LIST OF PMSC RISK ASSESSMENTS

Risk Assessment Number	Risk Assessment Name	Reviewed
POTLL PMSC RA 01-03	POTLL - Non Tidal Arrival and Sailing	22/04/2024
POTLL PMSC RA 02-03	POTLL - Tidal arriving and Sailing	22/04/2024
POTLL PMSC RA 03-03	POT11L - Tidal Arriving and Sailing	22/04/2024
POTLL PMSC RA 04-03	POTLL- Non tidal Bunkering Operations	22/04/2024
POTLL PMSC RA 05-03	POTLL - Tidal Bunkering Operations	22/04/2024
POTLL PMSC RA 06-03	POT11L - Tidal Bunkering operation	22/04/2024
POTLL PMSC RA 07-03	POTLL - Non tidal Marine Pollution	22/04/2024
POTLL PMSC RA 08-03	POTLL and POT11L - Tidal Marine pollution	22/04/2024
POTLL PMSC RA 09-03	POTLL Non tidal Diving Operation	22/04/2024
POTLL PMSC RA 10-03	POTLL and POT11 - Tidal Diving Operations	22/04/2024
POTLL PMSC RA 11-03	POTLL - Non tidal towage operations	22/04/2024
POTLL PMSC RA 12-03	POTLL - Tidal Towage Operations	22/04/2024
POTLL PMSC RA 13-03	POT11L - tidal Towage operations	22/04/2024

Red indicates last Reviewed

PMSC RISK ASSESSMENT - RISK RANKING

Rank	HazardID	Hazard What can go wrong (Event leading to a consequence)	Hazard Scoring
1	POTLL PMSC RA 03-03 1.2 Contact	Contact	7.375
2	POTLL PMSC RA 02-03 1.2 Contact	Contact	6.75
3	POTLL PMSC RA 01-03 1.2 Contact	Contact	6.625
4	POTLL PMSC RA 11-03 1.1 Capsiz/Flooding	Capsize/Flooding	6.5
5	POTLL PMSC RA 01-03 1.1 Collision/Allision	Collision/ allision	6.375
5	POTLL PMSC RA 01-03 1.5 Fire/Explosion	Fire/Explosion	6.375
7	POTLL PMSC RA 11-03 1.3 Contact	Contact	6
8	POTLL PMSC RA 05-03 1.4 Fire/Explosion	Fire/Explosion	5.625
8	POTLL PMSC RA 06-03 1.4 Fire Explosion	Fire/Explosion	5.625
8	POTLL PMSC RA 11-03 1.2 Fire	Fire	5.625
11	POTLL PMSC RA 01-03 1.6 loss of containment (oil products)	Loss of Containment (Oil Product)	5.5
11	POTLL PMSC RA 02-03 1.3 Grounding	Grounding	5.5
11	POTLL PMSC RA 03-03 1.3 Grounding	Grounding	5.5
11	POTLL PMSC RA 04-03 1.4 Fire/Explosion	Fire/Explosion	5.5
15	POTLL PMSC RA 12-03 1.1 Capsiz/Flooding	Capsize/Flooding	5.375
15	POTLL PMSC RA 12-03 1.2 Fire	Fire	5.375
17	POTLL PMSC RA 12-03 1.3 Contact	Contact	5.25
18	POTLL PMSC RA 05-03 1.2 Contact	Contact	5.125
18	POTLL PMSC RA 06-03 1.2 Contact	Contact	5.125
18	POTLL PMSC RA 12-03 1.4 Collision	Collision	5.125
21	POTLL PMSC RA 01-03 1.4 sinking/capsize	Sinking/Capsize	5
21	POTLL PMSC RA 04-03 1.3 Loss of Containment (Oil Product)	Loss of Containment (Oil Product)	5
23	POTLL PMSC RA 04-03 1.2 Contact	Contact	4.75
24	POTLL PMSC RA 05-03 1.3 Loss of Containment (Oil Product)	Loss of containment (Oil Product)	4.625
24	POTLL PMSC RA 06-03 1.3 Loss of Containment (Oil Product)	Loss of containment (Oil Product)	4.625

24	POTLL PMSC RA 13-03 1.4 Collision	Collision	4.625
27	POTLL PMSC RA 01-03 1.3 Grounding	Grounding	4.5
27	POTLL PMSC RA 03-03 1.6 Loss of Containment (Oil Products)	Loss of Containment (Oil Proiducts)	4.5
27	POTLL PMSC RA 05-03 1.1 Collision with bunker and receiving vessel	Collision with bunker and reciveing vessel	4.5
27	POTLL PMSC RA 06-03 1.1 Collision with bunker and receiving vessel	Collision with bunker and receiving vessel	4.5
27	POTLL PMSC RA 11-03 1.4 Collision	Collision	4.5
27	POTLL PMSC RA 12-03 1.6 Man overboard/personal injury	Man Overboard/Personal Injury	4.5
33	POTLL PMSC RA 09-03 1.1 Swamping/ Turbulance/ Interaction	Swamping/Turbulance/Interaction	4.25
34	POTLL PMSC RA 02-03 1.5 Fire/Explosion	Fire/Explosion	4.125
34	POTLL PMSC RA 02-03 1.6 Loss of Containment(Oil Products)	Loss of containment (Oil Products)	4.125
34	POTLL PMSC RA 03-03 1.5 Fire/Explosion	Fire/Explosion	4.125
34	POTLL PMSC RA 07-03 1.1 Loss of containment (Oil Product)	Loss of containment (Oil product)	4.13
38	POTLL PMSC RA 02-03 1.1 Collision/Allision	Collision/Allision	4
38	POTLL PMSC RA 02-03 1.4 Sinking/Capsize	Sinking/Capsize	4
38	POTLL PMSC RA 03-03 1.1 Collision Allision	Collision/ Allsion	4
38	POTLL PMSC RA 03-03 1.4 Sinking/Capsize	Sinking/Capsize	4
42	POTLL PMSC RA 04-03 1.1 Collision with bunker and receiving vessel	Collision with bunker and receiving vessel	3.75
42	POTLL PMSC RA 11-03 1.6 Man overboard/personal injury	Man overboard/personal injury	3.75
42	POTLL PMSC RA 12-03 1.5 Grounding	Grounding	3.75
45	POTLL PMSC RA 10-03 1.2 Contact/Collision	Contact/Collision	3.625
46	POTLL PMSC RA 13-03 1.1 Capsize/Flooding	Capsize/ Flooding	3.5
46	POTLL PMSC RA 13-03 1.2 Fire	Fire	3.5
46	POTLL PMSC RA 13-03 1.5 Grounding	Grounding	3.5
49	POTLL PMSC RA 10-03 1.1 Swamping/Turbulance/Interaction	Swamping/Turbulance/Interaction	3.375
49	POTLL PMSC RA 13-03 1.3 Contact	Contact	3.375
51	POTLL PMSC RA 09-03 1.2 Contact/Collision	Contact/Collision	3.25
52	POTLL PMSC RA 11-03 1.5 Grounding	Grounding	2.5
52	POTLL PMSC RA 13-03 1.6 Man overboard	Man overboard	2.5

Rank	Risk Assessment No.	Risk Assessment Name	Average Score
1	POTLL PMSC RA 01-01	POTLL - Non Tidal Arrival and Sailing	5.729
2	POTLL PMSC RA 05-01	POTLL - Tidal Bunkering Operations	4.969
2	POTLL PMSC RA 06-01	POT11L - Tidal Bunkering operation	4.969
4	POTLL PMSC RA 03-01	POT11L - Tidal Arriving and Sailing	4.917
5	POTLL PMSC RA 12-01	POTLL - Tidal Towage Operations	4.896
6	POTLL PMSC RA 11-01	POTLL - Non tidal towage operations	4.813
7	POTLL PMSC RA 02-01	POTLL - Tidal arriving and Sailing	4.750
7	POTLL PMSC RA 04-01	POTLL- Non tidal Bunkering Operations	4.750
9	POTLL PMSC RA 07-01	POTLL - Non tidal Marine Pollution	4.125
10	POTLL PMSC RA 09-01	POTLL Non tidal Diving Operation	3.750
11	POTLL PMSC RA 13-01	POT11L - tidal Towage operations	3.583
12	POTLL PMSC RA 10-01	POTLL and POT11 - Tidal Diving Operations	3.500

Risk Assessment Scoring Matrix

LIKELIHOOD

1 = Extremely unlikely (More than 100 years)
2 = Remote (10 - 99 years)
3 = Reasonably likely (1 - 9 years)
4 = Likely (Once per Year)
5 = Frequent (More than once per year)

CONSEQUENCE

PEOPLE:
1 = None
2 = Minor, single slight Injury
3 = Slight, multiple moderate or single major injury
4 = Serious, multiple major injuries or single fatality
5 = Major, more than 1 fatality

PROPERTY:
1 = negligible < £5000
2 = Minor > £5000
3 = Moderate >£50,000
4 = Serious, > £500,000
5 = major, > £2,000,000

ENVIRONMENT:
1 = Negligable, No Action required
2 = Minor spill Tier 1 local response,
3 = Moderate spill, Tier 2 some outside assistance
4 = Moderate spill, Tier 2 greater outside assistance
5 = Major spill, Tier 3 national response

BUSINESS:
1 = Negligible impact < £5000
2 = Minor impact > £5000
3 = Moderate impact > £50,000, bad local publicity, short term reduction of activity.
4 = Serious Impact, >£500,000, bad widespread publicity, temporary Port Facility shutdown.
5 = Major impact, > £2,000,000, Port facility Closes for more than 1-2 days.

OVERALL RISK

Likelihood						
	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
		Consequence				

Red indicates last Reviewed

AMBER Hazards with risk factors within these bands (6 - 10) are termed “consider”. These lower risk factors are considered acceptable, but still need careful monitoring to ensure that everything has been done to reduce the consequences and likelihood.

GREEN The lower numbers(5 and below) in the matrix are considered “low-risk”, but should still be monitored to ensure that controls remain effective.

POTLL Controls - In Dock and River Berths

Marine Department Scheduling
Marine Department Mooring Reviews
Bunker Checklist/Procedures
Marine Department Dock Patrols
POTLL UKC
POTLL NtMs and PNtMs
POTLL Emergency Procedures
POTLL Port Information and Marine Guidelines
POTLL Weather forecasting
POTLL Wind Parameters
POTLL Fog Procedures
POTLL Surveys
POTLL Dredging program
Dock Byelaws
POTLL Mooring Manual
POTLL Permit to Manouevre
POTLL OPRC
POTLL Tier 2 Responders
Lock Gates
POTEMPLA
POTLL Ruling Depths
POTLL CCTV
POTLL Ebb Tide Procedure
POT11L Byelaws
POT11L and PLA MOU
POTLL Tier 2 responder
Bridge simulation Reports
T2 Nav Risk Assessment

PLA Controls - River Berths and Tidal lock Arr/Dep

PLA Pilotage Directions
PLA VTS Service
PLA Hydrographic Surveys
PLA Tidal Information
PLA Ship Towage Code of Practice
PLA Craft Towage Code of Practice
PLA Byelaws and General Directions
PLA NtMs
PLA Tosca

External Controls

Ship towage

FORTH PORTS LIMITED
Risk Assessment

INSERT TITLE

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)				
				Likelihood	Overall Risk				Likelihood	Overall Risk			
					People	Property	Environment	Business		People	Property	Environment	Business
1.1													
1.2													
1.3													
1.4													
1.5													
			Risk Ranking										

FORTH PORTS LIMITED
Risk Assessment

Port of Tilbury - Non Tidal Arrival and Sailing

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
				Likelihood	Overall Risk				Likelihood	Overall Risk					
					People	Property	Environment	Business		People	Property	Environment	Business		
1.1	Collision	Technical Failure Bridge Team Error Environmental Conditions	POTLL Permit to Manoeuvre POTLL Berthing Advisors POTLL Marine Department scheduling POTLL PNTMs and NTMs POTLL Ruling Depths POTLL Marine Guidelines and Port Information POTLL Weather forecasting POTLL Wind Parameters POTLL Restricted Visibility procedures POTLL Marine Emergency plans POTLL CCTV POTEMPLA POTLL OPRC POTLL Tier 2 Responders	3	3	6	3	3	2	10	10	6	10	6.375	Most Likely - Contact between 2 vessels manouvring in dock. No injuries, light/superficial damage to one or both vessels. No interuption to port trade. Worst Credible - Collision between vessel departing in dock berth and a vessel departing lock and manouvring for dock berth. resulting in fatalites, loss of vessel and oil spill
1.2	Contact	Technical Failure Bridge Team Error Environmental Conditions Quayside Obstruction	POTLL Permit to Manoeuvre POTLL Berthing Advisors POTLL Marine Department scheduling POTLL PNTMs and NTMs POTLL Ruling depths POTLL Marine Guidelines and Port Information POTLL weather forecasting POTLL Wind Parameters POTLL Restricted Visibility Procudures POTLL Marine emergency plans POTLL CCTV POTEMPLA POTLL OPRC POTLL Tier 2 Responders PLA Ship towage Code of Practice Ship Towage	5	5	10	5	5	2	2	10	6	10	6.625	Most Likely - Light contact with quayside during approach/departure from berth, superficial damage ie scuffing to painwork and concrete. no damage and no interuption to port trade Worst Credible - Contact with the inner lock gates during departure from dock rendering the lock gates U/S resulting in loss of trade and revenue for the dock. No injuries
1.3	Grounding	Collision Contact Grounding Technical Failure Human Error Environmental Conditions	POTLL Surveys POTLL Dredging program POTLL Permit to Manoeuvre POTLL Ruling Depths POTLL Marine Department scheduling POTLL PNTMs and NtMs POTLL Marine Guidelines and Port information POTLL weather forecasting POTLL emergency plans POTLL UKC POTEMPLA PLA Ship towage Code of Practice Ship Towage	5	5	5	5	5	2	2	4	2	8	4.5	Most Likely: Vessel touches bottom while manouvring for berth, vessel does not take bottom, engines push through the mud and vessel continues to destination with no interuption. Worst Credible: Vessel takes to ground en route to berth, cannot refloat and requires increase in dock level and tug assistance. Potential interuption to port trade.
1.4	Sinking / Capsize	Collision Contact Grounding Technical Failure Failure of Vessel Stability Human Error Environmental Conditions	POTLL Marine Department Scheduling POTLL Berthing Advisors POTLL weather forecasting POTLL Wind parameters POTLL Restricted visibility procedures POTLL PNtMs and NtMs POTLL Marine Guidelines and Port information POTLL mooring manual POTLL Marine emergency procedures POTLL Surveys POTLL UKC POTLL Ruling Depths POTEMPLA Ship Towage	2	2	4	2	2	3	3	9	9	9	5	Most Likely: Small boatmens vessel swamped by wash or environemntal conditions leading to loss of stability and capsize. No injuries, vessel remains bouyant and is litted onto quayside. sheen on the water due to fuel escaping from breathers, Worst Credible: Machinery deficiency cause vessel to take on water, bilge pumps overwhelmed by volume and vessel continues to take on water. Vessel stranded in dock, requiring tug assistance to move.
1.5	Fire / Explosion	Collision Contact Grounding Human Error Technical Failure Loss of Containment	POTLL Permit to Manoeuvre POTLL Berthing Advisors POTLL Marine Department Scheduling POTLL UKC POTLL Weather forecasting POTLL Wind Parameters POTLL Restricted Visibility Procedures POTLL PNtMs and NtMs POTLL Marine Guidelines and Port information POTLL mooring manual POTLL emergency procedures POTEMPLA POTLL OPRC POTLL Tier 2 Responders PLA Ship towage Code of Practice Ship Towage	3	3	6	3	3	2	10	8	10	8	6.375	Most Likely: Fire on vessel whilst loading scrap metal, fire contained and extinguished using on board FFE. No injuries, very minor damage Worst Credible:Fire on a vessel loading scrap including to lithium ion batteries. external assistance required and delays to shipping caused. causing multiple major injuries or a single fatality
1.6	Loss of Containment (Oil Products)	Collision Grounding Human Error Contact Technical Failure Sinking / Capsizing Fire / Explosion Environmental Conditions	Marine Department scheduling POTLL Berthing Advisors POTLL Bunkering procedure and checklist POTLL Surveys POTLL Dredging program POTLL Marine Guidelines and Port information POTLL OPRC POTLL Tier 2 responders POTLL Ruling Depth document POTLL Lock Gates POTEMPLA POTLL OPRC POTLL Tier 2 responders PLA Ship towage Code of Practice Ship Towage	4	4	4	4	4	2	4	6	8	10	5.5	Most Likely: Loss of small amount of fuel during on board bunkering operations. Spilt fuel contained on deck. Worst Credible: Collision holes fuel tank resulting in large quatity of heavy fuel oil discharged into the dock. Tier 2 response and interuption to Port busiess.

FORTH PORTS LIMITED
Risk Assessment

Port of Tilbury - Tidal Arrival / Sailing - PLA Waters to River Berths and Lock

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
				Likelihood	Overall Risk				Likelihood	Overall Risk					
					People	Property	Environment	Business		People	Property	Environment	Business		
1.1	Collision	Technical Failure Bridge Team Error Environmental Conditions	POTLL Marine Department scheduling POTLL PNTMs and NTMs POTLL Marine Guidelines and Port Information POTLL weather forecasting POTLL Marine emergency plans PLA Pilotage Directions PLA VTS service PLA recreational User Guide PLA NtMs PLA Byelaws and General Directions PLA Ship towage Code of Practice Ship Towage Bridge Simulation	3	3	6	3	3	1	5	4	4	4	4	Most Likely - Collision between LCT vessel manouvring to/from berth at slow speed and a recreational vessel from West Thurrock Yacht Club Worst Credible - Collision between LCT vessel manouvring off berth and a specified tanker bound for the Navigator terminal resulting in serious damage to one or both vessels above and below the waterline
1.2	Contact	Technical Failure Bridge Team Error Environmental Conditions Failure of Aids to Navigation Quayside Obstruction	POTLL Marine Department scheduling POTLL PNTMs and NTMs POTLL Marine Guidelines and Port Information POTLL weather forecasting POTLL emergency plans PLA Pilotage Directions PLA VTS service PLA NtMs PLA Byelaws and General Directions PLA recreational User Guide PLA Ship towage Code of Practice Ship Towage Bridge Simulation	4	4	8	4	4	2	10	8	6	10	6.75	Most Likely - Low speed low energy contact between LCT feeder vessel and quayside resulting in scuffing scraping of the concreete. No injuries, no disruption to Port. Worst Credible - Contact with LCT gantry crane during arrival/departure resulting in loss of crane, loss of life and substantial dmagae to vessel and berth.
1.3	Grounding	Technical Failure Bridge Team Error Environmental Conditions Surveying Omission Failure of Aids to Navigation	POTLL Conservency program POTLL Ruling Depths POTLL Marine Department scheduling POTLL PNTMs and NtMs POTLL Marine Guidelines and Port information POTLL weather forecasting POTLL emergency plans POTLL UKC PLA Hydrographic department PLA VTS Service PLA pilotage Directions PLA NtMs PLA Byelaws and General Directions PLA Ship towage Code of Practice Ship Towage Bridge Simulation	3	3	6	3	6	2	4	8	6	8	5.5	Most likely - Grounding on soft mud while departing Tilbury Grain Inner terminal on the flood tide, refloated on the rising tide. No damage to vessel, no injury and no interuption to port trade Worst Credible - Grounding during Arrival/Departure from LCT on fal.ling tide, vessel cannot refloat, berths blocked for at least one tide. Substantial disruption to terminal, potential damage to grounded vessel, no injuries.
1.4	Sinking Capsize	Collision Contact Grounding Technical Failure Failure of Vessel Stability Human Error Environmental Conditions	POTLL Marine Department Scheduling POTLL weather forecasting POTLL PNtMs and NtMs POTLL Marine Guidelines and Port information POTLL mooring manual POTLL emergency procedures PLA VTS service PLA Pilotage directions PLA ship towage code of practice Ship Towage Bridge Simulation	2	2	6	4	2	1	5	5	4	4	4	Small craft swamped during mooring activities resulting in sinking of craft Loss of stability during cargo operations resulting in sinking, potential for serious injury/loss of life loss of operational berth, pollution, closure of Tilbury Dock
1.5	Fire/Explosion	Collision Contact Grounding Human Error Technical Failure Loss of Containment	POTLL Marine Department Scheduling POTLL weather forecasting POTLL PNtMs and NtMs POTLL Marine Guidelines and Port information POTLL mooring manual POTLL emergency procedures PLA VTS service PLA Pilotage directions PLA ship towage code of practice PLA NtMs PLA Byelaws and General Directions Ship Towage Bridge Simulation	3	3	6	3	3	1	5	5	4	4	4.125	Most Likely: small fire on board due to hot works, extinguised by crew. Minor dmagae to vessel paint work, no injuries, no disruption to the Port. Worst Credible: Engine room fire caused my machinery malfunction, beyond crews capability to extinguish on vessel containing class 1 or 7 hazardous cargo. Multiple injuries to crew, substantial damage to vessel and disruption to the Port.
1.6	Loss of containment (Oil products)	Collision Grounding Human Error Contact Technical Failure Sinking / Capsizing Fire / Explosion Environmental Conditions	Marine Department scheduling POTLL Bunkering procedure and checklist POTLL Surveys POTLL dredging program POTLL Marine Guidelines and Port information POTLL Emergency plans POTLL OPRC POTLL Ruling Depth document POTLL Tier 2 responder PLA Tosca PLA VTS service PLA Pilotage directions PLA ship towage code of practice PLA NtMs PLA Byelaws and General Directions Ship Towage Bridge Simulation	4	4	4	4	4	1	5	5	5	5	4.125	Most Likely: Loss of small amount of fuel during pn board bunkering operations, ie mobile generator. Spilt fuesl contained on deck. Worst Credible: Collision holes fuel tank resulting in large quatity of heavy fuel oil discharged into the Thames. Tier 2 response and interuption to Port business.

FORTH PORTS LIMITED
Risk Assessment

Port of Tilbury 2 - Arrival and Sailing PLA waters to Berth

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
					Overall Risk					Overall Risk					
				Likelihood	People	Property	Environment	Business	Likelihood	People	Property	Environment	Business		
1.1	Collision	Technical Failure Bridge Team Error Environmental Conditions	POTLL Permit to Manoeuvre POTLL Berthing Advisors POTLL Marine Department scheduling POTLL PNTMs and NTMs POTLL Ruling Depths POTLL Marine Guidelines and Port Information POTLL Weather forecasting POTLL Wind Parameters POTLL Restricted Visibility procedures POTLL Marine Emergency plans POTLL CCTV POTEMPLA POTLL OPRC POTLL Tier 2 Responders PLA Ship towage Code of Practice Ship Towage Bridge Simulation T2 Navigational Risk Assessment	3	3	6	3	3	1	5	4	4	4	4	Most Likely - Collision between vessel manouvring to/from berth at slow speed and a boatmens vessel Worst Credible - Collision between vessel manouvring off berth and a specified tanker bound for the Navigator terminal resulting in serious damage to one or both vessels above and below the waterline
1.2	Contact	Technical Failure Bridge Team Error Environmental Conditions Quayside Obstruction	POTLL Permit to Manouevre POTLL Berthing Advisors POTLL Marine Department scheduling POTLL PNTMs and NTMs POTLL Ruling depths POTLL Marine Guidelines and Port Information POTLL weather forecasting POTLL Wind Parameters POTLL Restircted Visibility Procudures POTLL Marine emergency plans POTLL CCTV POTEMPLA POTLL OPRC POTLL Tier 2 Responders PLA Ship towage Code of Practice Ship Towage Bridge Simulation T2 Navigational Risk Assessment	5	5	10	5	5	2	10	8	6	10	7.375	Most Likely - Low speed low energy contact between vessel and quayside resulting in scuffing scraping of the concreete. No injuries, no disruption to Port. Worst Credible - Contact with shoresie infrastructuree during arrivaldeparture resulting in loss ofinfrastructure, loss of life and substantial dmagae to vessel and berth.
1.3	Grounding	Collision Contact Grounding Technical Failure Human Error Environmental Conditions	POTLL Surveys POTLL Dredging program POTLL Permit to Manoeuvre POTLL Ruling Depths POTLL Marine Department scheduling POTLL PNTMs and NtMs POTLL Marine Guidelines and Port information POTLL weather forecasting POTLL emergency plans POTLL UKC POTEMPLA PLA Ship towage Code of Practice Ship Towage	3	3	6	3	5	2	4	8	6	8	5.5	Most likely - Grounding on soft mud while departing Tilbury Grain Inner terminal on the flood tide, refloated on the rising tide. No damage to vessel, no injury and no interuption to port trade Worst Credible - Grounding during Arrival/Departure from LCT on faLling tide, vessel cannot refloat, berths blocked for at least one tide. Substantial disruption to terminal, potential damage to grounded vessel, no injuries.
1.4	Sinking / Capsize	Collision Contact Grounding Technical Failure Failure of Vessel Stability Human Error Environmental Conditions	POTLL Marine Department Scheduling POTLL Berthing Advisors POTLL weather forecasting POTLL Wind parameters POTLL Restricted visibility procedures POTLL PNtMs and NtMs POTLL Marine Guidelines and Port information POTLL mooring manual POTLL Marine emergency procedures POTLL Surveys POTLL UKC POTLL Ruling Depths POTEMPLA Ship Towage Bridge Simulation T2 Navigational Risk Assessment	2	2	6	4	2	1	5	5	4	4	4	Small craft swamped during mooring activities resulting in sinking of craft Loss of stability during cargo operations resulting in sinking, potential for serious injury/loss of life loss of operational berth, pollution, closure of the berth
1.5	Sinking / Capsize	Collision Contact Grounding Technical Failure Failure of Vessel Stability Human Error Environmental Conditions	Marine Department scheduling POTLL Bunkering procedure and checklist POTLL Surveys POTLL dredging program POTLL Marine Guidelines and Port information POTLL Emergency plans POTLL OPRC POTLL Ruling Depth document POTLL Tier 2 responder PLA Tosca PLA VTS service PLA Pilotage directions PLA ship towage code of practice PLA NtMs PLA Byelaws and General Directions Ship Towage Bridge Simulation T2 Navigational Risk Assessment	3	3	6	3	3	1	5	5	4	4	4.125	Most Likely: small fire on board due to hot works, extinguised by crew. Minor dmagae to vessel paint work, no injuries, no disruption to the Port. Worst Credible: Engine room fire caused my machinery malfunction, beyond crews capability to extinguish on vessel containing class 1 or 7 hazardous cargo. Multiple injuries to crew, substantial damage to vessel and disruption to the Port.
1.6	Loss of containment (Oil products)	Collision Grounding Human Error Contact Technical Failure Sinking / Capsizing Fire / Explosion Environmental Conditions	Marine Department scheduling POTLL Bunkering procedure and checklist POTLL Surveys POTLL dredging program POTLL Marine Guidelines and Port information POTLL Emergency plans POTLL OPRC POTLL Ruling Depth document POTLL Tier 2 responder PLA Tosca PLA VTS service PLA Pilotage directions PLA ship towage code of practice PLA NtMs PLA Byelaws and General Directions Ship Towage Bridge Simulation T2 Navigational Risk Assessment	4	4	4	4	4	1	5	5	5	5	4.5	Most Likely: Loss of small amount of fuel during pn board bunkering operations, ie mobile generator. Spill fuesl contained on deck. Worst Credible: Collision holes fuel tank resulting in large quatity of heavy fuel oil discharged into the Thames. Tier 2 response and interuption to Port business.

FORTH PORTS LIMITED
Risk Assessment

Port of Tilbury - Non Tidal Bunkering Operations

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
				Likelihood	Overall Risk				Likelihood	Overall Risk					
					People	Property	Environment	Business		People	Property	Environment	Business		
1.1	Collision with bunker vessel and receiving vessel	Technical Failure Bridge Team Error Environmental Conditions	POTLL Permit to Manouevre Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL tug requirements POTLL Mooring manual POTLL Emergency plans POTLL Emergency exercises POTLL OPRC Plan POTLL Tier 2 responders Lock gates POTLL Berthing Advisors PLA Ship Towage Code of Practice Ship Towage	2	2	2	2	2	2	4	6	6	6	3.75	Most Likely: Low speed collision between bunker vessel and receiving vessel, no damage to either vessel. Worst credible: Collision caused by equipment failure, with collision resulting in damage and hole below the waterline in recieving vessel.
1.2	Contact	Technical Failure Bridge Team Error Environmental Conditions Mooring Failure	POTLL Permit to Manouevre POTLL Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL tug requirements POTLL Mooring manual POTLL Emergency plans POTLL Emergency exercises POTLL OPRC Plan POTLL Tier 2 responders Lock gates POTLL Berthing Advisors PLA Ship Towage Code of Practice Ship Towage	3	3	3	3	3	2	4	6	8	8	4.75	Most Likely: Contact by passing vessel whislt bunker resulting in no damage and no oil spill Worst credible: Contact by passing vessel whislt bunker resulting in damage to oil spill bunker hose before fuel shut off leading to in dock pollution and tier 2 response.
1.3	Loss of Conrainment (Oil Products)	Technical Failure Human Error Collision Grounding Mooring Failure Sinking Fie/Expolsion Contact	POTLL Permit to Manouevre Marine Department scheduling and traffic organisation POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL Mooring manual POTLL Emergency plans POTLL Emergency exercises POTLL OPRC Plan POTLL Tier 2 responders Lock gates POTLL Berthing Advisors PLA Ship Towage Code of Practice Ship Towage	3	3	3	3	3	2	8	6	8	6	5	Most likely: failed fitting on bunker hose resulting in small loss of prdiuct on deck, scuppers closed, on deck clean up only, no pollution in dock. Worst Credible: Due to communication errors hose disconnected imediately before pumping begins. Volume of oil product lost in dock requiring tier 2 response.
1.4	Fire/Explosion	Technical Failure Human Error Collision Grounding Mooring Failure Sinking Fie/Expolsion Contact	POTLL Permit to Manouevre POTLL Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL Mooring manual POTLL Emergency plans POTLL Emergency exercises POTLL OPRC Plan POTLL Tier 2 responders Lock gates POTLL Berthing Advisors PLA Ship Towage Code of Practice Ship Towage	2	3	3	3	3	2	8	8	8	8	5.5	Most likely: small fire on board. Fire isolated and dealt with by crew. No damage, no injuries. Worst credible: fire/explosion caused by malfunctioning equipment leading to injuries on crew on board and loss of oil into dock requiring tier 2 response

FORTH PORTS LIMITED
Risk Assessment

Port of Tilbury - Tidal Bunkering Operations (from Road tanker)

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
				Likelihood	Overall Risk				Likelihood	Overall Risk					
					People	Property	Environment	Business		People	Property	Environment	Business		
1.1	Collision	Technical Failure Bridge Team Error Environmental Conditions	POTLL Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL tug requirements POTLL Mooring manual POTLL Marine Department Emergency plans POTLL OPRC Plan POTLL Tier 2 responder POT11L MOU POT11L byelaws PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation	3	3	3	3	3	2	4	8	6	6	4.5	Most Likely: Low energy low speed collision between small bunker barge and receiving vessel while manoeuvring alongside leading to very minor damage to one or both vessels, no pollution and no injury Worst credible: Medium energy medium speed collision between bunker barge and recieving vessel caused by equipment malfunction leading to damage at or above the waterline and holoed fuel tank needing tier 2 response.
1.2	Contact	Technical Failure Bridge Team Error Environmental Conditions Mooring Failure	Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL tug requirements POTLL Mooring manual POT11L MOU POT11L byelaws POTLL Marine Department Emergency plans POTLL OPRC Plan POTLL Tier 2 responders PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation	3	3	6	3	3	2	4	6	8	8	5.125	Most Likely: arted mooring line leads to low energy contact with quay during bunkering operations. Bunkers ceased while vessel resecured. No damage. Worst Credible: contact with shoreside infrastructure during bunkering operations due to failed mooring lines, bunker hose disconnected before fuel shut off leading to in dock pollution and tier 2 response.
1.3	Loss of Conrainment (Oil Products)	Technical Failure Human Error Collision Grounding Mooring Failure Sinking Fie/Expolsion Contact	POTLL Permit to Manouevre POTLL Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL Mooring manual POT11L MOU POT11L byelaws POTLL Marine Department Emergency plans POTLL OPRC Plan POTLL Tier 2 responders PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation	3	3	6	3	3	2	4	2	8	8	4.625	Most likely: failed fitting on bunker hose resulting in small loss of prdiuct on deck, scuppers closed, on deck clean up only, no pollution in dock. Worst Credible: Due to communication errors hose disconnected imediately before pumping begins. Volume of oil product lost over the side requiring tier 2 response.
1.4	Fire/Explosion	Technical Failure Human Error Collision Grounding Mooring Failure Sinking Fie/Expolsion Contact	POTLL Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL Mooring manual POT11L MOU POT11L byelaws POTLL Marine Department Emergency plans POTLL OPRC Plan POTLL Tier 2 responders PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation	3	3	6	3	3	2	6	8	8	8	5.625	Most likely: small fire on board unconnected to bunkering operation. Fire isolated and dealt with by crew. No dmage, no injuries. Worst credible: fire/explosion caused by malfunctioning equipment leading to injuries on crew on board and loss of oil into dock requiring tier 2 response

FORTH PORTS LIMITED
Risk Assessment

Port of Tilbury 2 - Tidal Bunkering Operations

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
				Likelihood	Overall Risk				Likelihood	Overall Risk					
					People	Property	Environment	Business		People	Property	Environment	Business		
1.1	Collision with bunker vessel and receiving vessel	Technical Failure Bridge Team Error Environmental Conditions	POTLL Marine Department scheduling POT11L Byelaws POT11L and PLA MOU POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL tug requirements POTLL Mooring manual POTLL Marine Department Emergency plans POTLL OPRC Plan POTLL Tier 2 responder PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation T2 Navigational Risk Assessment	3	3	3	3	3	2	4	8	6	6	4.5	Most Likely: Low energy low speed collision between small bunker barge and receiving vessel while manoeuvring alongside leading to very minor damage to one or both vessels, no pollution and no injury Worst credible: Medium energy medium speed collision between bunker barge and recieving vessel caused by equipment malfunction leading to damage at or above the waterline and holoed fuel tank needing tier 2 response.
1.2	Contact	Technical Failure Bridge Team Error Environmental Conditions Mooring Failure	Marine Department scheduling POT11L Byelaws POT11L and PLA MOU POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL tug requirements POTLL Mooring manual POTLL Marine Department Emergency plans POTLL OPRC Plan POTLL Tier 2 responders PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation T2 Navigational Risk Assessment	3	3	6	3	3	2	4	6	8	8	5.125	Most Likely: arted mooring line leads to low energy contact with quay during bunkering operations. Bunkers ceased while vessel resecured. No damage. Worst Credible: contact with shoreside infrastructure during bunkering operations due to failed mooring lines, bunker hose disconnected before fuel shut off leading to in dock pollution and tier 2 response.
1.3	Loss of Conrainment (Oil Products)	Technical Failure Human Error Collision Grounding Mooring Failure Sinking Fie/Expolsion Contact	POTLL Marine Department scheduling POT11L Byelaws POT11L and PLA MOU POTLL Ruling Depths POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL Mooring manual POTLL Marine Department Emergency plans POTLL OPRC Plan POTLL Tier 2 responders PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation T2 Navigational Risk Assessment	3	3	6	3	3	2	4	2	8	8	4.625	Most likely: failed fitting on bunker hose resulting in small loss of prdiuct on deck, scuppers closed, on deck clean up only, no pollution in dock. Worst Credible: Due to communication errors hose disconnected imediately before pumping begins. Volume of oil product lost over the side requiring tier 2 response.
1.4	Fire/Explosion	Technical Failure Human Error Collision Grounding Mooring Failure Sinking Fie/Expolsion Contact	POTLL Marine Department scheduling POTLL Bunker procedure and checklist POT11L Byelaws POT11L and PLA MOU POTLL Ruling Depths POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL Mooring manual POTLL Marine Department Emergency plans POTLL OPRC Plan POTLL Tier 2 responders PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation T2 Navigational Risk Assessment	3	3	6	3	3	2	6	8	8	8	5.625	Most likely: small fire on board unconnected to bunkering operation. Fire isolated and dealt with by crew. No dmage, no injuries. Worst credible: fire/explosion caused by malfunctioning equipment leading to injuries on crew on board and loss of oil into dock requiring tier 2 response

FORTH PORTS LIMITED
Risk Assessment

Port of Tilbury Enclosed Dock Marine Pollution

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
				Likelihood	Overall Risk				Likelihood	Overall Risk					
					People	Property	Environment	Business		People	Property	Environment	Business		
1.1	Loss of Containment (oil product)	Collision Contact Grounding Poor Decision Making Technical Failure	POTLL Marine Department scheduling POTLL Bunkering procedure and checklist POTLL Survey and Dredging program POTLL Marine Guidelines and Port information POTLL Marine Department Emergency plans POTLL OPRC POTLL Ruling Depth document POTLL UKC POTLL Tier 2 responder Lock Gates POTLL Berthing Advisors PLA Ship Towage Code of Practice Ship Towage	4	4	4	8	4	1	1	4	4	4	4.125	Most Likely: Small spill on deck during bunker operations, with small amount of product entering the dock, and dealt with by the vessel and port . No injuries, , No disruption to the Port Worst credible: Collision between manouevring vessel and moored vessel punctures a fuel tank resulting in substantial release of fuel into the dock. Tier 2 response required. Substantial disruption to the Port.

FORTH PORTS LIMITED
Risk Assessment

Port of Tilbury - Non Tidal Diving Operations

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
				Likelihood	Overall Risk				Likelihood	Overall Risk					
					People	Property	Environment	Business		People	Property	Environment	Business		
1.1	Swamping / turbulence / interaction	Proximity and/or speed of Passing Traffic	Forth Ports Dive Procedure (Permit) Marine Department scheduling Exclusion Zones Speed Restrictions POTLL Notice to Mariners POTLL Marine Guidelines and Port Information Dive Supervisor Local Monitoring	3	3	3	3	3	2	10	2	2	8	4.25	Most Likely: Diving operations interupted due to wash from passing/manouevring traffic. No damage to equipment, diving ops continue Worst Credible: Severe injury caused to diver due to wash from passing/manouevring traffic. Rescue operation required, disruption to Port
1.2	Contact / Collision	Proximity and/or Speed of Passing Traffic	Forth Ports Dive Procedure (Permit) Established Communications Marine department scheduling Exclusion Zones POTLL Marine Guidelines and Port Information POTLL Notice to Mariners	2	4	4	2	2	1	5	3	2	4	3.25	Most likely: Vessel manourving for berth has a low speed low energy collision with a dive vessel. Minor injury, minor damage to dive vessel, dive operation delayed, no disruption to Port. Worst Credible: Vessel manouevring for berth has a high energy collision with dive vessel. multiple injuries on board dive boat and death of diver, rescue operation, damage to dive boat and disruption to Port.

FORTH PORTS LIMITED
Risk Assessment

Ports of Tilbury and Tilbury 2 - Tidal Diving Operations

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
				Likelihood	Overall Risk				Likelihood	Overall Risk					
					People	Property	Environment	Business		People	Property	Environment	Business		
1.1	Swamping / turbulence / interaction	Proximity and/or speed of Passing Traffic	Forth Ports Dive Procedure (Permit) Marine Department scheduling POTLL Notice to Mariners POTLL Marine Guidelines and Port Information PLA VTS Service PLA byelaws and General Directions PLA Notice to Mariners PIA Dive Permit Pla Pilotage Directions PLA Exclusion Zones PLA Speed Restrictions Bridge Simulation T2 Navigational Risk Assessment Bridge Simulation	3	3	3	3	3	1	4	3	3	5	3.375	Most Likely: Diving operations interupted due to wash from passing/manouevring traffic. No damage to equipment, diving ops continue Worst Credible: Sever injury caused to diver due to wash from passing/manouevring traffic. Rescue oepration requireed, disruption to Port
1.2	Contact / Collision	Proximity and/or Speed of Passing Traffic	Forth Ports Dive Procedure (Permit) Marine department scheduling POTLL Marine Guidelines and Port Information POTLL Notice to Mariners PLA VTS Service PLA Notice to Mariners PLA Diver Permit PLA Pilotage Directions PLA Exclusion Zones PLA Speed Restrictions Bridge Simulation T2 Navigational Risk Assessment	3	3	3	3	3	1	4	4	4	5	3.625	Most likely: Vessel manourving for berth has a low speed low energy collision with a dive vessel. Minor injury, minor damage to dive vessel, dive operation delayed, no disruption to Port. Worst Credible: Vessel manouevring for berth has a high energy collision with dive vessel. multiple injuries on board dive boat and to diver, rescue operation, damage to dive boat and disruption to Port.

FORTH PORTS LIMITED
Risk Assessment

Port of Tilbury - Non tidal Towage Operations

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
				Likelihood	Overall Risk				Likelihood	Overall Risk					
					People	Property	Environment	Business		People	Property	Environment	Business		
1.1	Capsizing / Flooding	Girting Loss of Stability Grounding Technical Failure Human Error Environmental Conditions Tug Positioning Speed	Marine Department Scheduling POTLL Permit to Manouevre POTLL Notice to Mariners POTLL Permanent Notice to Mariners POTLL Emergency Plans POTLL OPRC POTLL Weather Forecasting POTLL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practive Ship Towage POTLL Berthing Advisors	2	2	6	4	4	2	10	10	8	8	6.5	Most Likely: Mechanical failure causes vessels engine room to flood. Bilge pumps are adequate and able to keep vessel afloat until repairs are made. No Injuries, minor damage to the tug, potential delay to vessel berthing/unberthing. Vessel unable to continue towage operations Worst Credible: Vessel causes tug girting, due to sudden movement away from the tug, capsize, pollution, salvage operation on the tug, potential loss of life
1.2	Fire	Loss of Containment Grounding Technical Failure Human Error Environmental Conditions	Marine Department Scheduling POTLL Permit to Manouevre POTLL Notice to Mariners POTLL Permanent Notice to Mariners POTLL Emergency Plans POTLL OPRC POTLL Weather Forecasting POTLL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practive Ship Towage POTLL Berthing Advisors	3	3	3	3	6	2	10	10	2	8	5.625	Most Likely: Small fire due to equipment failure, dealt with by onboard FFE. No injuries, very minor damage, no impact on the Port. Worst Credible: Large engine room fire, cannot be dealt with by on board FFE, major damage to vessel, resulting in deaths, disruption to port services.
1.3	Contact	Technical Failure Loss of Tow / Towline Failure Bridge Team Error Environmental Conditions Change to Shore Infrastructure / Obstruction on the Quay Floating Debris Tug Positioning	Marine Department scheduling POTLL Permit to Manouevre POTLL Notice to Mariners POTLL Permanent Notice to Mariners POTLL Emergency Plans POTLL OPRC POTLL Weather Forecasting POTLL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice Ship Towage POTLL Berthing Advisors	5	5	5	5	5	2	6	10	2	10	6	Most Likely: Light contact made with quay during towage operations. minor damage to tug / quayside, towage operation continues, no disruption to Port. Worst Credible: Tow line parts during towage operation leading to heavy contact with quayside. Damage to tug, significant damage to quayside / lock gates, towage operations aborted, minor disruption to the Port
1.4	Collision	Technical Failure Loss of Tow / Towline Failure Bridge Team Error Environmental Conditions	Marine Department scheduling POTLL Permit to Manouevre POTLL Notice to Mariners POTLL Permanent Notice to Mariners POTLL Emergency Plans POTLL OPRC POTLL Weather Forecasting POTLL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice Ship Towage POTLL Berthing Advisors	3	3	3	3	3	2	6	8	2	8	4.5	Most Likely: Minor collision between tug and towed vessel, superficial damage to one or both vessels. No injuies, towage operation continues, no disruption to the Port. Worst Credible: Tug undertaking towage operations has an impact with another manouevring vessel causing significant damage to one or both vessles, multiple minor or single major injury. Dirsruption to Port,.
	Grounding	Technical Failure Bridge Team Error Environmental Conditions	Marine Department Scheduling Byelaws & General Directions Emergency Plans Weather Forecasting / Tidal Predications Marine Guidelines & Port Information Towage Guidelines Notice to Mariners PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice Ship Towage POTLL Berthing Advisors	2	2	2	2	2	2	2	2	2	6	2.5	Most Likely: tug goes aground manouerving vessel near berth, clears obstruction with engines and continues manouvre. No damage, no injuries, no disruptiopn to the Port. Worst Credible: Tug and deep drafter vessel take to ground during unberthing, cannot rfloat without assistance. No injuries, delays and cancelled arrivals, moderate disruption to the Port
1.5	Man Overboard / Personal Injury	Human Error Technical Failure Enviromental Conditions	POTLL LSA POTLL weather forecasting POTLL Wind parameters POTLL Restricted visibility procedures PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice Ship Towage POTLL Berthing Advisors	2	2	2	2	2	2	10	2	2	8	3.75	Most Likely: Crew member falls overboard is recovered with minor injuries Worst Credible: Crew member falls overboard is not recovered and dies

FORTH PORTS LIMITED
Risk Assessment

Port of Tilbury - Tidal Towage Operations

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
				Likelihood	Overall Risk				Likelihood	Overall Risk					
					People	Property	Environment	Business		People	Property	Environment	Business		
1.1	Capsizing / Flooding	Girting Loss of Stability Grounding Technical Failure Human Error Environmental Conditions Tug Positioning Speed	Marine Department Scheduling POTLL Notice to Mariners POTLL Permanent Notice to Mariners POTLL Mariine Guidelins and Port Information POTLL Emergency Plans POTLL OPRC POTLL Weather Forecasting POTLL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practive PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions Bridge Simulation	3	3	6	3	3	2	8	6	6	8	5.375	Most Likely: Mechanical failure, ie stern gland, causes vessels engine room to flood and a loss of stability. Bilge pumps are adequate and able to keep vessel afloat until repairs are made. Ni injurieds, minor damage o the tug, potential delay to vessel berthing/unberthing Worst Credible: Large deep drafter vessel causes tug girting due to straight line speed inbound for London Container Terminal, tug capsize, tier 1 pollution, salvage operation on the tug, potential loss of life, major disruption to the terminal.
1.2	Fire	Loss of Containment Grounding Technical Failure Human Error Environmental Conditions	Marine Department scheduling POTLL Notice to Mariners POTLL Emergency Plans POTLL OPRC POTLL Weather Forecasting POTLL Marine Guidelines & Port Information PLA Ship Towage Code of Practice PLA Craft Towage Code of Practive PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions Bridge Simulation	3	3	6	3	3	2	6	8	6	8	5.375	Most Likely: Small fire due to quipement failure, dealt with by onboard FFE. No injuries, very minor damage, no impact on the Port. Worst Credible: Large engine room fire on board curuise ship berthed at Tilbury Landing Stage, cannot be dealt with by on board FFE, major damage to vessel, single major injury, disruption to Port.
1.3	Contact	Technical Failure Loss of Tow / Towline Failure Bridge Team Error Environmental Conditions Change to Shore Infrastructure / Obstruction on the Quay Floating Debris Tug Positioning	Marine Department Scheduling POTLL Notice to Mariners POTLL Permanent Notice to Mariners POTLL Mariine Guidelins and Port Information POTLL Emergency Plans POTLL OPRC POTLL Weather Forecasting POTLL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions	4	4	4	4	4	2	4	8	6	8	5.25	Most Likely: Light contact made with quay during towage operations. Minor/superficial damage to tug, no damage to quayside, towage operation continues, no disruption tto Port. Worst Credible: bTow line parts during towage operation leading to heavy contact with quayside. Damage to tug, significant concerte damage to quayside, towgage operations aborrted, minor disruption to the Port
1.4	Collision	Technical Failure Loss of Tow / Towline Failure Bridge Team Error Environmental Conditions	Marine Department Scheduling POTLL Notice to Mariners POTLL Permanent Notice to Mariners POTLL Mariine Guidelins and Port Information POTLL Emergency Plans POTLL OPRC POTLL Weather Forecasting POTLL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions Bridge Simulation	3	3	6	3	3	2	8	8	2	8	5.125	Most Likely: Minor collision between tug and towed vessel, superficial damage to one or both vessels. No injuies, towage operation continues, no disruption to the Port. Worst Credible: Tug undertaking towage operations has a mid/high energy impact with another manouevring vessel causing significant damage to one or both vessles, multiple minor or single major injury. Disruption to Port,.
1.5	Grounding	Technical Failure Bridge Team Error Environmental Conditions	Marine Department Scheduling POTLL Notice to Mariners POTLL Permanent Notice to Mariners POTLL Marine Guidelins and Port Information POTLL Emergency Plans POTLL OPRC POTLL Weather Forecasting POTLL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions Bridge Simulation	3	3	3	3	3	2	2	6	2	8	3.75	Most Likely: tug goes aground manourving vessel near berth, clears obstruction with engines and continues manouvre. No damage, no injuries, no disruptiopn to the Port. Worst Credible: Tug and deep drafter vessel take to ground during unberthing, cannot rfloat without assistance. No injuries, delays and cancelled arrivals, moderate disruption to the Port
1.6	Man Overboard / Personal Injury	Human Error Technical Failure Enviromental Conditions	POTLL LSA POTLL weather forecasting POTLL Wind parameters POTLL Restricted visibility procedures PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions Ship Towage Bridge Simulation	3	3	3	3	3	2	10	2	2	10	4.5	Most Likely: Minor hand injury whilst working lines. Minbor first aid adminsiered on board. No disruption to the Port Worst Credible: Crew member on tug struuck by parted tow line, likely fatality. Severe disruption to the port.

FORTH PORTS LIMITED
Risk Assessment

Port of Tilbury 2 - Tidal Towage Operations

Ref.	Hazard What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Risk scored at Residual level (Most Likely)					Risk scored at Residual level (Worst Credible)					Hazard Risk Score	Most Likely/Worst Credible Scenarios
				Likelihood	Overall Risk				Likelihood	Overall Risk					
					People	Property	Environment	Business		People	Property	Environment	Business		
1.1	Capsizing / Flooding	Girting Loss of Stability Grounding Technical Failure Human Error Environmental Conditions Tug Positioning Speed	MArine Department scheduling POTLL Notice to Mariners POTLL Permanent Notice to Mariners POTLL Marine Department Emergency Plans POTLL Weather Forecasting POTLL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practive PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions Ship Towage Bridge Simulation T2 Navigational Risk Assessment	2	2	4	4	2	1	3	4	4	5	3.5	Most Likely: Mechanical failure, ie stern gland, causes vessels engine room to flood and a loss of stability. Bilge pumps are adequate and able to keep vessel afloat until repairs are made. No injuries, minor damage o the tug, potential delay to vessel berthing/unberthing Worst Credible: Ship causes tug girting due to straight line speed inbound for T2, tug capsize, tier 1 pollution, salvage operation on the tug, potential loss of life, major disruption to the terminal.
1.2	Fire	Loss of Containment Grounding Technical Failure Human Error Environmental Conditions	Marine Department scheduling POTLL Byelaws & General Directions POTLL MArine Department Emergency Plans POTLL OPRC POTLL Weather Forecasting POTLL Marine Guidelines & Port Information POTLL Notice to Mariners PLA Ship Towage Code of Practice PLA Craft Towage Code of Practive PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions Ship Towage	2	2	4	2	2	1	4	4	4	5	3.375	Most Likely: Small fire due to quipement failure, dealt with by onboard FFE. No injuries, very minor damage, no impact on the Port. Worst Credible: Large engine room fire on board curuise ship berthed at Tilbury Landing Stage, cannot be dealt with by on board FFE, major damage to vessel, single major injury, disruption to Port.
1.3	Contact	Technical Failure Loss of Tow / Towline Failure Bridge Team Error Environmental Conditions Change to Shore Infrastructure / Obstruction on the Quay Floating Debris Tug Positioning	Marine Department scheduling Byelaws & General Directions Emergency Plans Weather Forecasting / Tidal Predications Marine Guidelines & Port Information Towage Guidelines Notice to Mariners Tug SMS PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions Ship Towage Bridge Simulation T2 Navigational Risk Assessment	3	3	6	3	3	2	4	8	2	8	4.625	Most Likely: Light contact made with dolphin during towage operations. Minor/superficial damage to tug, no damage to quayside, towage operation continues, no disruption tto Port. Worst Credible: bTow line parts during towage operation leading to heavy contact with quayside. Damage to tug, significant concerte damage to quayside, towgage operations aborrted, minor disruption to the Port
1.4	Collision	Technical Failure Loss of Tow / Towline Failure Bridge Team Error Environmental Conditions	MArine Department scheduling POTLL Emergency Plans POTLL Weather Forecasting POTLL Marine Guidelines & Port Information PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions Bridge Simulation T2 Navigational Risk Assessment	2	2	6	2	2	1	4	5	2	5	3.5	Most Likely: Minor collision between tug and towed vessel, superficial damage to one or both vessels. No injuies, towage operation continues, no disruption to the Port. Worst Credible: Tug undertaking towage operations has a mid/high energy impact with another manouevring vessel causing significant damage to one or both vessles, multiple minor or single major injury. Disription to Port,.
1.5	Grounding	Technical Failure Bridge Team Error Environmental Conditions	Marine Department Scheduling POTLL Emergency Plans POTLL Weather Forecasting POTLL Marine Guidelines & Port Information POTLL Notice to Mariners PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions Ship Towage Bridge Simulation T2 Navigational Risk Assessment	2	2	2	2	2	1	1	4	2	5	2.5	Most Likely: tug goes aground manourving vessel near berth, clears obstruction with engines and continues manouvre. No damage, no injuries, no disruptiopn to the Port. Worst Credible: Tug and deep drafter vessel take to ground during unberthing, cannot rfloat without assistance. No injuries, delays and cancelled arrivals, moderate disruption to the Port
1.6	Man Overboard / Personal Injury	Human Error Technical Failure Enviromental Conditions	POTLL LSA POTLL weather forecasting POTLL Wind parameters POTLL Restricted visibility procedures PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice PLA Pilotage Directions PLA VTS Service PLA Hydrographic surveys PLA Tidal information PLA Notice toi MAriners PLA Byelaws and General Directions Ship Towage Bridge Simulation T2 Navigational Risk Assessment	3	6	6	3	3	1	5	2	2	5	4	Most Likely: Minor hand injury whilst working lines. Minbor first aid adminsiered on board. No disruption to the Port Worst Credible: Crew member on tug struuck by parted tow line, likely fatality. Severe disruption to the port.