by night or in restricted visibility FV proceeding at excessive speed Propulsion/steering failure at critical stage. Lack of knowledge or experience Judgement impaired due to alcohol/fatigue Absence of vessel traffic management	Dolphin Watch is set down onto LNG jetty with no significant damage to either vessel or berth	Dolphin Watch contacts jetty with possible damage causing water ingress and sinking Possibility of fatalities on dolphinwatch	2	2	0	2	6	5	2	5	3.63	
33	26	North Carrig to Tarbert inc LNG jetty	Contact - Navigation	Dolphin Watch involved in contact with LNG carrier alongside	Dolphin Watch involved in contact with LNG carrier alongside	Passenger, All	Dolphin Watch, Shannon Foynes Port Company, Shannon LNG	Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions Disoriented by night or in restricted visibility FV proceeding at excessive speed Propulsion/steering failure at critical stage. Lack of knowledge or experience Judgement impaired due to alcohol/fatigue Absence of vessel traffic management	Dolphin Watch is set down onto LNG carrier with no significant damage to either vessel or berth	Dolphin Watch contacts carrier with possible damage causing water ingress and sinking Possibility of fatalities on dolphinwatch	2	2	0	2	6	5	2	5	3.63	
34	19	Ballybunnion Buoy to Doonaha Buoy, Doonaha Buoy to North Carrig	Contact - Navigation	LNG Carrier in contact with Aid to Navigation	LNG Carrier in contact with channel mark	LNG Carrier, All	Commissioner of Irish Lights, Pilot, Shannon Foynes Port Company, Shannon LNG	Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions Movement attempted in restricted visibility, lack of visual cues Propulsion/steering or bow thrust failure at critical stage Transit impeded by another vessel at critical time Poor or No BRM principles being utilised Failure to monitor position in channel Escort Tug unable to assist in time	Minor contact with buoy with superficial damage, scraped paintwork.	Navigation mark put out of commission by heavy contact Possible steering gear damage	0	4	0	0	0	6	0	6	3.61	
35	11	North Carrig to Tarbert inc LNG jetty	Collision	Fishing vessel run down by LNG Carrier	Fishing vessel in collision with LNG Carrier whilst retrieving pots	Fishing Craft, LNG Carrier	Commercial Anglers, Pilot, Shannon LNG, Tugs and Towing Company	Fishing vessel obstructs LNG Carrier whilst retrieving pots Misjudgement of closest point of approach, lack of appreciation of manoeuvring characteristics or blind sector under and ahead of bow of vessel Fishing vessel unaware of impending LNG movement Fishing Vessel not keeping a proper lookout or VHF watch Fishing vessel becomes hampered by its gear and unable to move in time	Minor contact/glancing blow Possible injuries/man overboard from wash of larger vessel Loss of gear Secondary hazard: Larger vessel's margin of safety reduced when taking avoiding actions.	Fishing vessel run down by the LNG Carrier and sinks. Possible multiple fatalities	3	2	0	3	5	3	2	5	3.58	Fishing vessels lay pots within the channel/estuary particularly in winter
36	45	Port Approaches up to Ballybunnion Buoy, Ballybunnion Buoy to Doonaha Buoy, Doonaha Buoy to North Carrig, North Carrig to Tarbert inc LNG jetty	Port Security Incident	Terrorist Incident	Terrorist Incidents can impinge on all activities and operations in the port. They are likely to be unspecified but may have prior warning. It must be assumed that every activity is a hazard and produces maximum risks.	All, All	ESB, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Terrorist attacks could come from the open sea, the air, from the local water access points in the area or from land by road transport. Port security level increased from information received by external official sources	Such an incident would be controlled under the ISPS Code. Possible non-event - politically motivated protest. Delays from increased security levels.	An unexpected attack could cause serious damage to vessels and port facilities resulting in groundings, sinkings, fire or explosions.	0	0	0	3	5	5	4	5	3.57	
37	33	Ballybunnion Buoy to Doonaha Buoy, North Carrig to Tarbert inc LNG jetty	Foundering	Capsize of tug	Tug floods or is capsized during ship assist	Port Service Craft, All	Pilot, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Tug not fit for purpose Tug-master not trained in towing off the hook Hook fails to release when required, poor maintenance or incorrectly set Misunderstood communications between pilot/ship handler and tug-master Watertight hatches not secured on tug Ship moves ahead unexpectedly while tug connected Inadequate briefing between pilot or ship handler and tug-master	Tug heels and towed sideways but quick release successfully releases towline	Towline fails to release and downflooding occurs quickly through unsecured deck openings when tug takes heel Tug capsizes with loss of life Reduced port facility due to loss of tug	0	2	0	0	6	6	5	6	3.47	
38	32	Port Approaches up to Ballybunnion Buoy	Foundering	Flooding of escort or berthing tug	Escort tug floods whilst assisting LNG Carrier	Port Service Craft, All	Pilot, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Tug W/T doors not secured during operation Downflooding if tugs heels during connected operation Inattention by tug crew Inappropriate procedures	Deck openings secured, only partial water ingress results from heel	Progressive downflooding leads to loss of stability and capsize of escort tug during active escort Possible fatalities Reduction in port facilities	0	2	0	0	6	6	5	6	3.47	

Ranked Hazard List



Rank No.	Hazard Ref	Affected Areas	Accident Category	Hazard Title	Hazard Detail	Affected Vessel Types	Affected Stakeholders	Possible Causes	Consequence Descriptions		Risk By Consequence Category				Risk Overall	Remarks				
									Most Likely (ML)	Worst Credible (WC)	M L		W C							
											People	Property	Environment	Stakeholders			People	Property	Environment	Stakeholders
39	18	North Carrig to Tarbert inc LNG jetty	Contact - Navigation	Commercial Angler in contact with structure	Commerical angling craft involved in contact with LNG Carrier jetty	Fishing Craft, All	Commercial Anglers, Shannon Foynes Port Company, Shannon LNG	Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions Disoriented by night or in restricted visibility FV proceeding at excessive speed Propulsion/steering failure at critical stage. Lack of knowledge or experience Judgement impaired due to alcohol/fatigue Absence of vessel traffic management	FV is set down onto berthed LNG Carrier with no significant damage to either fishing vessel or berth	FV contacts carrier with possible damage causing water ingress and sinking Possibility of fatalities of vessel crew	0	2	0	2	5	5	2	5	3.15	Proposed jetty is well clear of main channels
40	25	North Carrig to Tarbert inc LNG jetty	Contact - Navigation	Commercial Angling Craft in contact LNG Carrier Alongside	Commerical angling craft involved in contact with LNG Carrier	Fishing Craft, All	Commercial Anglers, Shannon Foynes Port Company, Shannon LNG	Misjudgement of manoeuvre in tidal stream/wind Adverse weather / tidal conditions Disoriented by night or in restricted visibility FV proceeding at excessive speed Propulsion/steering failure at critical stage. Lack of knowledge or experience Judgement impaired due to alcohol/fatigue Absence of vessel traffic management	Commerical Angler is set down onto berthed LNG Carrier with no significant damage to either fishing vessel or berth	Commercial Angler contacts carrier with possible damage causing water ingress and sinking Possibility of fatalities of vessel crew	0	2	0	2	5	5	2	5	3.15	
41	9	North Carrig to Tarbert inc LNG jetty	Collision	Leisure craft collision with swinging vessel	Leisure craft obstructs vessel manoeuvring on/off berth or swinging in the fairway or manoeuvring in an anchorage.	Leisure, LNG Carrier	Leisure Users, Pilot, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Lack of marine knowledge of leisure craft operator Inattention and poor look out Sound signals not used by larger vessel to warn of impending movement Failure of engine on craft or being becalmed on yacht	Larger vessel modifies intended manoeuvre Glancing blow only with minor damage to small vessel	Leisure craft collides with swinging vessel or tug assisting Major damage to craft with potential for fatalities	2	2	0	2	5	3	2	3	3.13	Leisure craft generally keep out of main channels used by commercial shipping
42	5	Port Approaches up to Ballybunnion Buoy, Ballybunnion Buoy to Doonaha Buoy, Doonaha Buoy to North Carrig, North Carrig to Tarbert inc LNG jetty	Collision	Pilot Launch/harbour craft in collision with LNG Carrier	Pilot launch or harbour craft in collision with LNG Carrier	Port Service Craft, LNG Carrier	Mooring Crews and Boats, Pilot, Pilot Launch, Shannon LNG	Human error or misjudgement of manoeuvre Poor lookout Lights difficult to detect against shore lighting, or backscatter from harbour crafts own lights (e.g. deck lights on tug)	Glancing blow between pilot launch or craft and LNG Carrier with minor damage to craft	Possibility of some crew being thrown into water with potential for drowning Potential for loss of craft	2	2	0	0	5	5	2	5	2.93	Harbour craft does not include tugs which is another hazard
43	24	North Carrig to Tarbert inc LNG jetty	Contact - Navigation	Leisure Craft in contact with LNG Carrier alongside	Leisure craft involved in contact with LNGCarrier alongside	Leisure, All	Leisure Users, Shannon Foynes Port Company, Shannon LNG	Disoriented by night or in restricted visibility Lack of knowledge or experience Judgement impaired due to alcohol/fatigue Excessive speed in close proximity LNG Terminal Disregard of Bye-Laws Misjudgement of clearance under berth	Sailing craft contacts carrier at relatively slow speed Damage to boat or rigging but no damage to jetty structure	Leisure craft sinks in vicinity and possible crew and passenger fatalities	0	2	0	0	5	5	2	3	2.91	
44	17	North Carrig to Tarbert inc LNG jetty	Contact - Navigation	Leisure craft in contact with structure	Leisure craft involved in contact with LNG jetty structure	Leisure, All	Leisure Users, Shannon LNG	Disoriented by night or in restricted visibility Lack of knowledge or experience Judgement impaired due to alcohol/fatigue Excessive speed in close proximity LNG Terminal Disregard of Bye-Laws Misjudgement of clearance under berth	Sailing craft contacts jetty at relatively slow speed Damage to boat or rigging but no damage to jetty structure	Leisure craft sinks in vicinity and possible crew and passenger fatalities	0	2	0	0	5	5	2	3	2.91	Proposed jetty is well clear of main channels Area not currently used by leisure craft to any great extent
45	52	Port Approaches up to Ballybunnion Buoy, Ballybunnion Buoy to Doonaha Buoy	Personal Injury	Personal injury to pilot launch crew	Personal injury to launch crew during pilot transfer or operation in exposed areas of Estuary or outside entrance	Port Service Craft, All	Pilot, Pilot Launch, Shannon Foynes Port Company	Severe movement of pilot launch in heavy weather with resulting slips/trips and falls Inappropriate crew footwear, clothing or PPE Incorrect use of safety systems Best lee not made by ship Speed inappropriate for conditions Ship does not achieve the requested heading or alters speed/course substantially during the launches approach Launch lands heavily on ship's side Crew loses grip on rail / manrope while assisting pilot or not holding on or not tethered to rail Inexperience of crew	Minor injury resulting from slip/trip or fall	Serious injury to crew member Crew member falls overboard Potential for fatality	2	0	0	2	5	0	0	5	2.73	
46	51	Port Approaches up to Ballybunnion Buoy, Ballybunnion Buoy to Doonaha Buoy	Personal Injury	Personal injury to Pilot	Pilot suffers personal injury during transfer to or from an LNG Carrier	Port Service Craft, All	Pilot, Shannon Foynes Port Company	Best lee not made by ship or speed inappropriate for conditions and ship does not achieve the requested heading or alters speed/course substantially during the launches approach Pilot ladder not fit for purpose including incorrect length, poor condition or not rigged / sited properly Pilot misjudges timing of transfer to/from launch in adverse sea conditions Severe movement of pilot launch in heavy weather Cox'n unable to keep launch alongside in heavy weather or with propulsive/steering failure Pilot not secured during transfer to foredeck, loses grip on manrope / rails High freeboard of LNG vessels: a combination ladder arrangement is required both in laden and ballast condition. High swell conditions off the port entrance LNG vessels - tendency to roll?	Misjudged transfer between ladder and launch resulting in minor injury to Pilot - strain or sprain	Pilot falls from height onto launch Pilot falls between launch and ship Possible fatality	2	0	0	2	5	0	0	5	2.73	
47	47	North Carrig to Tarbert inc LNG jetty	Mooring Breakout	Passing LNG Carrier causes mooring breakout.	LNG Carrier passing other jetties causes vessels alongside to part moorings.	LNG Carrier, All	ESB, Pilot, Shannon Foynes Port Company, Shannon LNG	LNG Vessel passing too close and/or too fast (interaction) Incorrect position of vessel during transit Misjudgement of manoeuvre in tidal stream/wind; Adverse weather / tidal conditions; Movement attempted in restricted visibility, lack of visual cues Misjudgement Failure to tend moorings (other vessels). Failure to maintain mooring equipment to OCIMF standards (other vessels). Strong cross winds causing leeway / requiring set or additional power to be applied, especially in squally conditions. Vessel unable to get all tugs fast.	One or more mooring lines parted. Damage to gangway	Vessel dragged from berth. Vessel grounds before assistance received.	0	1	0	1	1	5	1	5	2.65	

Ranked Hazard List

Rank No.	Hazard Ref	Affected Areas	Accident Category	Hazard Title	Hazard Detail	Affected Vessel Types	Affected Stakeholders	Possible Causes	Consequence Descriptions		Risk By Consequence Category								Risk Overall	Remarks
									Most Likely (ML)	Worst Credible (WC)	M L				W C					
											People	Property	Environment	Stakeholders	People	Property	Environment	Stakeholders		
48	21	Ballybunnion Buoy to Doonaha Buoy, Doonaha Buoy to North Carrig	Contact - Navigation	Tug contacts navigational mark	Escort tug contacts navigational mark	Port Service Craft, All	Commissioner of Irish Lights, Pilot, Shannon Foynes Port Company, Tugs and Towing Company	Misjudgement of manoeuvre in tidal stream/wind; Adverse weather / tidal conditions; Tug concentrating on LNG carrier and not maintaining lookout; Tug unable to avoid mark when trying to assist vessel;	Superficial damage to tug;	Major damage to tug; Tug unable to assist LNG carrier; Possible loss of navigational mark;	0	3	0	0	0	4	0	3	2.55	Escort tug maybe trying to assist and unable to avoid mark;
49	34	North Carrig to Tarbert inc LNG jetty	Foundering	Line boat capsizes	Line boat capsizes during mooring operations.	Port Service Craft, All	Mooring Crews and Boats, Pilot, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Line caught in screw or bow thruster due to excessive slack or loss of line control on board line boat Vessel fails to slack line Line boat passes over crossed springs which are heaved on by the vessel Poor handling by coxswain Line boat radios cannot be heard over the noise of the engines Lack of training and/or procedures	Line boat moves violently and crewman falls into water. Crew rescued by other line boat or small craft.	Lineboat capsizes with fatality.	2	0	0	0	4	4	1	4	2.45	
50	46	North Carrig to Tarbert inc LNG jetty	Mooring Breakout	Mooring Breakout of another Vessel	Mooring breakout at another berth drifting near LNG Terminal	All, All	ESB, Shannon Ferries, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Moorings not tended on vessel Tension winches not set on the brake Poor condition of mooring lines Mixed moorings Wind loading exceeds breaking strain of lines in use Wind strength and direction not monitored, forecast not obtained Jetty guidelines not followed Tugs unavailable to push on due to commitments to other shipping	Tugs push vessel alongside wharf while extra lines or storm lines rigged	Vessel breaks free and drifts towards LNG terminal on tide before tugs can assist or vessel can mobilise. Escalation if vessel contacts LNG Carrier	0	0	0	0	3	6	0	6	2.44	Vessel that have broken adrift have been observed to drift with the tide along the line of the channel and have not come near any existing of proposed berth
51	38	North Carrig to Tarbert inc LNG jetty	Mooring Breakout	Mooring Breakout of berthed LNG Carrier	Mooring breakout of LNG Carrier during cargo transfer alongside jetty	LNG Carrier, All	ESB, Shannon Ferries, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	LNG Carrier ranges alongside due to tide and/or wind effects Vessel passing to close to berthed LNG Carrier Moorings of vessel slack or not tended, poor deck watch Operating limited exceeded Poor maintenance standards on LNGC or jetty Vessel moorings not suitable for terminal (not matched) Inadequate terminal information exchange Inappropriate chartering of LNG Carrier for terminal Inadequate jetty procedures (training/monitoring/compliance)	Vessel alongside due to slack moorings. Moorings hold, no damage or spill	Strong tides / wind causes LNGC to range heavily with possible mooring breakout. Manifold separates with small cargo spill before auto shutdown Damage to gangway. Escalation to full breakout before tugs can assist	0	0	0	0	3	6	0	6	2.44	
52	1	North Carrig to Tarbert inc LNG jetty	Cargo Release	Cargo Release - Vapour	Uncontrolled LNG gas released from vessel. Failure of cargo containment system on board.	LNG Carrier, All	Shannon Foynes Port Company, Shannon LNG	Pipeline rupture / failure. Valve / compressor gland failure. Machinery failure (reliquification plant).	Limited release contained locally and eliminated by ships crew.	Major damage to plant - unable to effectively isolate. Gas in contact with ignition source and fire occurs. Possible injuries / fatalities.	0	0	0	3	3	2	0	2	2.42	Breakdown of or gap in policing of prohibited zone by water craft creating ignition source
53	43	Port Approaches up to Ballybunnion Buoy, Ballybunnion Buoy to Doonaha Buoy, Doonaha Buoy to North Carrig, North Carrig to Tarbert inc LNG jetty	Grounding	Pilot launch grounding	Pilot launch grounds whilst attending LNG Carrier	Port Service Craft, All	Pilot, Pilot Launch, Shannon Foynes Port Company	Misjudgement of manoeuvre in tidal stream/wind. Propulsion/steering/control systems failure at critical stage Failure to keep proper lookout Inattention to track while navigating Radar breakdown in restricted visibility Judgement impaired due to fatigue.	Glancing grounding with minor damage to hull Possible damage to propellers / rudders but able to return to berth	Launch goes ashore in heavy swell and broaches Fatalities possible Loss of pilot boat and delays to commercial vessels	0	1	0	0	0	4	1	4	2.09	
54	49	Ballybunnion Buoy to Doonaha Buoy, Doonaha Buoy to North Carrig, North Carrig to Tarbert inc LNG jetty	Near Miss	Towline parts	Towline parts during approach, transit and/or berthing	Port Service Craft, All	Pilot, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Excessive wear on tow line Sharp edges on fairleads Poor towline leads not enough towline used especially due to high freeboards Line of insufficient strength Tugmaster manoeuvring error Excessive sea movements Poor condition of towline	Delay in operation awaiting reconnection Raising of tension among other tow craft	Insufficient redundancy of towcraft Loss of control Delay to vessel or abort of transit until new line available Secondary hazard - Grounding Secondary Hazrad - Collision with other vessels	0	2	0	0	0	2	0	2	1.67	High freeboards and/or incorrect length of tow line can lead to higher loadings on towlines. Dynamic towing can increase shock loadings to towlines. Shock loadings during connection/ can be more frequent but can be controlled by freewheeling
55	48	Port Approaches up to Ballybunnion Buoy, Ballybunnion Buoy to Doonaha Buoy, Doonaha Buoy to North Carrig, North Carrig to Tarbert inc LNG jetty	Near Miss	LNG Carrier in close quarters situation with other vessel	LNG Carrier in close quarters situation with another vessel	LNG Carrier, All	Pilot, Shannon Foynes Port Company, Shannon LNG, Tugs and Towing Company	Channel usage conflict. Disregard of Port Control advice regarding potential traffic conflict. Misjudgement or miscommunication by either/both vessels. Infringing vessel has difficulty in clearing path of LNG Carrier committed to channel. Anchored vessel swung across channel by tide/wind. Inadequate anchor watch. Not monitoring Port Control VHF channel for weather forecasts/warnings. Engines not ready for immediate manoeuvre on anchored vessel.	Close quarters situation but collision averted. Internal investigation delays.	Very close quarters situation requiring reporting to marine authorities. Delays possible during investigation.	0	0	0	0	0	0	0	4	1.39	Presence of other vessels in vicinity likely to be governed and limited by precautionary manoeuvring area.