

## Vattenfall Wind Power Ltd Thanet Extension Offshore Wind Farm

Annex F Appendix 28 to Deadline 5 Submission: Revised NRA Addendum Hazard Logs

Relevant Examination Deadline: 5

Submitted by Vattenfall Wind Power Ltd

Date: April 2019

Revision B

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Approved By:	Daniel Bates
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Revision:	В

Revision A	Original document submitted to the Examining Authority
Revision B	Revised document submitted to the Examining Authority

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								N	Aost Like	ely Haza	ard Occur	ence		Worst Cred	dible Haz	ard Occu	rrence	
						Conseque	nces	Consec	quence		Likeli 1 in		Cons	sequence		Likelii 1 in :		
Hazard ID	Vessel Type	Hazard Detail	Possible Causes	Y/N	Туре	Most Likely Outcome	Worst Credible Outcome	People	Property Environment	Stakeholders	Baseline Risk	Residual Risk	People	Property Environment	Stakeholders	Baseline Risk	Residual Risk	Notes
1	Class 1 or 2 vessels	Collision Class 1 or 2 vessel with another navigating vessel	Adverse Environmental Conditions     Avoiding Other traffic     Constriction of Shipping Routes     Equipment or Mechanical Failure     Human Error     Increased Traffic Density	Yes Yes Yes Yes Yes Yes	Narrative People	Glancing Blow  Minor-Single minor injury	Fire / Sinking / Foundering  Loss Cargo  Loss of life  Large vessel / Tanker / Dangerous Goods  Major-Multiple major injuries or single fatality	2	2 2	2	36 1	8 25	4	5 5	5	450 22	5 307	Workshop attendees thought collision of Class 1 or 2 vessel was likely to occur twice as often with TEOW in place and no risk controls in place. The inherent likelihood value was therefore increased by 50%.  IP Review: Consequence scores for ML Environment and Stakeholder Category increased based on PLA / ESL / DPWLG Request
			8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues	No Yes Yes	Property Environment Stakeholders	Minor damage-Costs £10k -£100k  Negligible-Very Small Spill  Negligible-No significant effects	Catastrophic damage-Costs >£10M  Catastrophic-Tier 3+  Major-National adverse media publicity and/or medium-term loss of revenue											
2	Class 3 or 4 Vessels	Collision Class 3 or 4 vessel with another navigating vessel	1 - Adverse Environmental Conditions     2 - Avoiding Other traffic     3 - Constriction of Shipping Routes     4 - Equipment or Mechanical Failure     5 - Human Error     6 - Increased Traffic Density     7 - Loss of UKC     8 - Low Manoeuvrability of Vessels     9 - Pilot Transfer Issues	Yes Yes Yes Yes Yes Yes Yes Yes Yes No Yes Yes	People Property Environment Stakeholders	Minor-Single minor injury Minor damage-Costs £10k -£100k Negligible-Very Small Spill Negligible-No significant effects	Fire / Sinking / Foundering Loss Cargo Loss of life Vessel / Tanker / Dangerous Goods  Major-Multiple major injuries or single fatality Catastrophic damage-Costs >£10M Catastrophic-Tier 3+ Major-National adverse media publicity and/or medium-term loss of revenue	2	2 2	2	27 1	8 21	4	5 5	4	360 24	0 284	With TEOW in constructed and no risk controls in place the workshop attendees thought that the increase in likelihood of collision for a Class 3 or 4 vessels was not a great as for the Class 1 or 2 vessel, and they would have more sea room following construction of the TEOW (as can pass inshore of NE Racon buoy). With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by 33%.
3	Vessel less than 90m	Collision vessel less than 90m with another navigating vessel	1 - Adverse Environmental Conditions 2 - Avoiding Other traffic 3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure 5 - Human Error 6 - Increased Traffic Density 7 - Loss of UKC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues	Yes Yes Yes Yes Yes Yes Yes Yes No Yes No	People Property Environment Stakeholders	Glancing Blow  Vessels do not need to slow for Pilot Transfer  Minor-Single minor injury  Minor damage-Costs £10k –£100k  Negligible-Very Small Spill  Negligible-No significant effects	Fire / Sinking / Foundering  Loss Cargo  Loss of life  Cargo / Bunker Barge  Major-Multiple major injuries or single fatality  Catastrophic damage-Costs >£10M  Major-Tier 3  Major-National adverse media publicity and/or medium-term loss of revenue	2	2 1	1	27 1	8 21	4	5 4	4	401 26	7 316	Workshop attendees thought collision of a vessel less than 90m a similar change as with Class 3 or 4 vessels with the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by 33%.
4	Fishing or Recreational	Collision Fishing Vessel or recreational craft with another navigating vessel	1 - Adverse Environmental Conditions 2 - Avoiding Other traffic 3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure 5 - Human Error 6 - Increased Traffic Density 7 - Loss of UKC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues	Yes Yes Yes Yes Yes Yes Yes Yes No No	Narrative  People Property Environment Stakeholders	Small vessels colliding Glancing Blow / Loss of gear Lighting of WTG - displace fishing vessels Mostly - potting / netting (less likely trawling) (LOA 8-10m) Wake / Wash Impacts Minor-Single minor injury Minor damage-Costs £10k -£100k Negligible-Very Small Spill Minor-Bad local publicity and/or possible short-term loss of revenue	Collides with larger vessel (WSV, Cargo, etc.)  Crossing / Head on Collision  Sinking / Foundering / Capsize  * assumes lights as per Kentish Flats  Catastrophic-Multiple fatalities  Moderate damage-Costs £100k -£1M  Minor-Tier 1  Major-National adverse media publicity and/or medium-term loss of revenue	2	2 1	2	10	3 9	5	3 2	4	500 40	0 435	Agreement on likelihood of WC outcome was not reached at the workshop. A review of literature published by the Marine Accident Investigation Branch - Analysis of UK Fishing Vessel Safety 1992 to 2006, shows that for fishing vessels under 12m vessels (typical of those operating in the study area) there were 10 collision/contacts between 1992-2006 that results in vessel loss. The UK under 12m fishing fleet at 2006 was 6119, and therefore the likelihood of vessel loss (note that most vessels lost did not result in multiple fatalities) was 10 losses for 6119 vessels over 14 years. This gives an incident rate for loss of a fishing vessel from collision/contact of 1 in 12,238 per vessel years. The fleet operating in the study area is around 10 vessels, who also operate in other areas, and as such based on national incidents, it would be expected that the area would have a WC likelihood value at most 1 in 2000 years. Based on the complexity of traffic profile this could be increased to 1 in 1000 years, and when added to recreational craft incidents which show a similar return rate, then a conservative estimate would be around 1 in 500 year likelihood for the WC assessment.  Based on continued navigation (and fishing) of fishing vessels and recreational craft through the windfarm then the workshop agreed that an increase in likelihood for the linherent assessment would be expected of around 20%.
5	WSV	working or transiting to from Thanet or	1 - Adverse Environmental Conditions 2 - Avoiding Other traffic 3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure 5 - Human Error 6 - Increased Traffic Density 7 - Loss of UKC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues	Yes Yes Yes Yes Yes Yes No No No	Narrative  People Property Environment Stakeholders	Collides with small vessel at low speed Glancing blow  Minor-Single minor injury Minor damage-Costs £10k -£100k  Negligible-Very Small Spill Minor-Bad local publicity and/or possible short-term loss of revenue	Collides at speed with other vessel  Crossing / Head on Collision  Sinking / Foundering / Capsize  Catastrophic-Multiple fatalities  Major damage -Costs £1M - £10M  Minor-Tier 1  Major-National adverse media publicity and/or medium-term loss of revenue	_ 2	2 1	2	50 4	D 44	5	4 2	4 1	1000 80	0 871	With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by 20%.  PLA request to increase ML Consequence to People category not taken forward as People consequences for ML likely to be similar to other vessel types such as pilot boats (which weren't increased by PLA). Also recent incident at Wikinger OWF - Germany shows WC WSV collision likely to be moderate injuries, therefore not considered a most likely occurrence.
6	Pilot Launch	Collision Pilot Launch with another navigating vessel	10 - 1 - Adverse Environmental Conditions 2 - Avoiding Other traffic 3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure 5 - Human Error 6 - Increased Traffic Density 7 - Loss of UKC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues 10 -	INO	People Property Environment Stakeholders	Slow Speed collision Glancing Blow Minimal damage Minor-Single minor injury Minor damage-Costs £10k –£100k Negligible-Very Small Spill Minor-Bad local publicity and/or possible short-term loss of revenue	High speed collision  Crossing / Head on Collision  Significant damage  Major-Multiple major injuries or single fatality  Major damage - Costs £1M - £10M  Minor-Tier 1  Major-National adverse media publicity and/or medium-term loss of revenue	2	2 1	2	50 4	0 45	4	4 2	4 1	1000 80	0 904	With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by 20%.

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								Мо	ost Likely	y Hazard	Occurren	nce	Wo	orst Credib	ole Hazar	d Occurr	ence	
						Conseque	nces	Consequ	ience		Likeliho		Conseq	uence		Likeliho		
Hazard IC Category	Vessel Type	Hazard Detail	Possible Causes	Y/N		Most Likely Outcome	Worst Credible Outcome	People Property	Environment	Stakeholders Baseline Risk	Inherent Risk	Residual Risk	People	Property	Stakeholders Baseline Risk	Inherent Risk	Residual Risk	Notes
			1 - Adverse Environmental Conditions 2 - Avoiding Other traffic	Yes Yes	Narrative	Glancing Blow	Fire / Sinking / Foundering Loss Cargo											
			Constriction of Shipping Routes     Guipment or Mechanical Failure	Yes			Loss of life  Large vessel / Tanker / Dangerous Goods	+					Ш					
act	Class 1 or 2	Class 1 or 2 Vessel comes into contact	5 - Human Error	Yes			Large vesser/ ranker/ Dangerous Goods	1										With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by 50% which is the same increase in likelihood as applied to Haz # 1: Collision Class 1 or 2 vessels.
Cont	Vessels	with a WTG or other structure	6 - Increased Traffic Density	Yes	People	Minor-Single minor injury	Major-Multiple major injuries or single fatality	2 2	1	3 45	5 23	30	4	4 4	4   48	5 243	329	IP Review: Consequence scores for ML Stakeholder Category increased based on PLA / ESL / DPWLG request
			7 - Loss of UKC		Property	Minor damage-Costs £10k –£100k	Major damage -Costs £1M - £10M	4										
			8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues		Environment Stakeholders	Negligible-Very Small Spill  Minor-Bad local publicity and/or possible short-term loss of revenue	Major-Tier 3  Major-National adverse media publicity and/or medium-term loss of revenue	+										
			10 -	163	Stakenolders	winor bad local publicity analysis possible short term loss of revenue	major reaconal adverse media publicity anayor mediam cerimoss or revenue	1										
			1 - Adverse Environmental Conditions	Yes	Narrative	Glancing Blow	Fire / Sinking / Foundering											
			2 - Avoiding Other traffic	Yes			Loss Cargo											
			3 - Constriction of Shipping Routes	Yes			Loss of life	-					ш					
t	Class 3 or 4	Class 3 or 4 Vessel	4 - Equipment or Mechanical Failure 5 - Human Error	Yes			Large vessel / Tanker / Dangerous Goods	-					ш					With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by
Conta	Vessels	with a WTG or other	6 - Increased Traffic Density		People	Minor-Single minor injury	Major-Multiple major injuries or single fatality	2 2	1	3 41	1 27	31	4	4 4	4 45:	301	346	33% which is the same increase in likelihood as applied to Haz # 2: Collision Class 3 or 4 vessels.  IP Review: Consequence scores for ML Stakeholder Category increased based on PLA / ESL / DPWLG request.
		structure	7 - Loss of UKC	No	Property	Minor damage-Costs £10k –£100k	Major damage -Costs £1M - £10M						ш					
			8 - Low Manoeuvrability of Vessels		Environment	Negligible-Very Small Spill	Major-Tier 3						ш					
			9 - Pilot Transfer Issues	Yes	Stakeholders	Negligible-No significant effects	Major-National adverse media publicity and/or medium-term loss of revenue	-					ш					
			1 - Adverse Environmental Conditions	Yes	Narrative	Slow Speed contact	High speed contact	+	+				Н					
			2 - Avoiding Other traffic	Yes		Glancing blow	Significant damage	1					ш					
			3 - Constriction of Shipping Routes	Yes		Minimal damage							ш					
			4 - Equipment or Mechanical Failure	Yes									ш					
o ontact	Vessel less than 90m	less than 90m comes into contact with a		Yes				2 2	1	2 45	5 30	35	4	4 4	4 90	600	690	With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by 33% which is the same increase in likelihood as applied to Haz # 3: Collision less than 90m length.
ŭ	than 50m	WTG or other structure	6 - Increased Traffic Density		People Property	Minor-Single minor injury  Minor damage-Costs £10k –£100k	Major-Multiple major injuries or single fatality  Major damage -Costs £1M - £10M	-					ш					33% which is the same melease in inclinious as applied to 102 # 3, consisting as dian 30th length.
			8 - Low Manoeuvrability of Vessels		Environment	Negligible-Very Small Spill	Major-Tier 3	1					ш					
			9 - Pilot Transfer Issues	No	Stakeholders	Negligible-No significant effects	Major-National adverse media publicity and/or medium-term loss of revenue											
			10 -										ш					
			1 - Adverse Environmental Conditions		Narrative	Slow Speed contact	High speed contact	4					ш					
			2 - Avoiding Other traffic 3 - Constriction of Shipping Routes	Yes		Glancing blow Minimal damage	Significant damage	-					ш					
			4 - Equipment or Mechanical Failure	Yes		The second secon		1					ш					
tact 10	WSV	WSV comes into contact with a WTG	5 - Human Error	Yes				١,,		2 50	0 40	42		4 2	4 100	0 000	950	With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by
5	WSV	or other structure	6 - Increased Traffic Density	Yes	People	Minor-Single minor injury	Major-Multiple major injuries or single fatality	]	1	2 30	40	42		4   2	4 100	0 800	830	20%.
			7 - Loss of UKC		Property	Minor damage-Costs £10k –£100k	Major damage -Costs £1M - £10M	4					ш					
			8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues		Environment Stakeholders	Negligible-Very Small Spill  Minor-Bad local publicity and/or possible short-term loss of revenue	Minor-Tier 1 Major-National adverse media publicity and/or medium-term loss of revenue	+					ш					
			10 -				, and the second	1										
			1 - Adverse Environmental Conditions	Yes	Narrative	Slow Speed contact	High speed contact		$\sqcap$				П	$\top$				
			2 - Avoiding Other traffic	Yes		Glancing blow	Significant damage	4										
			3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure	Yes		Minimal damage		1										
ict	Fishing or		4 - Equipment or Mechanical Failure 5 - Human Error	Yes				1										With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by 20%.
	Recreational	Narrative	6 - Increased Traffic Density		People	Minor-Single minor injury	Major-Multiple major injuries or single fatality	2 2	1	2 20	0 16	17	4	3 2	3 50	400	420	IP Review: Consequence scores for ML Stakeholder Category was not increased based on PLA / ESL request as fishing vessel contact with turbines has "anecdotally occurred", but no detailed reports are available and therefore consequences
			7 - Loss of UKC	No	Property	Minor damage-Costs £10k –£100k	Major damage -Costs £1M - £10M	]										to Stakeholders must necessarily have been minimal.
			8 - Low Manoeuvrability of Vessels		Environment	Negligible-Very Small Spill	Minor-Tier 1											
			9 - Pilot Transfer Issues	No	Stakeholders	Negligible-No significant effects	Major-National adverse media publicity and/or medium-term loss of revenue											
			1 - Adverse Environmental Conditions	Yes	Narrative	Slow Speed contact	High speed contact	+	++				$\vdash$	++				
			2 - Avoiding Other traffic	Yes		Glancing blow	Significant damage	1										
			3 - Constriction of Shipping Routes	Yes		Minimal damage		]										
		Pilot Launch comes	4 - Equipment or Mechanical Failure	Yes				1										With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by
12 outact	Pilot Launch	into contact with a WTG or other		Yes	Doon!	Miner Cinele miner interes	Malor Multiple major injurice or significant	2 2	1	2 50	0 40	42	4	3 2	3 100	0 800	841	20%.  IP Review: Consequence scores for ML Stakeholder Category was not increased based on PLA / ESL request as pilot launch
		structure	6 - Increased Traffic Density 7 - Loss of UKC		People Property	Minor-Single minor injury  Minor damage-Costs £10k –£100k	Major-Multiple major injuries or single fatality  Major damage -Costs £1M - £10M	+										vessel contact with turbines would no t likely reach "Bad widespread publicity and/or short-term loss of revenue" as standby pilot vessels area available if a vessel need minor repair work.
			8 - Low Manoeuvrability of Vessels		Environment	Negligible-Very Small Spill	Minor-Tier 1											
			9 - Pilot Transfer Issues	-	Stakeholders	Negligible-No significant effects	Major-National adverse media publicity and/or medium-term loss of revenue	1										
			10 -															

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Hazard ID Category								Mo	ost Likely	/ Hazard	Occurren	ice	Wo	rst Credib	le Hazard	Occurre	ence	
Hazard IL Category						Conseque	nces	Consequ	uence		Likelihoo 1 in x y		Consequ	uence		Likelihoo 1 in x yı		
	Vessel Type	Hazard Detail	Possible Causes	Y/N	Туре	Most Likely Outcome	Worst Credible Outcome	People Property	Environment	Stakeholders Baseline Risk	Inherent Risk	Residual Risk	People	Environment	Stakeholders Baseline Risk	Inherent Risk	Residual Risk	Notes
		Displacement or constriction of	1 - Adverse Environmental Conditions     2 - Avoiding Other traffic     3 - Constriction of Shipping Routes     4 - Equipment or Mechanical Failure	Yes Yes Yes Yes	Narrative	Slow Speed grounding  Re-float on the same tide	Vessel unable to re-float on same tide / assistance required Fire / Sinking / Foundering Loss Cargo Loss of life											With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by
13 la lu	Class 1 or 2 Vessels	along cable route results in a Class 1 or 2 vessel running	5 - Human Error 6 - Increased Traffic Density 7 - Loss of UKC 8 - Low Manoeuvrability of Vessels	Yes	People Property Environment	Minor-Single minor injury Minor damage-Costs £10k –£100k Minor-Tier 1	Large vessel / Tanker / Dangerous Goods Major-Multiple major injuries or single fatality Catastrophic damage-Costs >£10M Catastrophic-Tier 3+	2 2	2	2 72	2 48	57	3 4	1 4	5 900	600	710	33.33%.  IP Review: Consequence scores for ML Environment Category increased by one level based on PLA / ESL review.  Consequence scores for WC Environment scores was increased by 1 level based on PLA / ESL review (noting that PLA / ESL view requested it be increased by 2 levels - however due to the sea bed type in the vicinity of North East Spit (most likely area for grounding) the WC environmental consequences are not anticipated to be catastrophic).
			9 - Pilot Transfer Issues 10 - 1 - Adverse Environmental Conditions 2 - Avoiding Other traffic	Yes Yes	Stakeholders  Narrative	Minor-Bad local publicity and/or possible short-term loss of revenue  Slow speed grounding  Vessel touches bottom	Major-National adverse media publicity and/or medium-term loss of revenue  Higher speed Grounding  Vessel firmly aground											
14 Bunding	Class 3 or 4 Vessels	shipping routes and the loss of depth along cable route results in a Class 3 or	3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure 5 - Human Error 6 - Increased Traffic Density 7 - Loss of UKC	Yes Yes Yes Yes Yes	People Property	Vessel re-floats on same tide  Minor-Single minor injury  Minor damage-Costs £10k -£100k	Vessel is not re-floated on same tide  Major-Multiple major injuries or single fatality  Catastrophic damage-Costs >£10M	2 2	2	2 54	4 41	45	3 4	1 4	5 720	540	606	With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by 25%.  IP Review: Consequence scores for ML Environment a Category increased by one level based on PLA / ESL review.  Consequence scores for WC Environment scores was increased by 1 level based on PLA / ESL review.
		aground.	8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues 10 - 1 - Adverse Environmental Conditions	Yes Yes	Environment Stakeholders Narrative	Minor-Tier 1  Minor-Bad local publicity and/or possible short-term loss of revenue  Slow speed grounding	Catastrophic-Tier 3+  Major-National adverse media publicity and/or medium-term loss of revenue  Higher speed Grounding											
guipu 15	Vessel less	constriction of shipping routes and	2 - Avoiding Other traffic     3 - Constriction of Shipping Routes     4 - Equipment or Mechanical Failure     5 - Human Error	Yes Yes Yes Yes		Vessel touches bottom  Vessel re-floats on same tide	Vessel is not re-floated on same tide		2	2 54	4 43	47	3 4	1 3	4 450	360	303	With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by 20%.
Grou	than 90m	along cable route results in a vessel less than 90m running aground.	6 - Increased Traffic Density 7 - Loss of UKC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues	Yes Yes		Minor-Single minor injury  Minor damage-Costs £10k -£100k  Minor-Tier 1  Minor-Bad local publicity and/or possible short-term loss of revenue	Major-Multiple major injuries or single fatality  Catastrophic damage-Costs >£10M  Catastrophic-Tier 3+  Major-National adverse media publicity and/or medium-term loss of revenue									330	333	IP Review: Consequence scores for ML Environment Category increased by one level based on PLA / ESL review.
		constriction of	Adverse Environmental Conditions     Avoiding Other traffic     Constriction of Shipping Routes     Equipment or Mechanical Failure	Yes Yes Yes Yes	Narrative	Slow speed grounding Vessel touches bottom Vessel re-floats on same tide	Higher speed Grounding  Vessel firmly aground  Vessel is not re-floated on same tide	<u>                                     </u>										
	Fishing or Recreational	the loss of depth along cable route results in a Fishing vessel or recreational vessel running	5 - Human Error 6 - Increased Traffic Density 2 - Loss of UKC 8 - Low Manoeuvrability of Vessels	Yes Yes No	People Property Environment	Minor-Single minor injury  Negligible-Costs <£10k  Negligible-Very Small Spill	Major-Multiple major injuries or single fatality  Moderate damage-Costs £100k -£1M  Minor-Tier 1	2 1	1	2 25	5 23	24	4 3	3 2	3 1250	1125	1180	With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by 10%.
			9 - Pilot Transfer Issues 10 - 1 - Adverse Environmental Conditions 2 - Avoiding Other traffic	No Yes Yes	Stakeholders Narrative	Minor-Bad local publicity and/or possible short-term loss of revenue  Slow speed grounding  Vessel touches bottom	Moderate-Bad widespread publicity and/or short-term loss of revenue  Higher speed Grounding  Vessel firmly aground											
17 Brounding	WSV	constriction of shipping routes and	3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure 5 - Human Error 6 - Increased Traffic Density	Yes Yes Yes Yes No	People Property	Vessel re-floats on same tide  Minor-Single minor injury  Minor damage-Costs £10k -£100k	Vessel is not re-floated on same tide  Major-Multiple major injuries or single fatality  Moderate damage-Costs £100k -£1M	2 2	1	2 25	5 23	24	4 3	3 2	4 1250	1125	1180	With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by 10%.
		vessel running aground.	8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues 10 - 1 - Adverse Environmental Conditions	Yes	Environment Stakeholders Narrative	Negligible-Very Small Spill  Minor-Bad local publicity and/or possible short-term loss of revenue  Slow speed grounding	Minor-Tier 1  Major-National adverse media publicity and/or medium-term loss of revenue  Higher speed Grounding											
18 L1	Pilot Launch	constriction of shipping routes and the loss of depth	2 - Avoiding Other traffic 3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure 5 - Human Error	Yes Yes Yes Yes		Vessel touches bottom  Vessel re-floats on same tide	Vessel firmly aground Vessel is not re-floated on same tide		1	2 40	0 36	38	4   3	3 2	4 2000	1800	1889	With the TEOW constructed and no additional risk controls in place the inherent likelihood return rate was increased by
Groun	. not caultil	along cable route results in a Pilot Launch running aground.	6 - Increased Traffic Density 2 - Loss of UKC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues	No Yes	People Property Environment Stakeholders	Minor-Single minor injury  Minor damage-Costs £10k –£100k  Negligible-Very Small Spill  Minor-Bad local publicity and/or possible short-term loss of revenue	Major-Multiple major injuries or single fatality  Moderate damage-Costs £100k -£1M  Minor-Tier 1  Moderate-Bad widespread publicity and/or short-term loss of revenue			_ 40	30	30			. 2000	1000	2009	10%.

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					Consequent	annes			Baseline R	Risk				Inherent R	tisk			Resid	ual Risk				
					Conseque	ences	м	lost Likely Risk	k	Worst Cre	edible Risk		Most Likely R	isk	Worst Credib	ole Risk	Most Lik	cely Risk	Wors	: Credible Risl	k		
Vessel Type	pe H	Hazard Detail	Possible Causes	Y/N	Type Most Likely Outcome	Worst Credible Outcome	People	Property Environment	Stake holders	People Property	Environment Stakeholders	People	Property Environment	Stakeholders	Property	Environment Stake holders	People Property	Environment Stakeholders	People	Froperty	Stakeholders	Inherent Risk	Additional Risk Controls 전 교 명한
			- Adverse Environmental Conditions     - Avoiding Other traffic	Yes Yes	Narrative Glancing Blow	Fire / Sinking / Foundering Loss Cargo																	Enhanced Promulgation of Information (already adopted by the Applicant)     Shipping and Navigation Liaison Group (already adopted by the Applicant)
		-	3 - Constriction of Shipping Routes	Yes	<del>                                     </del>	Loss of life																	Post Consent Monitoring for Operational Phase (requested by Trinity House)
Class 1 or 2		lision Class 1 or 2	4 - Equipment or Mechanical Failure 5 - Human Error	Yes		Large vessel / Tanker / Dangerous Goods	$+\Box$																4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)  5. Aids to Navigation / Buoyage (already adopted by the Applicant)
vessels	A6226	sel with another avigating vessel	6 - Increased Traffic Density	Yes	People Minor-Single minor injury	Major-Multiple major injuries or single fatality	2.81	2.81 2.81	2.81 5.	6.26	6.26 6.2	6 3.15	3.15 3.15	3.15 5.	51 6.59 6	.59 6.59	2.99 2.99	2.99 2.99	5.36 6	44 6.44	6.44 4	47 4.80	4.65
			7 - Loss of UKC	No	Property Minor damage-Costs £10k –£100k	Catastrophic damage-Costs >£10M																	
			8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues	Yes	Environment Negligible-Very Small Spill  Stakeholders Negligible-No significant effects	Catastrophic-Tier 3+  Major-National adverse media publicity and/or medium-term loss of revenue																	
		-	10 -																				
			1 - Adverse Environmental Conditions	Yes	Narrative Glancing Blow	Fire / Sinking / Foundering																	Enhanced Promulgation of Information (already adopted by the Applicant)
		-	2 - Avoiding Other traffic 3 - Constriction of Shipping Routes	Yes	<u> </u>	Loss Cargo Loss of life	+																Shipping and Navigation Liaison Group (already adopted by the Applicant)     Post Consent Monitoring for Operational Phase (requested by Trinity House)
			4 - Equipment or Mechanical Failure	Yes		Vessel / Tanker / Dangerous Goods	$\exists$																Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)
Class 3 or 4	4 vocce	lision Class 3 or 4	5 - Human Error	Yes			2.94	2.94 2.94	2.94 5.3	5.28 6.37	6.37 5.2	8 3.15	3.15 3.15	3.15 5.	47 6.55 6	.55 5.47	3.06 3.06	3.06 3.06	5.39 6	48 6.48	5.39 4	52 4.72	S. Aids to Navigation / Buoyage (already adopted by the Applicant)
Vessels		avigating vessel	6 - Increased Traffic Density	Yes	People Minor-Single minor injury	Major-Multiple major injuries or single fatality																	<u> </u>
			7 - Loss of UKC 8 - Low Manoeuvrability of Vessels	No Yes	Property         Minor damage-Costs £10k –£100k           Environment         Negligible-Very Small Spill	Catastrophic damage-Costs >£10M  Catastrophic-Tier 3+																	
		ŀ	9 - Pilot Transfer Issues	Yes	Stakeholders Negligible-No significant effects	Major-National adverse media publicity and/or medium-term loss of revenue																	
	_ _		10-																				
		-	Adverse Environmental Conditions     Avoiding Other traffic	Yes	Narrative Glancing Blow  Vessels do not need to slow for Pilot Transfer	Fire / Sinking / Foundering Loss Cargo																	Enhanced Promulgation of Information (already adopted by the Applicant)     Shipping and Navigation Liaison Group (already adopted by the Applicant)
			2 - Avoiding Other traffic 3 - Constriction of Shipping Routes	Yes	Account incrineer in 2008 for Lightzies	Loss Cargo Loss of life																	Shipping and Navigation Liaison Group (already adopted by the Applicant)     Post Consent Monitoring for Operational Phase (requested by Trinity House)
	Collin	llision vessel less	4 - Equipment or Mechanical Failure	Yes		Cargo / Bunker Barge																	4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)
essel less the	han th	han 90m with other navigating	5 - Human Error	Yes			2.94	2.94 0.00	0.00 5.3	6.32	5.24 5.2	4 3.15	3.15 0.00	0.00 5.	42 6.50 5.	.42 5.42	3.06 3.06	3.06 0.00	0.00 5	34 6.43	5.34 4	06 4.23	4.16  5. Aids to Navigation / Buoyage (already adopted by the Applicant)
30111	anoc	vessel	6 - Increased Traffic Density	Yes	People         Minor-Single minor injury           Property         Minor damage-Costs £10k –£100k	Major-Multiple major injuries or single fatality  Catastrophic damage-Costs >£10M	+																
		-	8 - Low Manoeuvrability of Vessels	Yes	Environment Negligible-Very Small Spill	Major-Tier 3	-																
			9 - Pilot Transfer Issues	No	Stakeholders Negligible-No significant effects	Major-National adverse media publicity and/or medium-term loss of revenue																	
			10-																		4		
		-	Adverse Environmental Conditions     Avoiding Other traffic	Yes	Narrative Small vessels colliding  Glancing Blow / Loss of gear	Collides with larger vessel (WSV, Cargo, etc.)  Crossing / Head on Collision	+																Enhanced Promulgation of Information (already adopted by the Applicant)     Shipping and Navigation Liaison Group (already adopted by the Applicant)
			3 - Constriction of Shipping Routes	Yes	Lighting of WTG - displace fishing vessels	Sinking / Foundering / Capsize																	3. Post Consent Monitoring for Operational Phase (requested by Trinity House)
	Col	ollision Fishing	4 - Equipment or Mechanical Failure	Yes	Mostly - potting / netting (less likely trawling) (LOA 8-10m)																		4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)
Fishing or Recreationa	r Vesse	el or recreational aft with another	5 - Human Error 6 - Increased Traffic Density	Yes	Wake / Wash Impacts People Minor-Single minor injury	* assumes lights as per Kentish Flats  Catastrophic-Multiple fatalities	3.50	3.50 0.00	3.50 6.3	3.74	1.99 5.1	4 3.65	3.65 0.00	3.65 6.	32 3.82 2	.04 5.24	3.59 3.59	0.00 3.59	6.28 3	79 2.02	5.20 4	15 4.26	4.22 5. Aids to Navigation / Buoyage (already adopted by the Applicant)
	nav	avigating vessel	7 - Loss of UKC	No	Property Minor damage-Costs £10k –£100k	Moderate damage-Costs £100k -£1M	+																
			8 - Low Manoeuvrability of Vessels	Yes	Environment Negligible-Very Small Spill	Minor-Tier 1																	
		-	9 - Pilot Transfer Issues	No	Stakeholders Minor-Bad local publicity and/or possible short-term loss of revenue	Major-National adverse media publicity and/or medium-term loss of revenue																	
	-		1 - Adverse Environmental Conditions	Yes	Narrative Collides with small vessel at low speed	Collides at speed with other vessel															_		Enhanced Promulgation of Information (already adopted by the Applicant)
			2 - Avoiding Other traffic	Yes	Glancing blow	Crossing / Head on Collision																	2. Shipping and Navigation Liaison Group (already adopted by the Applicant)
			3 - Constriction of Shipping Routes	Yes		Sinking / Foundering / Capsize	_																3. Post Consent Monitoring for Operational Phase (requested by Trinity House)
		ollision of WSV king or transiting	4 - Equipment or Mechanical Failure 5 - Human Error	Yes			$+\Box$																4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)  5. Aids to Navigation / Buoyage (already adopted by the Applicant)
WSV	to fr	from Thanet or her OWF in area	6 - Increased Traffic Density	Yes	People Minor-Single minor injury	Catastrophic-Multiple fatalities	2.68	2.68 0.00	2.68 5.9	5.92 4.85	1.85 4.8	5 2.77	2.77 0.00	2.77 6.0	02 4.94 1	.89 4.94	2.73 2.73	0.00 2.73	5.98 4	91 1.87	4.91 3	74 3.83	3.79
	with	h another vessel	7 - Loss of UKC	No	Property Minor damage-Costs £10k –£100k	Major damage -Costs £1M - £10M																	
		-	8 - Low Manoeuvrability of Vessels	No	Environment Negligible-Very Small Spill	Minor-Tier 1	$+\Box$																
		-	9 - Pilot Transfer Issues 10 -	No	Stakeholders Minor-Bad local publicity and/or possible short-term loss of revenue	Major-National adverse media publicity and/or medium-term loss of revenue	$\dashv$																
			1 - Adverse Environmental Conditions		Narrative Slow Speed collision	High speed collision																	Enhanced Promulgation of Information (already adopted by the Applicant)
			2 - Avoiding Other traffic		Glancing Blow	Crossing / Head on Collision	_																Shipping and Navigation Liaison Group (already adopted by the Applicant)
			3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure		Minimal damage	Significant damage																	Post Consent Monitoring for Operational Phase (requested by Trinity House)      4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)
ilot Launch		ision Pilot Launch with another	5 - Human Error				2.60	2 60 0 00	260 41	00 400	105 40	5 277	2 77 0 00	277 41	04 4 04 1	90 4 04	2.72 2.72	0.00 2.72	4 00 4	90 1 97	4 90 2	11 2 40	5. Aids to Navigation / Bugyage (already adopted by the Applicant)
ot Launcr		with another avigating vessel	6 - Increased Traffic Density		People Minor-Single minor injury	Major-Multiple major injuries or single fatality	2.00	2.08 0.00	2.00 4.	4.05	1.05 4.0	3 2.77	2.77 0.00	2.77 4.	34 4.34 1	.09 4.94	2.72 2.72	0.00 2.72	4.09 4	09 1.07	4.69 3	41 3.49	3.42
			7 - Loss of UKC		Property         Minor damage-Costs £10k –£100k           Environment         Negligible-Very Small Spill	Major damage -Costs £1M - £10M Minor-Tier 1	-																
			9 - Pilot Transfer Issues		Stakeholders Minor-Bad local publicity and/or possible short-term loss of revenue	Major-National adverse media publicity and/or medium-term loss of revenue	-																
			10 -																				
			1 - Adverse Environmental Conditions	Yes	Narrative Glancing Blow	Fire / Sinking / Foundering	+																Enhanced Promulgation of Information (already adopted by the Applicant)      Skingles and Nazigetine Lights Court (already adopted by the Applicant)
			2 - Avoiding Other traffic 3 - Constriction of Shipping Routes	Yes		Loss Cargo Loss of life	$\dashv$																Shipping and Navigation Liaison Group (already adopted by the Applicant)     Post Consent Monitoring for Operational Phase (requested by Trinity House)
		L .	4 - Equipment or Mechanical Failure	Yes		Large vessel / Tanker / Dangerous Goods																	4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)
	Class	ass 1 or 2 Vaccal	4 Equipment of Mechanical Fanare						4.87 5.	5.15	5.15 5.1	5 3.03	3.03 0.00	5.31 5.	47 5.47 5.	.47 5.47	2.89 2.89	0.00 5.11	5.33 5	33 5.33	5.33 4	44 4.77	5. Aids to Navigation / Buoyage (already adopted by the Applicant)
ass 1 or 2 Vessels	2 come	ass 1 or 2 Vessel mes into contact	5 - Human Error	Yes			2.72	2.72   0.00															
ass 1 or 2 Vessels	2 come			Yes Yes	People Minor-Single minor injury  Property Minor damage-Cross F10k = F100k	Major-Multiple major injuries or single fatality  Major damage -Cross £1M -£1DM	2.72	2.72 0.00															
ass 1 or 2 Vessels	2 come	mes into contact h a WTG or other	5 - Human Error	Yes Yes No Yes	People Minor-Single minor injury Property Minor damage-Costs £10k -£100k Environment Negligible-Very Small Spill	Major-Multiple major injuries or single fatality  Major damage -Costs £1M - £10M  Major-Tier 3	2.72	2.72 0.00															
ass 1 or 2 Vessels	2 come	mes into contact h a WTG or other	5 - Human Error 6 - Increased Traffic Density 7 - Loss of UKC	Yes Yes No Yes Yes	Property Minor damage-Costs £10k-£100k	Major damage -Costs £1M - £10M	2.72	2.72 0.00															
lass 1 or $i$ Vessels	2 come	mes into contact h a WTG or other	S - Human Error 6 - Increased Traffic Density  - Loss of URC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues	Yes	Property Minor damage-Costs £10k - £100k Environment Negligible-Very Small Spill Stakeholders Minor-Bad local publicity and/or possible short-term loss of revenue	Major damage -Costs £1M - £10M  Major-Tier 3  Major-National adverse media publicity and/or medium-term loss of revenue	2.72	2.72 0.00															1 Sphanced Promulation of Information (Stroydy advanted by the Applicant)
ass 1 or 2 Vessels	2 come	mes into contact h a WTG or other	5 - Human Error 6 - Increased Traffic Density 7 - Loss of UKC 8 - Low Manoeuvrability of Vessels	Yes	Property Minor damage-Costs £10k - £100k Environment Negligible-Very Small Spill	Major damage -Costs £1M - £10M Major-Tier 3	2.72	2.72 0.00															Enhanced Promulgation of Information (already adopted by the Applicant)     Shipping and Navigation Liaison Group (already adopted by the Applicant)
lass 1 or 2 Vessels	2 come	mes into contact h a WTG or other	5 - Human Error 6 - Increased Traffic Density  Loss of UKC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues 10 - 1 - Adverse Environmental Conditions	Yes	Property Minor damage-Costs £10k - £100k Environment Negligible-Very Small Spill Stakeholders Minor-Bad local publicity and/or possible short-term loss of revenue	Major damage -Costs £1M - £10M Major-Tier 3 Major-National adverse media publicity and/or medium-term loss of revenue Fire / Sinking / Foundering	2.72	2.72 0.00															
Vessels	2 comwith a	mes into contact h a WTG or other structure	5 - Human Error 6 - Increased Traffic Density Less of LINC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues 10 1 - Adverse Environmental Conditions 2 - Avoiding Other traffic 3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure	Yes	Property Minor damage-Costs £10k - £100k Environment Negligible-Very Small Spill Stakeholders Minor-Bad local publicity and/or possible short-term loss of revenue	Major damage-Costs £1M - £10M Major-Tier 3 Major-National adverse media publicity and/or medium-term loss of revenue  Fire / Sinking / Foundering Loss Cargo	2.72	2.72 0.00															2. Shipping and Navigation Liaison Group (already adopted by the Applicant) 3. Post Consent Monitoring for Operational Phase (requested by Trinity House) 4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)
Vessels	2 comwith:	mes into contact h a WTG or other structure	5 - Human Error 6 - Increased Traffic Density Loss of URC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues 1 - Adverse Environmental Conditions 2 - Avoiding Other traffic 3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure 5 - Human Error	Yes Yes Yes Yes	Property Minor damage-Costs £10k - £100k Environment Negligible-Very Small Spill Stakeholders Minor-Bad local publicity and/or possible short-term loss of revenue  Narrative Glancing Blow	Major damage -Costs £1M - £10M Major-Tier 3 Major-National adverse media publicity and/or medium-term loss of revenue  Fire / Sinking / Foundering Loss Cargo Loss of life Large vessel / Tanker / Dangerous Goods			4.93 5	5.18 5.18	5.18 5.1	8 2.94	2.94 0.00	) 5.18 5.	37 5.37 5	.37 5.37	2.87 2.87	0.00 5.09	5.30 5	30 5.30	5.30 4	48 4.67	Shipping and Navigation Lisiton Group (already adopted by the Applicant)     Post Consent Monitoring for Operational Phase (requested by Trinity House)
Vessels	2 comwith:	mes into contact h a WTG or other structure  asss 3 or 4 Vessel mes into contact	5 - Human Error 6 - Increased Traffic Density Less of LINC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues 10 1 - Adverse Environmental Conditions 2 - Avoiding Other traffic 3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure	Yes Yes Yes Yes	Property Minor damage-Costs £10k - £100k Environment Negligible-Very Small Spill Stakeholders Minor-Bad local publicity and/or possible short-term loss of revenue	Major damage -Costs £1M - £10M Major-Tier 3 Major-National adverse media publicity and/or medium-term loss of revenue  Fire / Sinking / Foundering Loss Cargo Loss of life			4.93 5.	5.18 5.18	5.18 5.1	8 2.94	2.94 0.00	5.18 5.	37 5.37 5	.37 5.37	2.87 2.87	0.00 5.09	5.30 5	30 5.30 !	5.30 4	48 4.67	2. Shipping and Navigation Liaison Group (already adopted by the Applicant) 3. Post Consent Monitoring for Operational Phase (requested by Trinity House) 4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)
Class 3 or 4	2 comwith:	mes into contact h a WTG or other structure  asss 3 or 4 Vessel mes into contact h a WTG or other	5 - Human Error 6 - Increased Traffic Density Loss of URC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues 1 - Adverse Environmental Conditions 2 - Avoiding Other traffic 3 - Constriction of Shipping Routes 4 - Equipment or Mechanical Failure 5 - Human Error	Yes Yes Yes Yes	Property Minor damage-Costs £10R-£100k Environment Negligible-Very Small Spill Stakeholders Minor-Bad local publicity and/or possible short-term loss of revenue  Narrative Glancing Blow  People Minor-Single minor injury	Major damage-Costs £1M - £10M Major-National adverse media publicity and/or medium-term loss of revenue  Fire / Sinking / Foundering Loss Cargo Loss of life Large vessel / Tanker / Dangerous Goods  Major-Multiple major injuries or single fatality			4.93 5	5.18	5.18 5.1	8 2.94	2.94 0.00	5.18 5.	37 5.37 5	.37 5.37	2.87 2.87	0.00 5.09	5.30 5	30 5.30 !	5.30 4	18 4.67	2. Shipping and Navigation Liaison Group (already adopted by the Applicant) 3. Post Consent Monitoring for Operational Phase (requested by Trinity House) 4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)

Parties Partie

					Conse	quences			Baseline	e Risk				Inhere	ent Risk				Resid	ual Risk					Sucing Likelihood 5
Vessel Type	Hazard Detail	Possible Causes	Y/N Ty	pe	Most Likely Outcome	Worst Credible Outcome	M aldo	roperty mironment	takeholders	Worst (	Credible Ris	rakeholders r	Most Like	wironment takeholders	Worst edo	t Credible Risk	take holders reple	Most Likely	rake holders	Wo e obje	roperty invironment	rake holders	Saseline Risk	Residual Risk	Additional Risk Controls
₩ Vessel less than	Commercial Vessel less than 90m comes	Adverse Environmental Conditions     Avoiding Other traffic     Constriction of Shipping Routes     Equipment or Mechanical Failure     Human Error	Yes Na Yes Yes Yes Yes Yes	arrative	Slow Speed contact Glancing blow Minimal damage	High speed contact Significant damage			S	4 4		× «					× 6			4	<u> </u>	Š			1. Enhanced Promulgation of Information (already adopted by the Applicant)     2. Shipping and Navigation Liaison Group (already adopted by the Applicant)     3. Post Consent Monitoring for Operational Phase (requested by Trinity House)     4. Enhanced Optimisation of TECW line of orientation and symmetry (already adopted by Applicant)     5. Aids to Navigation / Buoyage (aiready adopted by the Applicant)     Medium
90m	into contact with a WTG or other structure	6 - Increased Traffic Density  1 - Loss of UKC  8 - Low Manoeuvrability of Vessels  9 - Pilot Transfer Issues	No Pr Yes En	ople operty vironment akeholders		Major-Multiple major injuries or single fatality  Major damage -Costs £1M - £10M  Major-Tier 3  Major-National adverse media publicity and/or medium-term loss of revenue	2.72	2.72 0.00	2.72 4	4.89 4.8	89 4.89	4.89 2.89	9 2.89 (	0.00 2.89	5.06 5.	.06 5.06 5	5.06 2.8	3 2.83 0	00 2.83	5.00	5.00 5.00	5.00	3.64 3.	80 3.74	
wsv Hact	WSV comes into contact with a WTG	Adverse Environmental Conditions     Avoiding Other traffic     Constriction of Shipping Routes     Equipment or Mechanical Failure     Human Error	Yes Na Yes Yes Yes Yes Yes	arrative	Slow Speed contact Glancing blow Minimal damage	High speed contact Significant damage	2.68	2.68 0.00	2.68 4	4.85 4.8	85 1.85	4.85 2.77	7 2.77	0.00 2.77	4.94 4.	.94 1.89 4	4.94 2.7	4 2.74 0	.00 2.74	4.92	4.92 1.88	4.92	3.41 3.	49 3.4	Enhanced Promulgation of Information (already adopted by the Applicant)     Shipping and Navigation Liaison Group (already adopted by the Applicant)     Post Consent Monitoring for Operational Phase (requested by Trinity House)     Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)     Alds to Navigation / Buoyage (already adopted by the Applicant)     Medium
ā	or other structure whilst navigating	6 - Increased Traffic Density  12-Loss of UKC  8 - Low Manoeuvrability of Vessels  9 - Pilot Transfer Issues	No Pr Yes En No St	akeholders	Minor: Single minor injury Minor damage-Costs £10k-£100k Negligible-Very Small Spill Minor-Bad local publicity and/or possible short-term loss of revenue	Major-Multiple major injuries or single fatality Major damage <pre>C1</pre> Minor-Tier 1  Major-National adverse media publicity and/or medium-term loss of revenue																			
Fishing or Recreational	Narrative	1 - Adverse Environmental Conditions     2 - Avoiding Other traffic     3 - Constriction of Shipping Routes     4 - Equipment or Mechanical Failure     5 - Human Error     6 - Increased Traffic Density     1 - Loss of UKC		ople	Slow Speed contact Glancing blow Minimal damage Minor-Single minor injury Minor damage-Costs £10k-£100k	High speed contact  Significant damage  Major-Multiple major injuries or single fatality  Major damage -Costs £1M - £10M	3.09	3.09 0.00	3.09 5	5.14 3.7	74 1.99	3.74 3.21	1 3.21 (	3.21	5.24 3.	.82 2.04 :	3.82 3.1	8 3.18 0	00 3.18	5.22	3.80 2.03	3.80	3.55 3.	65 3.6:	1. Enhanced Promulgation of Information (already adopted by the Applicant)     2. Shipping and Navigation Liaison Group (already adopted by the Applicant)     3. Post Consent Monitoring for Operational Phase (requested by Trinity House)     4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)     5. Aids to Navigation / Buoyage (already adopted by the Applicant)     Medium
		8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues 10 - 1 - Adverse Environmental Conditions 2 - Avoiding Other traffic	Yes En	vironment akeholders	Negligible-Very Small Spill	Minor-Tier 1 Major-National adverse media publicity and/or medium-term loss of revenue High speed contact Significant damage								H										+	Enhanced Promulgation of Information (already adopted by the Applicant)     Medium     Shipping and Navigation Laison Group (already adopted by the Applicant)     Medium
Pilot Launch	Pilot Launch comes into contact with a WTG or other structure	- **Notioning Guider Units*      - **Guipment or Mechanical Failure     - Human Error     - Increased Traffic Density     - Human Error     - Increased Traffic Density     - Young Traffic Densi	No Pr	ople operty vironment akeholders	Minimal damage  Minor-Single minor injury  Minor damage-Costs £10k-£100k  Megligible-Very Small Spill  Negligible-Very Small Spill	Major-Multiple major injuries or single fatality Major damage-Costs £1M - £10M Minor-Tier 1 Maior-Mational adverse media publicity and/or medium-term loss of revenue	2.68	2.68 0.00	2.68 4	4.85 3.5	50 1.85	3.50 2.77	7 2.77 (	2.77	4.94 3.	.57 1.89 :	3.57 2.7	5 2.75 0	.00 2.75	4.92	3.55 1.88	3.55	3.24 3.	32 3.30	S. Post Consent Monitoring for Operational Phase (requested by Trinity House)     Low     4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)     Medium     S. Aids to Navigation / Buoyage (already adopted by the Applicant)
	Displacement or constriction of shipping routes and	Adverse Environmental Conditions     Avoiding Other traffic     Constriction of Shipping Routes     Equipment or Mechanical Failure	Yes Na Yes Yes Yes		Slow Speed grounding  Re-float on the same tide	Vessel unable to re-float on same tide / assistance required Fire / Sinking / Foundering Loss Cargo Loss of life																		t	Enhanced Promulgation of Information (already adopted by the Applicant)     Low     Shipping and Navigation Lisison Group (already adopted by the Applicant)     Low     Post Consent Monitoring for Operational Phase (requested by Trinity House)     Low     Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)     Low
Class 1 or 2 Vessels	the loss of depth along cable route results in a Class 1 or 2 vessel running aground.	S - Human Error 6 - Increased Traffic Density 7 - Loss of UKC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues	Yes Pr Yes En	ople operty vironment akeholders	Minor-Single minor injury Minor damage-Costs £10k-£100k Minor-Tier 1 Minor-Bad local publicity and/or possible short-term loss of revenue	Large vessel / Tanker / Dangerous Goods Major-Multiple major injuries or single fatality Catastrophic damage-Costs >E10M Catastrophic-Tier 3+ Major-National adverse media publicity and/or medium-term loss of revenue	2.54	2.54 2.54	2.54 3	3.53 4.8	89 4.89	5.97 2.69	9 2.69 2	2.69 2.69	3.67 5.	.06 5.06 6	6.14 2.6	3 2.63 2	63 2.63	3.61	4.99 4.99	6.07	3.97 4.	13 4.0	6 S. Aids to Navigation / Buoyage (already adopted by the Applicant) Medium
Class 3 or 4	Displacement or constriction of shipping routes and the loss of depth	Adverse Environmental Conditions     Avoiding Other traffic     Constriction of Shipping Routes     Equipment or Mechanical Failure     Human Error	Yes Na Yes Yes Yes Yes Yes	arrative	Slow speed grounding Vessel touches bottom Vessel re-floats on same tide	Higher speed Grounding  Vessel firmly aground  Vessel is not re-floated on same tide	265	265 265	265 3	2.51 .40	00 400	6.06 2.76	5 276	276 276	271 5	.11 5.11 (	£10 277	1 271 2	71 271	2.67	E 06 E 06	£ 12	407 4	18 41	1. Enhanced Promulgation of Information (already adopted by the Applicant)     2. Shipping and Navigation Liaison Group (already adopted by the Applicant)     3. Post Consent Monitoring for Operational Phase requested by Trinity House)     4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)     5. Aids to Navigation / Buoyage (already adopted by the Applicant)     Medium
Vessels	along cable route results in a Class 3 or 4 vessel running aground.	6 - Increased Traffic Density 7 - Loss of UKC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues	Yes St	operty vironment akeholders		Major-Multiple major injuries or single fatality  Catastrophic damage-Costs >E10M  Catastrophic-Tier 3+  Major-National adverse media publicity and/or medium-term loss of revenue		2.03	200 0	3.02		550 270		2.70	3.72	3.11	0.20	2 2.72	2.72	3.03	3.00	0.23			
Vessel less than 90m	Displacement or constriction of shipping routes and the loss of depth along cable route results in a vessel less	1 - Adverse Environmental Conditions     2 - Avoiding Other traffic     3 - Constriction of Shipping Routes     4 - Equipment or Mechanical Failure     5 - Human Error     6 - Increased Traffic Density	Yes Yes Yes Yes Yes Yes Pe	ople	Slow speed grounding  Vessel touches bottom  Vessel re-floats on same tide  Minor-Single minor injury	Higher speed Grounding  Vessel firmly aground  Vessel is not re-floated on same tide  Major-Multiple major injuries or single fatality	2.65	2.65 2.65	i 2.65 3	3.78 5.1	19 3.78	5.19 2.73	3 2.73	2.73	3.86 5.	.28 3.86 !	5.28 2.7	0 2.70 2	.70 2.70	3.83	5.25 3.83	5.25	3.74 3.	83 3.80	1. Enhanced Promulgation of Information (already adopted by the Applicant)     2. Shipping and Navigation Lisison Group (already adopted by the Applicant)     1. Down Consent Monitoring for Operational Phase (requested by Trinity House)     1. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)     1. Down Consent Monitoring for Operational Phase (requested by Trinity House)     1. Adds to Navigation / Buoyage (already adopted by the Applicant)     1. Medium
	than 90m running aground.	7 - Loss of UKC 8 - Low Manoeuvrability of Vessels 5 - Pilot Transfer Issues 10 1 - Adverse Environmental Conditions	Yes En	operty vironment akeholders arrative	Minor damage-Costs £10k -£100k Minor-Tier 1 Minor-Bad local publicity and/or possible short-term loss of revenue  Slow speed grounding	Catastrophic damage-Costs >E10M  Catastrophic-Tier 3+  Major-National adverse media publicity and/or medium-term loss of revenue  Higher speed Grounding																			Enhanced Promulgation of Information (already adopted by the Applicant)     Low
Fishing or Recreational	Displacement or constriction of shipping routes and the loss of depth along cable route results in a Fishing vessel or recreational	Avoiding Other traffic     Constriction of Shipping Routes     Equipment or Mechanical Failure     Human Error     Increased Traffic Density	Yes Yes Yes Yes Yes Pe No Pr		Vessel touches bottom  Vessel re-floats on same tide  Minor-Single minor injury  Minor-Single minor injury	Vessel firmly aground  Vessel is not re-floated on same tide  Major-Multiple major injuries or single fatality	2.98	0.00	2.98 4	4.77 3.4	42 1.81	3.42 3.03	3 0.00 (	3.03	4.81 3.	.46 1.83	3.46 3.0	1 0.00 0	00 3.01	4.79	3.44 1.82	3.44	3.15 3.	19 3.1	Shipping and Navigation Liston Group (already adopted by the Applicant)     Post Consent Monitoring for Operational Phase (requested by Trinity House)     Low     4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)     Low     S. Aids to Navigation / Buoyage (already adopted by the Applicant)
	vessel running aground.	7- Loss of UKC 8 - Low Manoeuvrability of Vessels 9 - Pilot Transfer Issues 10 -	Yes En	operty vironment akeholders	Negligible-Costs <£10k Negligible-Very Small Spill Minor-Bad local publicity and/or possible short-term loss of revenue	Moderate damage-Costs £100k-£1M Minor-Tier 1 Moderate-Bad widespread publicity and/or short-term loss of revenue																			

Parties Partie

					α	nsequences			Baseli	line Risk				Inher	ent Risk				Residual	Risk					ng ükelihood s	ng Likelihood S
									ala Biala		on Condible Di		Mantilla	d. Bisk	18/2-24	andible Bist		*****   :	Niat.	W C	Jihla Rial				Reduci	Reduci
OF DESCRIPTION OF THE PROPERTY	Hazard Detail	Possible Causes	Y/N Type	•	Most Likely Outcome	Worst Credible Outcome	People	Most Likel	Erwironment Stakeholders	People	Property Environment	Stakeholders	Most Like	Environment Stakeholders	People Property	Stake bolders	People	Property Professional Professio	Stakeholders	Moust Cue	Environment aiding	Baseline Risk	Inherent Risk Residual Risk	Additional Risk Controls	Risk Control Effectiveness at 1	Risk Control Effectiveness at I
		1 - Adverse Environmental Conditions	Yes Narra	ative	Slow speed grounding	Higher speed Grounding																		Enhanced Promulgation of Information (already adopted by the Applicant)	Low	159
		2 - Avoiding Other traffic	Yes		Vessel touches bottom	Vessel firmly aground																		2. Shipping and Navigation Liaison Group (already adopted by the Applicant)	Low	15%
	Displacement or	3 - Constriction of Shipping Routes	Yes		Vessel re-floats on same tide	Vessel is not re-floated on same tide	2.98 2.98 0.0																3. Post Consent Monitoring for Operational Phase (requested by Trinity House)	Low	15%	
	constriction of	4 - Equipment or Mechanical Failure	Yes																					4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)	Low	15%
17 by	shipping routes and the loss of depth		Yes					200	200	477	2 42   1 01	4.77		202	4.01 3.4		2 01	201 00	201	70 2 44	1 02   4 70			5. Aids to Navigation / Buoyage (already adopted by the Applicant)	Low	15%
17 S WSV	along cable route results in a WSV	6 - Increased Traffic Density	Yes Peop	ole	Minor-Single minor injury	Major-Multiple major injuries or single fatality	2.98	2.98	0.00 2.98	4.77	3.42 1.61	4.// 3.	.05 3.05	0.00 3.03	4.01 3.4	1.03 4.0	3.01	3.01 0.0	3.01 4	3.44	1.02 4.79	3.42	3.40 3.4			
	vessel running	7 - Loss of UKC	No Prop	erty	Minor damage-Costs £10k –£100k	Moderate damage-Costs £100k -£1M																				
	aground.	8 - Low Manoeuvrability of Vessels	Yes Envir	ronment	Negligible-Very Small Spill	Minor-Tier 1																				
		9 - Pilot Transfer Issues	No Stake	eholders	Minor-Bad local publicity and/or possible short-term loss of revenue	Major-National adverse media publicity and/or medium-term loss of revenue																				
		10 -																								
		1 - Adverse Environmental Conditions	Yes Narra	ative	Slow speed grounding	Higher speed Grounding																		Enhanced Promulgation of Information (already adopted by the Applicant)	Low	15%
		2 - Avoiding Other traffic	Yes		Vessel touches bottom	Vessel firmly aground																		2. Shipping and Navigation Liaison Group (already adopted by the Applicant)	Low	15%
	Displacement or	3 - Constriction of Shipping Routes	Yes		Vessel re-floats on same tide	Vessel is not re-floated on same tide																		3. Post Consent Monitoring for Operational Phase (requested by Trinity House)	Low	15%
	constriction of	4 - Equipment or Mechanical Failure	Yes																					4. Enhanced Optimisation of TEOW line of orientation and symmetry (already adopted by Applicant)	Low	15%
au B	shipping routes and the loss of depth		Yes				2.77			450		450			462 222			270						5. Aids to Navigation / Buoyage (already adopted by the Applicant)	Low	15%
18 S Pilot Launch	along cable route		Yes Peop	ile	Minor-Single minor injury	Major-Multiple major injuries or single fatality	2.77	2.// 0	0.00 2.77	4.59	3.28 1.72	4.59 2.	.81 2.81	0.00 2.81	4.63 3.3	1.74 4.6	2.79	2.79 0.0	2.79 4	3.30	1./3 4.61	3.25	3.28			
l I	results in a Pilot Launch running	7 - Loss of UKC	No Prop	erty	Minor damage-Costs £10k –£100k	Moderate damage-Costs £100k -£1M																				
	aground.	8 - Low Manoeuvrability of Vessels	Yes Envir	ronment	Negligible-Very Small Spill	Minor-Tier 1																				
		9 - Pilot Transfer Issues	No Stake	eholders	Minor-Bad local publicity and/or possible short-term loss of revenue																					
		10 -																								

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