

APPENDIX H: SAFETY RISK ASSESSMENT

Navigation Safety Risk Assessment

Id.	Event	Portion of Route	Risk Factors	Likelihood and Consequences			RIN
				Minor	Moderate	Major	
1	Collision (with pilot boat)	Approach to / vicinity of pilot station	Vessel Conditions: <ul style="list-style-type: none"> • Loss of situational awareness while taking pilot on board • Mechanical / system failure while maneuvering to pick up / discharge pilot Traffic Conditions: <ul style="list-style-type: none"> • Other vessel traffic (particularly vicinity of Point Judith / approaches to Narraganset Bay) Navigational Conditions: <ul style="list-style-type: none"> • Reduced visibility in fog • Weather conditions • Time of day (day vs. night) 	3.87	3.07	1.93	1799.70
2	Collision - LNG carrier	Approach to / vicinity of pilot station	Vessel Conditions: <ul style="list-style-type: none"> • Navigation decisions by vsl crew while approaching pilot station • Loss of situational awareness while taking pilot on board • Mechanical / system failure while maneuvering to pick up / discharge pilot Traffic Conditions: <ul style="list-style-type: none"> • Other vessel traffic (commercial and recreational) in area Navigaitonal Conditions: <ul style="list-style-type: none"> • Reduced visibility in fog • Time of day (day vs. night) 	3.00	2.20	2.00	924.43
3	Collision - LNG carrier	Block Island Sound	Traffic Conditions: <ul style="list-style-type: none"> • Crossing ferry routes • Meeting large commercial vessels transiting Block Island Sound • Crossing routes commonly used by recreational vessels • Large number of commercial lobster boats and draggers working off the Rhode Island coast Navigational Conditions: <ul style="list-style-type: none"> • Reduced visibility in fog • Time of day (day vs. night) • Time of year Vessel Conditions: <ul style="list-style-type: none"> • Mechanical / system failure when in vicinity other vessels • Navigational decisions 	3.07	3.00	2.27	6586.25

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4	Collision - LNG carrier	The Race	Waterway Conditions: <ul style="list-style-type: none"> • Relatively narrow channel Traffic Conditions: <ul style="list-style-type: none"> • Vessel congestion - commercial and recreational fishing activity • Vessel congestion - meeting other vessels (recreational and commercial) transiting • Vessel congestion - sailing regattas • State of tide - different users time activities (through transits, working gear, etc.) around tide Navigational Conditions: <ul style="list-style-type: none"> • Reduced visibility in fog • Weather conditions • Current • Time of day (day vs. night) • Time of year Vessel Conditions: <ul style="list-style-type: none"> • Loss of situational awareness • Mechanical / system failure 	3.47	3.20	2.33	11274.61
5	Collision (small craft at edge of shipping lane)	The Race	Waterway Conditions: <ul style="list-style-type: none"> • Relatively narrow channel Navigational Conditions: <ul style="list-style-type: none"> • Current • Reduced visibility in fog • Time of day (day vs. night) • Weather conditions Traffic Conditions: <ul style="list-style-type: none"> • Concentrations of smaller vessels at edge of shipping lane • Time of year Vessel Conditions: <ul style="list-style-type: none"> • Recreational vessel operator losses situation awareness while clearing channel in advance of LNG carrier transit • Lack of recreational vessel operator training • Mechanical / system failure 	3.73	3.07	2.20	4816.07

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6	Collision - LNG carrier	Eastern Long Island Sound	Traffic Conditions: <ul style="list-style-type: none"> • Vessel congestion - recreational and commercial vessels queuing to transit The Race after LNG carrier transit or pushing to transit prior to LNG carrier passage • Crossing ferry routes, meeting large commercial vessels transiting Sound • Heavy concentration of smaller commercial and recreational vessels • Vessel traffic transiting Plum Gut • Time of year Navigational Conditions: <ul style="list-style-type: none"> • Reduced visibility in fog • Heavy current Vessel Conditions: <ul style="list-style-type: none"> • Navigational decisions • Loss of situational awareness • Mechanical / system failure 	3.67	3.00	2.13	3168.04
7	Collision - LNG carrier	Central Long Island Sound	Vessel Conditions: <ul style="list-style-type: none"> • Loss of situational awareness meeting large commercial vessels transiting Sound • Mechanical / system failure when in vicinity other vessels • Navigational decisions Navigational Conditions: <ul style="list-style-type: none"> • Reduced visibility in fog Traffic Conditions: <ul style="list-style-type: none"> • Vessel congestion 	2.93	2.13	1.20	21.01
8	Collision - non-LNG carriers	Vicinity of FSRU	Traffic Conditions/Waterway Conditions: <ul style="list-style-type: none"> • Proposed location is in an area of open water that historically has been transited by tankers headed to Northport and tug/tows transiting east/west through the Sound • Proximity of east/west transit routes to FSRU • FSRU creates a 'blind spot' - obstructs visibility Navigational Conditions: <ul style="list-style-type: none"> • Reduced visibility in fog • Weather conditions Vessel Conditions: <ul style="list-style-type: none"> • Loss of situational awareness while LNG carrier maneuvering to approach FSRU • Mechanical / system failure while maneuvering 	2.87	2.20	1.93	591.72

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9	Collision - LNG carrier	Western Long Island Sound	<ul style="list-style-type: none"> LNG carriers not expected to transit this area 	0.93	0.93	0.93	0.64
10	Allision - LNG carrier (with ATON)	Approach to / vicinity of pilot station	Vessel Conditions: <ul style="list-style-type: none"> Mechanical / system failure Navigational decisions Loss of situational awareness 	1.00	1.00	1.00	1.00
11	Allision - LNG carrier (with ATON)	Block Island Sound	Vessel Conditions: <ul style="list-style-type: none"> Mechanical / system failure Navigational decisions Loss of situational awareness 	1.00	1.00	1.00	1.00
12	Allision - LNG carrier (with ATON)	The Race	Waterway Conditions: <ul style="list-style-type: none"> Relatively narrow channel Traffic Conditions: <ul style="list-style-type: none"> Vessel congestion - fishing activity Vessel congestion - vessels transiting Navigational Conditions: <ul style="list-style-type: none"> Reduced visibility in fog Vessel Conditions: <ul style="list-style-type: none"> Loss of situational awareness Mechanical / system failure 	1.87	1.27	1.07	1.80
13	Allision - LNG carrier (with ATON)	Eastern Long Island Sound	Traffic Conditions: <ul style="list-style-type: none"> Vessel congestion Crossing ferry routes Vessel Conditions: <ul style="list-style-type: none"> Navigational decisions Loss of situational awareness Mechanical / system failure 	1.00	1.00	1.00	1.00
14	Allision - LNG carrier (with ATON)	Central Long Island Sound	Traffic Conditions: <ul style="list-style-type: none"> Vessel congestion Crossing ferry routes Vessel Conditions: <ul style="list-style-type: none"> Navigational decisions Loss of situational awareness Mechanical / system failure 	1.00	1.00	1.00	1.00
15	Allision with FSRU by non-LNG carriers transiting in vicinity of FSRU	Waters adjacent to FSRU	Traffic Conditions / Waterway Conditions: <ul style="list-style-type: none"> Proposed location is in an area of open water that historically has been transited by tankers headed to Northport and tug/tows transiting east/west through the Sound Navigational Conditions: <ul style="list-style-type: none"> Reduced visibility in fog Time of day - background lighting on FSRU obstructing navigation lights on vessels Vessel Conditions: <ul style="list-style-type: none"> Loss of situational awareness by other vessels transiting in vicinity of FSRU 	2.93	2.33	2.20	3629.14

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16	Allision with FSRU by LNG carriers while mooring or getting underway	Waters adjacent to FSRU	Vessel Conditions: • Mechanical / system failure • Decisions by mooring master, pilot, tug master	3.83	2.07	1.13	20.65
17	Allision (with ATON)	Western Long Island Sound	• LNG carriers not expected to transit this area	0.93	0.93	0.93	0.64
18	Grounding - LNG carrier	Approach to / vicinity of pilot station	Traffic Conditions: • Other vessel traffic (particularly vicinity of Point Judith / approaches to Narraganset Bay) Vessel Conditions: • Navigation decisions by vessel crew while approaching pilot station • Loss of situational awareness while taking pilot on board • Mechanical / system failure while maneuvering to embark/disembark pilot	1.87	1.00	1.00	1.06
19	Grounding - LNG carrier	Block Island Sound	Vessel Conditions: • Mechanical / system failure when in vicinity shoal water • Navigational decisions • Loss of situational awareness	2.00	1.87	1.00	5.87
20	Grounding - LNG carrier	The Race	Waterway Conditions: • Relatively narrow channel • Bathymetry in The Race Navigational Conditions: • Currents • Reduced visibility in fog Traffic Conditions: • Vessel congestion - commercial and recreational fishing activity • Vessel congestion - vessels transiting Vessel Conditions: • Loss of situational awareness • Mechanical / system failure in vicinity of shoal water	3.00	2.93	1.87	1022.30
21	Grounding - LNG carrier	Eastern Long Island Sound	Traffic Conditions: • Vessel congestion • Crossing ferry routes Vessel Conditions: • Navigational decisions • Mechanical / system failure in vicinity of shoal water	2.00	1.93	1.00	7.62
22	Grounding - LNG carrier	Central Long Island Sound	Vessel Conditions: • Navigation decision • Loss of situational awareness • Mechanical / system failure in vicinity of shoal water	1.93	1.87	1.00	5.85
23	Grounding - LNG carrier	Vicinity of FSRU	• N/A	0.00	0.00	0.00	0.00
24	Grounding - LNG carrier	Western Long Island Sound	• LNG carriers not expected to transit this area	0.87	0.87	0.87	0.41

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25	Mooring tower failure / FSRU set adrift	Vicinity of FSRU	Navigational Conditions: • Heavy weather • Pack ice / ice floes Waterway Conditions: • Seismic event Non-PAWSA Specific: • Material fatigue / failure Traffic Conditions / Waterway Conditions: • Allision with FSRU	2.33	2.13	2.13	2279.80