Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

Annex E to Appendix 28 to Deadline 6 Submission: Applicant's Response to Port of London Authority and Estuary Services Ltd Consultation Response

Relevant Examination Deadline: 6

Submitted by Vattenfall Wind Power Ltd

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Revision A

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Consultation document	Document reference	Response summary/extract	PLA/ESL comments	Applicant regard
Document 1 Appendix 14 to the Deadline 4 Submission – Structures Exclusion Zone Explanatory Report	Section 3.3	'Sea Room' and 'Buffers'	The PLA and ESL agree with the position of the Applicant that sea room should be a calculation of operational area (be it on passage or pilot transfer) together with a buffer.	The Applicant notes this agreement and does not have anything further to note.
	Section 3.4, paras 21-23	Vessel assumptions	Figure 38 in the NRA (Section 5.6 *Seasonality)* summarises the daily transit rate through Traffic Gate E, which summarises a daily transit rate of between 32 (winter) and 45 (summer) transits per day (based on the results of the traffic survey). The Applicant has stated in their response to ISH8 action point 12 (Appendix 7 to deadline 5/para 88) that Gate E is used to analyse vessels per day on the inshore route. Gate E is not assessed in the NRAA per se; the transit analysis in the NRAA covers the area between Elbow Buoy to SEZ and NE Spit Buoy to SEZ. It would appear that the overall traffic per day figure for the entire inshore route is derived from these two positions. The PLA and ESL do not think this is an accurate reflection of vessels per day on the inshore route, as carrying out an analysis from these two positions alone would not in their experience be representative of the traffic in the area as a whole. The Applicant suggests that they think it is unlikely that the frequency of larger vessels using the inshore route will increase given historical evidence. However in the NRAA (para 121) they acknowledge a trend toward vessel size increasing. The PLA and ESL not consider it a fair assumption, based on historical use, that the growing number of larger vessels will still only use the inshore route with the same frequency. The PLA and ESL would agree that factors such as a reduction in sea room on the inshore route, as a result of the extended wind farm, could create a restriction when assessing the routes suitability for larger vessels.	The Applicant has provided clarification of Gate E at Para 88 of REP5-012 and also notes the numbers utilising the inshore route were discussed with ESL at ISH 8 (Ref Para 110-f of REP5-018). Following queries at the early stage of Examination from IP's the Applicant has sourced additional AIS data that has been presented into the examination (REP04-30 provides further information on this and how it is benchmarked in relation to the data from the original NRA). The additional information has been analysed in relation to gates at locations which were agreed as key reference points with IP's at the workshop on 27-Feb-2019 (see REP4-018) – specifically between Elbow Buoy and the wind farm and NESP Racon Buoy and given that commercial vessels using the inshore route and/or accessing NESP pilot boarding station transit through these gates the Applicant does consider these to be representative of the traffic (and notes that the inshore route 'gate 1'as provided in the PLA AIS data is consistent with this). A plot showing these various gates is provided at the end of this document. Further to ensuring an understanding of the area as a whole, which the Applicant agrees is important, the Applicant has undertaken collision risk modelling using the Marico Marine collision risk domain analysis modelling (as reported in the NRA) and also, more recently using an independent provider, Anatec Ltd, who have modelled the study area (Ref: Appendix 42 to Deadline 6), in order to understand vessel traffic and interactions in the area as a whole (and including the inshore route). The Applicant has provided further basis behind the future traffic forecast and vessel sizes with reference to published data on traffic trends and also with reference to existing traffic data which shows the analysis of vessel sizes in the wider study area and those, by size, that currently do not elect to utilise the inshore route due to general guidance and existing parameters such as the bathymetry and routes/lanes into the Thames estuary. The Applicant has nonetheless determined the SEZ on the basis of a larger vessel size (noting that these vessels of circa 333m LOA appear to be being considered by PLA and LPC at a limiting draught) and notes that the geometry of the proposed SEZ does not preclude their access, notwithstanding the Applicant does not agree with the position that

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				suggests more vessels of this size will utilise the inshore route in the future.
	Section 4.3	Sea room requirements for vessels on passage	The Applicant concludes, based on the MSP guidance, that it has adopted a highly precautionary approach by allowing for four 333m vessels. However, the PLA and ESL consider that a fuller adoption of the MSP guidance would be necessary in order for the approach to be a precautionary approach. The Applicant should included *[sic]* the recommended distance for a safe turn to starboard in accordance with the COLREGs; it did not. If it had, that would give a 'baseline' distance/sea room for passage of 2.72nm on the inshore route (as demonstrated in the PLA and ESL's deadline 4c submission/EN10084/2.1.3 and 2.1.4). It would then be precautionary to attempt to 'factor in' other navigational, and therefore sea room, requirements, such as the fact that the route has within it a high volume of crossing traffic, a pilot station, the North East Spit bank and the existing TOW itself, as well as an anchorage to the west.	The Applicant maintains that the allowance for multiple (up to four) 333m LOA vessels transiting at the same time is highly precautionary and thus the Applicant has embedded conservatism in the sea room calculations. This is evidenced by the exceptional nature of 333m LOA vessels in the datasets and also the highly unlikely scenario of multiple vessels of this size in the area at the same time. The Applicant has applied the MSP guidance in full together with the guidance from MGN543 and the various references that both these documents themselves make reference to. It is understood that the appropriateness of these documents and the manner of application has been agreed with other IP's. With regards to 2.1.3 and 2.1.4 referenced in this comment, the Applicant does not consider that the IP has correctly applied the guidance and has responded more fully under item 2.1.2 of their response to PLA and ESLs Deadline 4C submission (Ref page 5/28, Item 2.1.2 of REP5-024) and further notes that the guidance and COLREGS do not indicate that the allowance for a starboard turn should be provided for outside (or in addition to) any sea room for a route. In any case, the Applicant confirms that sea room has been provided to allow for multiple concurrent transits and vessels turning with the other interactions.
	Section 4.4, paras 36-37	Sea room requirements for pilot transfer/ boarding operations	Figure 3 indicates the location of a pilot launch when operating at a speed of 10 knots or less. We have concerns with the methodology of using launch speed density/area to reflect boarding density. There is a significant area of low density to the east of the North Foreland, in very close proximity to the shore that, under no circumstances, would be used for boarding and landing. There is no indication of how the 6441 boarding and landing acts by ESL in this area 2018 have been divided across the density map (figure 2), and it is not clear what percentage or numerical value is represented by 'high/medium/low'. Therefore it is very difficult to understand the number of vessels represented by 1% and 3% in Table 10. In addition, the density map is based on a launch speed of 10 knots and all speeds below this, ESL board and land pilots between 5 - 6 knots. As recognised by the applicant, there are many reasons a pilot launch will be travelling at 10 knots or less e.g. scheduling reasons (waiting for vessels) or poor met ocean conditions.	The technique of filtering AIS data on vessel speeds by density to create a heat map, using GIS tools, to provide indication of specific activity is a commonplace industry methodology and this was initially undertaken by the Applicant in the 2017 Pilotage study which was shared with PLA and ESL (Ref: https://corporate.vattenfall.co.uk/globalassets/uk/projects/thanet-ext/peir-nov-2017/volume-4/vol4ann10-1-pilotagestudy.pdf) and discussed at meetings with them on 03 July 2017 and 14 August 2017 (REP1-007). The Applicant also notes (as per para 110-e of REP5-018) the method and use of this was also directly clarified with ESL during ISH8.This is a useful proxy method to demonstrate spatial distribution and the Applicant has also always sought to supplement with other data/consultation where this has been provided. This is all bought together in Figure 16 of the NRA Addendum (REP5-039) which shows four sub-plots with filters on two separate AIS datasets by two separate speeds <7kts (noting this aligns with the reference

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			ESL has always maintained a requirement for 1nm as a buffer in addition to a 2nm working area whereas the Applicant refers to “a 0.5nm buffer” which “has been allocated to declared safe sea room.”	to the 5-6kts stated by PLA/ESL in their comment) and <10kts and the Applicant considers this, when considered in parallel with Figure 13 and the confirmatory submissions provided by ESL in Figure 14 and 15, does provide a good proxy of spatial distribution for ESL activities for the purposes of understanding the area used for boarding and landings. With regards to the IP comments on Figure 3, the Applicant notes this is the same as the bottom right subplot presented in Figure 16 of the NRA Addendum (REP5-039). When considering the other subplots (where filters have been provided at different speeds on different data) these show less concentration/density of activity over the area of North Foreland and thus the Applicant has not placed weight on potential boardings/landings in this area (consistent with the IP position that activity in this area may be due to other reasons such as ESL launches on transit at reduced speed for commercial reasons – e.g. adjusting to time on station or when passage is slowed due to reduced metocean conditions) and particularly when considered in the context of the consultation with ESL and their submissions at Figure 14 and Figure 15. Nonetheless, the Applicant notes that importantly – all these plots do provide confirmation of the significant concentration of activity and (*ergo*) boarding/landings in the region to the immediate north east of the NE Spit pilot boarding diamond. With regards to the 6441 declared landings it is not possible to relate the density plots to these absolute numbers as they relate to two different datasets and periods – and hence why the Applicant has adopted a ratio estimate and non-dimensioned number for purposes of spatial comparison (the basis of it being a proportional estimate is explained within the text). The 6441 was provided by PLA (Ref: REP1-137, Table Item 10) for the period of Jan-2017 to Dec-2017 – noting this did not include any spatial breakdown) whereas the density spatial analysis was derived from the Applicants Mar-2017 to Feb-2018 AIS data) and thus the Applicant sought to estimate a ratioed relationship on the basis of the information that had been applied by IP’s at that time. It is noted that ESL subsequently provided breakdown of declared transfers by spatial area (Figure 14 and Figure 15 of REP5-039) which has been compared to the various AIS datasets analysed by the Applicant as described in Para 33 to 38 of the same document. The Applicant notes the comment *“ESL has always maintained a requirement for 1nm as a buffer in addition to a 2nm working area whereas the Applicant refers to “a 0.5nm buffer” which “has been allocated to declared safe sea room.””* and draws attention that the

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				context of this referenced statement relates to a 0.5nm buffer offset as presented in a column within Table 11 that shows turning distances for various vessels for reference/context purposes. Furthermore it is noted that at no point have ESL sought to provide evidence for the requirement for 2nm working area and whilst from discussions the Applicant understands this relates to turning circles of large vessels, it has not been made clear why 2nm is required as opposed to any other distance. Nonetheless the Applicant has, in the same document (Section 4.2), recognised the requested 1nm buffer and this is provided for at the NE Spit pilot transfer area and with reference to the NE Spit and Elbow this can also be considered applied on the basis of assumed vessel sizes and numbers (as summarised in Para 34-35 of REP4C-003).
	Section 6.2, paras 47-50	Sea room at NE Spit Pilot Boarding Diamond, basis of amendment	The area of the SEZ that leaves 3nm or above is a reduced strip less than 1.3nm 'deep' (as demonstrated in *Figure 1* of our deadline 4c submission). As shown in Figure 1, the width of 2nm + 1nm buffer has become a narrow 'column' which is approximately 1.3nm deep. In order to utilise this area ESL would have to bring a higher number of vessels into a smaller boarding ground which would lead to appropriate lees being compromised. There is not a clear 2nm with 1nm buffer to the north of line B until east of the North East Spit Buoy, which itself is 3nm north of the inner boarding position. South of line C in Figure 1, there is not an area of 2nm with 1nm buffer until approximately 3nm south east of the Elbow Buoy.	The Applicant has provided a response to this item at 2.2.1 of REP5-024. It also does not understand the basis of *"would lead to appropriate lees being compromised"* because the boarding ground provides (and exceeds) the 2nm plus 1nm as requested (and thus lees can be provided within this area) and the proposed area aligns with the evidence showing distribution of transfers as per Para 34-38 of REP5-039. The term 'deep draught pilot transfer area' refers to the area delineated by the sector light/no anchoring line extending from North Foreland to NE Spit Racon Buoy which delineates a boundary that the larger draught vessel adopted for the sea room calculations would not transit. This does not seek to infer deep draught status that is designated by the PLA for the existing Tongue and NE Goodwin pilot boarding stations as deep water pilot boarding stations (noting that Tongue deep water has been demonstrated to be used infrequently due to ESL preference to transfers nearer NE Spit pilot boarding station). Notwithstanding this it is important to note that a significant majority of vessels utilising the wider study area (for transit and/or pilot transfer operations) are able to, and do, transit to the west of this line due to their draught (see REP1-077) and thus the wider area (as indicated by shallow draught pilot transfer area) is available for navigation which serves to reduce the pressure on the 'deep draught pilot transfer area'.

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			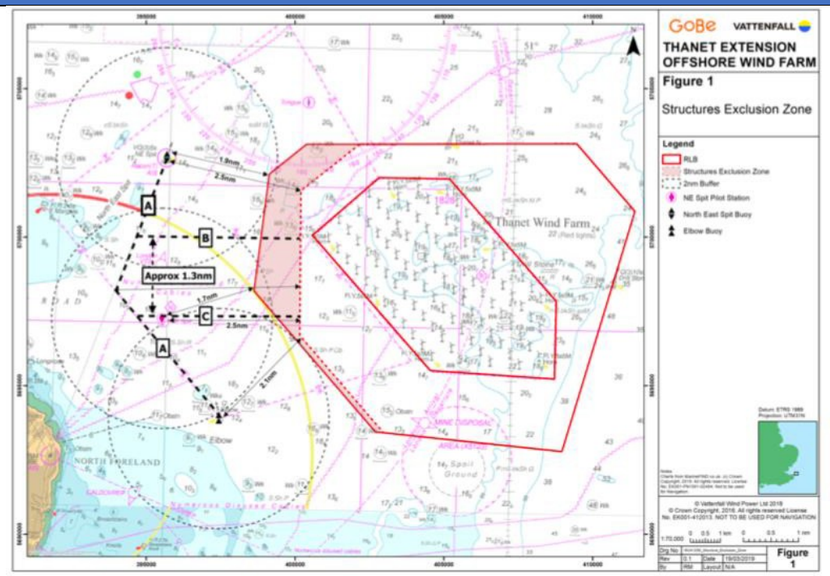 The 'additional shallow draft pilot transfer area' demonstrated in figure 5 would not be used for inward bound (taking a pilot) traffic unless in exceptional circumstances (e.g. Naval vessels will sometimes use this area in order to keep away from traffic to the south). Boarding in this area is generally considered too close to the approach that vessels make to the Princes Channel. It is good practice that the pilot is on board, in control and situationally aware before the vessel is in close proximity to the East Margate Buoy. Figure 6 indicates a 'deep draught pilot transfer area', however there is no specific deep draft vessel transfer area at the inner boarding station. Deeper draft vessels will be given a boarding position on the inshore route if possible depending on MetOcean conditions, state of tide and other traffic. This will typically be a position at least 1 nm east of the inner boarding position in the deeper water.	
	Section 7, para 54	Sea room between Elbow Buoy and SEZ	The sea room in between Elbow Buoy and the SEZ is still a navigationally complex area and the definition of 'least' complex is misleading. The Elbow buoy area is a vital part of ESL's area of operation that allows flexibility when trying to operate in adverse weather conditions as well as being incorporated into run planning during boarding and landing peak periods. It is important for the safety of navigation in adverse weather, and to enabling flexibility in the planning of operations during such conditions. 238 vessels were served by ESL in the area of the Elbow in 2018. One third of the boardings and landings in this area took place during or adjacent to periods when ESL was operating a restricted service and the Sunk pilot station was either off station or restricted. The remaining two thirds of	The context of the complexity statement in Para 54 is that the area between Elbow Buoy and the SEZ is the least complexity of the reference locations that were agreed with IPs at the workshop on 27-Feb-2019. It is noteworthy that the premise of 2nm of distance at this location has been accepted by LPC in ISH8 (and proposed it in their own submission). The Applicant further notes that the sea room widens out significantly to the immediate north and south of this reference location and does not consider that the SEZ prevents the comparatively low number of continued operations in the vicinity of this location.

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			vessels using the area of the Elbow would have done so as a result either of the MetOcean conditions, or due to traffic considerations. Operations which took place when the Sunk pilot station was off station or restricted almost certainly took place in the vicinity of the Elbow as a direct result of adverse sea conditions which restricted or prohibited ESL's service and the use of the Sunk pilot station. If the Elbow had not been available as the reserve option for pilotage services, it is likely that ESL would not have been able to offer pilotage services at these times. This would have caused significant disruption to these vessels, which included container ships for London Gateway and Port of Tilbury and tankers for Grays, Shell, Navigator, West Thurrock and Oikos oil terminals. It would also have had a knock-on impact to subsequent vessels due at these berths. If the proposed development goes ahead, the use of the Elbow will be restricted or inhibited, which will increase the times that pilotage services are unavailable and, in turn, decrease the commercial attractiveness of these ports and terminals. The effect of that would be to reduce the employment and economic opportunities offered by the pilotage services, ports and terminals.	The latter points on commercial impacts are already addressed in D5 IP responses (Annex A and C to Appendix 26 of Deadline 6)
	Section 8	Sea room between Tongue Pilot Station and SEZ	ESL and the PLA still consider that the Tongue DWD diamond will have to be relocated further NNE because the proposed 1.2nm sea room, with no buffer, will be too close to the extended wind farm boundary. The PLA and ESL also maintain their position that this station could become busier due to the potential for traffic to divert around the eastern side of the wind farm and avoid the inshore route. This would be even more likely for larger vessels. An increase in traffic at the Tongue Deep Water Diamond, particularly larger vessels, would mean the boarding position would have to be moved to a more precautionary site, which the PLA and ESL believe would need to be approximately 2.4nm NNE of its current position. This will keep boarding and landing at a safe distance from the Tongue anchorage and the northern boundary of the extension, but will inevitably increase passage time and running costs to ESL and pilotage.	The Applicant refers to ExQ3.12.7 at Appendix 22 to Deadline 6.
	Section 9	Conclusions	The PLA and ESL have concerns over the approach the Applicant has taken when considering sea room requirements. They do not consider that the assessment captures the use and importance of the route as a whole. Assessing individual points along the route (Elbow to SEZ/NE Spit to SEZ/Inner boarding area) has not captured the importance that each area has to the next. As stated in our deadline 4C submissions (EN010084/para 2) the PLA and ESL do nt [*sic*] consider that the MSP guidance has been fully reviewed when assessing sea room particularly with regard to suitable safety buffers. Using The [*sic*] MSP guidance would result in a route/lane (including safety buffer) of 5051m or 2.72nm as a baseline assumption, it is then suggested that additional factors are taken into account such as the area being used for boarding and	The Applicant notes this response and refers to the second response in this table in which a summary position is given on the Applicants approach to ensure a holistic understanding of the study area across the inshore area – drawing upon analysis at agreed reference locations and including the spatial and temporal modelling (by Marico Marine and Anatec Ltd). With regards to the comments on MSP guidance, the Applicant refers to the third response in this table and summarises by clarifying that the sea room as applied from MSP and MGN guidance allows for transits and turning vessels – both factors have been

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			landing, traffic crossing points. A precautionary approach would be to follow the MSP guidance for route width and safety buffer not, as the Applicant has done, follow purely the guidance for the route width.	included in a precautionary manner (to account for the variety of traffic interactions in this area) and a safety buffer of 1nm is also provided.
Document 2 (Review of the ES and Report to Inform Appropriate Assessment in relation to the Structures Exclusion Zone) and Document 3 (Revised Offshore Works Plan)			The PLA and ESL do not have any additional observations with regards to these documents.	The Applicant notes this response from PLA/ESL and confirm that no further Applicant response is necessary.
Document 4 Addendum to Navigation Risk Assessment (and associated annexes)	Para 22	Consideration of data sources for NRAA	In para 22 the Applicant refers to two tranches of AIS data (Dec- 2016 to Feb-2017 and Mar-2017 to Feb-2018) which were used for the pilotage and collision risk modelling studies. However, the original NRA states that collision Risk Modelling was undertaken using one month's AIS data from December 2016. In the PLA and ESL's view, this is not generally representative of traffic, as numerous vessels (e.g. leisure craft) do not carry AIS equipment, and December is one of the quietest months for vessel activity, particularly for boarding and landing and therefore activity around the inner boarding position. Collision risk modelling has not be re- evaluated for the NRAA, presumably due to time constraints. The underlying data on which they NRAA is produced is therefore flawed.	Further information has been provided by the Applicant on the data utilised and introduced during the examination and referenced to the data as provide in the pre-application. This is provided at REP4-030. Detailed narrative is provided on those vessels which are likely to be underrepresented in the AIS datasets and, notwithstanding this, the Applicant has carefully considered fishing and recreational traffic in the NRAA and thus considers these types to be representative in the overall assessment. The Applicant has sought to update collision risk modelling in relation to the SEZ, utilising an independent provider, Anatec Ltd, and thus this has been re-evaluated for the NRAA. The report is provided at Appendix 42 of this Deadline 6 submission together with a narrative on how this relates to the NRAA and earlier modelling undertaken by Marico Marine.
	Paras 65-66	Consideration of navigational use of the Elbow buoy area	These paragraphs illustrate that the Applicant has continued to underestimate the fact that this is an important area of operation for boarding and landing especially during periods of adverse MetOcean conditions, when other areas may be unusable. The Applicant's material change does not address the PLA and ESL's concerns about sea room at this area. ESL and the PLA would like to repeat the concerns raised at previous DCO hearings, in particular ISH8, that simply because there are fewer pilotage transfers in the area at the Elbow buoy, this area cannot be treated as less significant in terms of the sea room required.	The Applicant notes that the basis of sea room in the region of Elbow Buoy was accepted by LPC. Further detail is provided within the Applicants response to PLA and ESL's submission at Deadline 5 for ExA Action point 17 (Appendix 26 to this Deadline 6 submission). Further response is provided in Annex A to Appendix 26 with regards weather downtime of pilot stations by total pilotage days across the 9 regions/3 pilot stations
	Para 70	"As a result, a precautionary approach to defining the SEZ has been taken,	ESL and the PLA do not consider that this is a precautionary approach. The requested sea-room of 2 miles plus 1 mile buffer is not based on the number of vessels using the boarding and landing area. The applicant has assumed either that less sea- room is required for boarding and landing in this area, or that boarding and landing will no longer take place here. The Elbow is an	The Applicant notes this statement and maintains that a precautionary and considered approach has been undertaken with application of methodological guidance, data and consultation at each of the reference points which were agreed with IP's.

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		considering the relative complexity and quantity of marine activities in different areas of the inshore route."	important area for boarding and landing, which is essential to keeping the port open to all traffic during adverse weather.	With regards to the IP comments on Elbow, and its usage in relation to downtime and commercial drivers, the Applicant has provided detail in their response to PLA and ESL's submission at Deadline 5 for ExA Action point 17 (Appendix 26 to this Deadline 6 submission).
	Para 71	"The SEZ provides for the requested 2nm +1nm sea room in the area of highest density of pilot transfers which accounts for the complexity of traffic and adverse conditions."	The loss of flexibility of being able to use alternative areas to the north and south east of the inner boarding position means that during complex traffic situations and adverse conditions boarding and landing will be delayed, or will no longer take place. The SEZ has not adequately addressed the PLA and ESL's navigational safety concerns with reference to pilot boarding and landing. The reduction in ability to utilise these area fully will significantly impact of the pilotage services resilience.	The Applicant has provided detail in their response to PLA and ESL's submissions within Appendix 26 to this Deadline 6 submission).
	Para 73	"Due to the introduction of the SEZ north of the Elbow buoy, the restriction between it and the SEZ, where the majority of traffic is transiting through, is an isolated point between much wider sea room to the north and south. The line of sight for vessels entering the inshore route from the south has been vastly improved as a result of the SEZ meaning there is not the same 'channelisation' of this area of sea and it remains fully	The Elbow is central to ESL's boarding and landing activities in adverse weather conditions; the proposed extension of the wind farm will have a detrimental impact on ESL's ability to provide pilotage operations in such conditions. Furthermore, although this area may remain open for vessels, the narrowing of the channel is likely to make it unattractive to larger vessels for transit boarding and landing. In the PLA and ESL's experience, they would expect masters of larger ships, when faced with the narrower channel created by the proposed extension of the wind farm, to avoid the area rather than risk transiting through a channel that is narrower and busier than it is currently. The Elbow buoy area has significant operational value to ESL, as this area is fully incorporated into its working practices particularly during poor met ocean conditions. It can be, and has been, the case that this area is the only workable area sea room available.	The Applicant refers to the comments above in relation to the Elbow buoy and the sea room that exists in this location together with the submissions made at Appendix 26 of this Deadline 6 submission in relation to use of Elbow for weather and commercial drivers. The Applicant also considers that there is no evidence to support the statement 'likely to make it unattractive to larger vessels'. The basis of the area provided has been accepted by LPC for the vessels agreed likely to utilise the area and notes that there are other much narrower and busier areas through the vessels onward transits in/out the estuary. The Applicant also does not agree that the area at Elbow (and immediately north and south of this reference location) is lost as an area suitable for transfers.

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		open for the largest vessels to transit.		
	Para 111	Consideration of use of HAZMAN software	The Department for Transport's Port Marine Safety Code referenced in this paragraph does not mandate the use of HAZMAN software. Although the PLA acknowledges that it has in the past used HAZMAN software for risk assessments, industry experience has shown that it is not necessarily the most accurate method to assess future risk. The PLA is currently in the process of replacing its use of the HAZMAN software in favour of a system which is less complicated and allows for a more qualitative approach, in order to provide a truer and more reliable assessment of risk.	The Applicant can confirm that PLA's view on risk assessment software has been noted and responded to in Appendix 22 to this Deadline 6 submission. In brief the Applicant appreciates that PLA plans to transition away from Hazman II but would observe that at the time the PLA drafted and submitted their revised NRA at D4C, and subsequently discussed the outputs at ISH8 the methodology and guidance mandated by PLA was based on a simplified spreadsheet available on the PLA website. Whilst the high level landing page on the PLA website was edited to remove the link to the risk assessment template at some point after the 19th May the spreadsheet remains available at: https://www.pla.co.uk/assets/fm197plariskassessmenttemplate.xlsx and an abridged version is provided for ease of reference at Annex B to Appendix 22 of this Deadline 6 submission. The Applicant would also make the observation that the baseline likelihood and consequence scores, require user input and application of qualitative judgements and mariner experience, indeed the inherent likelihood and consequence scores also require user input to ensure qualitative inputs in addition to quantitative analysis is included. The Applicant would note in this context, as identified by the ExA at ISH8, that models such as Hazman or the PLA risk assessment template are as good as the data that are inputted; the data in this case represents a balance of the qualitative and quantitative. The Applicant notes that the Hazman II approach to risk management, which is also based on the IMO FSA, is entirely qualitative, follows almost exactly the format as presented in the PLA simplified methodology (except has the ability to input more detail), and fundamentally requires input of hazard likelihood and consequence scores defined by the users to generate a risk score.
	Para 121	Consideration of cargo tonnage data	The 'All Trade' figures for 2018 (including intra-port information) indicate that there has been a slight downward trend in ship arrivals over 2018 in particular. However, the ships that have been coming into the Port are getting bigger and so there has not been a downward shift in tonnage etc. coming into the Port. In addition, for the first 3 months of 2019 the PLA noted an 11% rise in the number of pilotage acts undertaken when compared with the same period in 2018, indicating an upward trend in vessel movements. ESL served 622 vessels over 199.9 loa in 2016 and 757 in 2018, an increase of approximately 21%.	The Applicant recognises PLA's assertion that vessel arrivals at the PLA have decreased, whilst vessel sizes have increased. The Applicant has provided a further response at Appendix 22 to this Deadline 6 submission with regards increases in pilotage but in summary notes that pilotage declined between 2016 and 2018, and any increase in a the first quarter 2019 does not necessarily mean that yearly frequency will increase (to the same extent) and that any increase serves only to result in neutral growth when considered in the medium term.

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	Para 123	Consideration of the "MMO1127: Futures analysis for the north east, north west, south east and south west marine plan areas" report, June 2017	In the MMO 1127 future analysis document table 85 (Section 13.4/page 307) under the local stewardship scenario it suggests 1% annual growth in tonnage between 2017 and 2036, it also assumes slower growth for international shipping but an increase in smaller coastal vessels and windfarm maintenance vessels with regional shipping routes likely to show a larger increase in density. The MMO future analysis would not appear to suggest the increase in freight will be handled by fewer but larger ships, it actually appears to support an increase in traffic on localised regional routes (such as the inshore route) and suggests an increase in smaller regional ports rate of growth.	Table 85 (the remainder of the table at page 308) identifies as the key assumptions that: • The trend for larger vessels would continue; and • Possible minor changes to shipping routes to accommodate offshore wind farms. Beyond this observation, the Applicant has provided further reference to future baseline considerations in response to ExQ3 at Appendix 22 to this Deadline 6 submission.
	Para 124	Consideration of the trends in recreational and fishing vessel activity in the area	The PLA and ESL do not agree with a long term projection of static/negative growth in the recreational sector. The RYA water sports participation survey 2017 does suggest a relatively small amount of growth in vessel ownership however it also recognises the South East as one of the highest use areas. It seems a broad assumption to relate national recreational boat ownership with localised recreational activity. Being an RYA survey it is also, we believe, based only on UK based survey participants and so presents a limited representation of views. The inshore route is frequently used by vessels crossing from the channel from Holland and Belgium who would not be considered by a study of domestic recreational sea users. It is also noted that NRA Section 6.3 (Summary of Future Traffic Profile) suggests a "steady increase" in recreational and fishing vessels although it is unclear if this is included in the 10% overall uplift by the applicant. The MMO future analysis document (section 11.4/table 67/page 228) also suggests potential growth for the fishing industry in the south east with regard to stock recovery over 20 years and the local stewardship scenario places emphasis on this growth having a positive impact on the 10m (and under) fleet specifically. The vast majority of fishing vessels operating around the inshore route and TOW are under 10m. We would suggest the national fleet numbers do not necessarily reflect regional fishing activity.	The Applicant understands ESL/PLA's position but would note that the RYA survey also provides for longer term trends. The modest growth referred to by ESL/PLA is 0.1% in 2017 for yacht racing, and the same for yacht cruising. The longer term analysis (2007 – 2017) puts this growth at 0%. The Applicant would also note that by far the busiest periods referenced in the survey referred to by ESL/PLA (50% of seasonal participation) is in the summer, which is defined as June-August. Given the study's particular focus on this aspect of recreational use it is relevant to observe that the MGN543 characterisation survey took place in the summer peak. The Applicant notes that Section 6.3 of the NRA does identify a "steady increase" in recreational and fishing vessels which was included in the original NRA hazard scoring, however further more detailed and up to date analysis presented in the NRA A does not show an increase and as such no increase was applied in the NRA A for fishing and recreational craft. With regards the reference to the MMO future analysis report the Applicant notes that reference has been made to the local stewardship scenario. The Applicant notes that this scenario assumes the presence of the Thanet Extension OWF, and associated windfarm service vessels, in addition to the referenced increase in fishing. The Applicant welcomes PLA/ESL's reference to the increase in commercial fishing stock recovery, and notes that the report assumes "Stock recovery under Nature at Work scenario results in the highest level of landings of the three scenarios. The implementation of MPAs and windfarms affects where mobile demersal fishing can take place, reducing the spatial footprint of seabed abrasion pressure. This is most pronounced under Nature at Work, with the operation of the London Array and Thanet extension areas, as well as MPAs. The Applicant therefore considers the increase in fishing to be attributable in part to the construction of the Thanet Extension under the MMO's future analysis.

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	Para 125	Consideration of likely trend in Windfarm Service Vessels (WSVs)	The PLA and ESL consider that the estimate for WFSV traffic increase is highly conservative given the relative youth of the offshore wind industry. Recently the PLA and ESL have seen the London Array windfarm increase from 4 on site WFSVs to 18 because of a summer maintenance programme. This has included work at night which was not previously the case. Although currently TOW does not work at night, this could change in the future. The PLA and ESL also note that in the NRA/Section 7.3.2/Results (collision modelling) it tests a scenario of WFSVs doubling on site and not remaining static. The MMO future analysis document (section 13.4/table 85/page 307/308) suggests an increase in wind farm maintenance vessels under the Nature@Work and Local Stewardship categories. It is difficult to understand what the predicted increase in WFSVs would be for the construction period (Annex D to Appendix 31 of Deadline 5/page 17). If WFSVs are provisionally incorporated within commissioning vessels, this would mean an estimate of 7 vessels making a total of 480 trips over a 3 year period. This would give an average return of 160 trips per year across, potentially, 7 vessels. This appears very low given our experience of traffic volume during construction or high maintenance periods for offshore wind farms. The PLA and ESL would like to seek clarification from the applicant on this point.	The applicant notes that Additional WFSV for the TEOW are considered in the assessment of risk for inherent risk profile (i.e. risk scores with TEOW in place) and a corresponding uplift in hazard likelihood provided. The reference to WFSV CRM modelling was to inform the assessment of inherent risk, with the TEOW in place and the need to have additional vessels to service it. The Applicant is not aware of any future OWF that intends to operate WFSV out of the Port Ramsgate or within the TEOW study area, and therefore no future increases in 3rd party WFSV are anticipated for new offshore windfarms. The fluctuation in WFSV is common within any windfarm maintenance regime and is adequately provided for in incident data analysis which included the TOW in place, which informs the baseline assessment of risk. In terms of the Construction phase then vessel numbers are provided for within the NRA at Table 4 which is an extract form Volume 2, Chapter 1, Offshore PDS [6.2.1].
	Para 142	List of additional risk controls assessed to determine the residual of risk level	Enhanced Promulgation of information: The PLA and ESL believe this constitutes embedded mitigation. The issuing of NTMs is already in place, and they are still unsure of how this would be enhanced. It is also difficult to see the advantage of issuing the WFSVs passage plans as they will often take the same track toward the existing site. The PLA and ESL are unsure of how realistic it is to expect the applicants WFSVs to be able to adhere to the timings published in a passage plan given the need, we assume, for onsite vessels to have flexibility. It is also difficult to see how NTMs can reduce the issues of reduced sea room, the local operators will already be aware of the reduction in sea room and will be trying to operate within it. Shipping and Navigation Liaison Group ("SaNL Group"): Whilst the final structure of this group is to be determined and as such the PLA and ESL appreciate this is only an outline of the groups role in making recommendations for mitigation, they are still unsure of its overall effectiveness in helping reduce the issues caused by a physical reduction in sea room. Whilst it is agreed that a group of this sort is a good idea, the PLA and ESL do not think that it should be considered as a form of mitigation itself. Instead it should be viewed only as a tool for assessing issues and then trying to establish further mitigation in the future. ESL and the PLA also believe that any shipping related issues identified on the inshore route would result in third party management either by ESL, the PLA, MCA, Trinity House. Although the	The Applicant does not consider Enhanced Promulgation of Information to be an embedded risk control measures with details on the enhanced level of the risk control noted at para. 135 in which it is identified that "Enhanced information promulgated (e.g. at a greater level than that included in embedded risk control measure promulgation of Information, such as issuing Notices to Mariners, WFSV passage plans, maintenance programs, outputs of Shipping and Navigation Liaison Group, etc.) to: • Fishing vessels (linked to Fisheries Liaison and Co-existence Plan) • Recreational vessels (link to local yacht clubs) • Shipping vessels (linked to Shipping and Navigation Plan) The Applicant welcomes the PLA and ESL positive statement on the Shipping and Navigation Liaison Group being a "good idea". In relation to the reduced sea room comment then the Applicant notes that the better communication and liaison between stakeholder will improve vessel traffic disposition in the area and will lead to a reduction in navigation risk. The Applicant notes that the group provides a forum for the ventilating of navigation issues may possibly arise, and that as such, the group may advise the strengthening, changing, identification or new controls or indeed

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			group could theoretically advise on what mitigation could be introduced, it should not be regarded as mitigation in and of itself. Post Consent Monitoring: This could be a good information tool to inform the SaNL Group but it will be a retrospective tool for traffic analysis. Again, the PLA and ESL are unsure how effective this would be, particularly as it is assumed that this will probably be AIS based and, therefore, not cover all vessels. The smaller more at risk vessels are less likely to have AIS. The PLA and ESL do not believe that this can be considered as mitigation for reduced sea room. Aids to Navigation/Buoyage: The PLA and ESL would consider aids to navigation to be embedded mitigation because the two main buoys (Thanet North and Drill stone buoy are already in place) and will only require moving. Any additional buoyage would, it is assumed, be related to the construction phase and whilst aiding navigation will likely	the relaxing of existing controls, and the Applicant remains committed to working with IPs to ensure navigation safety is maintained. The Applicant notes the PLA / ESL view on Post Consent Monitoring, however it considers that this control measures allows for the update, refinement and or, if necessary, the improvement of other risk controls such as Enhanced Promulgation of Information or Relocation of Buoyage and as such provides for a net benefit that is not per say linked to the manner in which the benefit is gained. Therefore, the Applicant's view is that it is best to apply the effectiveness of this intelligence led risk control to the tool which provides it – i.e. Post Consent Monitoring, as opposed to having varying levels of effectiveness for the other controls. The Applicant notes the PLA / ESL comments on AIS and as the PLA does have radar coverage of the area (which would pick up small vessels that are not mandated to carry AIS – especially within the PLA VTS area of jurisdiction in the vicinity of the NE Spit RACON buoy) , the Applicant would be happy to include this data within this assessment if PLA were able / willing to provide it – this will alleviate any concerns on inclusion of non AIS carriage vessels in the monitoring. The Applicant notes that the Aids to Navigation / Buoyage risk control extends beyond any specific requirement for the relocation of the Thanet North and Drill Stone buoys, which will only be known following confirmation of the final layout of the TEOW and will be conducted in co-operation with Trinity House as the responsible organisation for the management of Aids to Navigation (who will consult with Stakeholders on any changes they mandate).
	Para 143	Consideration of the scoring of risk controls	Currently there have been no discussions regarding risk control effectiveness. The current review of risk control effectiveness is based upon the Applicant's weighting and the PLA's 2015 risk assessment (which was not reviewing the area with reduced sea room with TEOW in place). Whilst noting the benefit of liaison between relevant authorities and stakeholders the PLA and ESL do not agree with the risk mitigation scores, including that which has been attributed to the Shipping and Navigation Liaison Group. It has been given an effectiveness score of 30% against the likelihood of collisions and contacts. However, it is the implementation of any additional mitigation identified and implemented that will reduce the risk, rather than the existence of the Group itself, as explored above.	The Applicant notes that time did not permit for discussion on risk control effectiveness during the hazard workshop. As noted by the PLA the Applicant considered risk control effectiveness in relation to those effectiveness scored applied by the PLA to the NE Spit NRA. The Applicant considers the likelihood effectiveness only applied to the Shipping and Navigation Liaison Group in comparison to likelihood and consequence effectiveness's applied in the PLA 2015 risk controls and considers it to be conservative in its assessment. It is the Applicants view that the creation of the Group will help the dissemination and effectiveness of any risk control and as such mandates its medium level likelihood reduction which is significantly lower than reductions applied to PLA 2015 controls as evidenced with the NRA A at Table 19.

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	Para 145	Consideration of cost benefit analysis	The PLA and ESL have not seen a full cost benefit analysis and do not believe that one was contained in the original NRA	Cost benefit of is an optional stage of the IMO Formal Safety Assessment risk assessment methodology. Consideration of cost benefit was included in the discussion on additional risk controls not taken forward at Table 22 of the original NRA.
	Para 146	Consideration of results of hazard workshop	The PLA and ESL recognise that their concerns regarding broad groupings of vessels types in the NRA were reviewed and partially addressed. However after the workshop they still have concerns about the breakdown of hazard types. For example, a class 1 or 2 vessel in collision with any other vessel, rather than with another specific vessel type, remains too broad a category. In the original NRA the hazards logs were more specific but an awareness of the time pressures at the workshop lead to a broader approach. The PLA and ESL believed there would be a final presentation after the workshop which would be similar to that in the original NRA. It has become clear that the Applicant does not intend to produce such a presentation. It is noted that the scores have been updated following the changes made in response to the concerns raised by the PLA, ESL and other IPs, but the scores are still based on a different methodology to that used in the original NRA. For example, the methodology used at the workshop to assess consequence was not the same as that used for the original NRA. In the original NRA each hazard was scored for the total consequence. e.g. for a collision between two vessels the consequence was scored for the combined consequence to both vessels. However, at the workshop on 29th March the hazards were only scored for the consequence to one vessel. When assessing the likelihood of a collision for a Class 1 or 2 vessel, the most likely and worst credible consequences were assessed. The consequence to the Class 1 or 2 vessel was scored, but the score did not take into consideration the consequence to the vessel with which it collided. It was explained to workshop participants that the consequence to the other vessel would be scored in a separate hazard for the other vessel. However, this leads to an underscoring of the risk. For a collision between a Class 1 or 2 vessel and a fishing vessel the consequence to the Class 1 vessel is scored in one hazard and the consequence to the fishing vessel is scored in a separate hazard. Therefore the total consequence of the collision is split between two risk scores, giving a lower score for each than if they had been combined.	The Applicant firstly notes that Navigation Safety in the TEOW study area is the jurisdiction of the MCA, and that whilst the PLA is the Statutory Port Authority for the Thames Estuary they do not have any statutory jurisdiction for the study area. Also ESL are a commercial organisation (owned by PLA and Peel Ports Group) that also have no statutory function. The Applicant offered a Hazard workshop with the MCA during the pre-application phase, who declined the offer, and also conducted numerous meetings with the PLA / ESL on navigation risk and integrated them fully into the supporting studies, the results of which were fed into the assessment of risk. The approach for collision hazards in the NRAA was discussed at pre-hazard workshop meetings, agreed at the start of the workshop, is used by the PLA in the NE Spit 2015 risk assessment attended by MCA, Peel Ports and ESL, and has also been used in the Tilbury 2 NRA. Its use facilitated the IP request to have more vessel type categories, whilst maintaining total hazard numbers to manageable levels (noting that it was only possible within the hazards workshop to address 4 hazards with the IP's in attendance). Further the PLA are incorrect in their assertion that this methodology underscores consequence, it actually scores consequence specifically for the vessel that the hazard relates to – so cannot be said to underscore the consequence. Further, as a collision between two vessels is now considered as two hazards instead of one hazard there is a corresponding increase in the likelihood component of the risk – which is not halved as it relates only to one vessel. If the PLA is unhappy with the methodology provided, then it would reasonably have been expected that either at the pre-workshop meetings, following the issuing of the draft hazard identification log (2 days before the hazard workshop) or during the hazard log they would have noted their preference for different approach which could have been discussed and potentially adopted. Further as the PLA use this approach, and are conversant with risk assessment through their own statutory responsibilities, then the Applicant considered it an entirely appropriate approach that is consistent with PLA risk assessment policy.

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	Paras 152-154	Consideration of outcomes of hazard workshop	The PLA and ESL have remaining concerns about the collision risk assessment conclusions that the Applicant has drawn from the hazard workshop. In the original NRA the baseline collision likelihood was 1 in 6 years (NRA/section 7.3.2/page 80), within 10nm of the development. It is difficult to understand how the original NRA had an overall analysis of all collisions resulting in a baseline of 1 in 6 reduced to 1 in 4 (post collision modelling). The NRAA does not present the overall collision rate, just the rate for commercial vessels. This makes it difficult for the PLA and ESL to make an overall assessment of the effectiveness of the SEZ in dealing with their concerns about navigational safety. The risk assessment scores cannot be compared, not only because of the different hazard types, but because of the different methodologies utilised. The PLA 2015 risk assessment was scored on the overall consequences of a collision to both vessels, whereas the NRAA risk assessment was only scored for the outcome to one vessel.	The PLA are referring to the CRM modelling at NRA Section 7.3.2/ page 80, which relates to all vessel types, and correlating this the scores within the hazard workshop, that were specifically related to historical incidents notes within the wider TEOW study area. This was discussed extensively with the PLA and other IP's at the workshop, which meant that only four hazards were assessed. There can be no questions therefore of the validity of the baseline collision risk likelihood scores from the workshop. The CRM showed that there would (if no embedded or additional risk controls were put in place) of around approximately 50%. This was based on the PEIR Red Line Boundary, not the application Red Line Boundary, and further did not include the SEZ. Despite this, at the hazard workshop the inherent likelihood rate was doubled for Class 1 and 2 commercial vessels, from 1 in 36yrs for the baseline most likely to 1 in 18 for the inherent most likely (the same % change was applied to worst credible as well). This shows that despite the substantial change to RLB and introduction of the SEZ, both affording significantly more searoom than the original CRM assessed, a conservative and precautionary 50% reduction to likelihood was agreed and provided. The Applicant would note that the PLA and ESL statement "*The PLA 2015 risk assessment was scored on the overall consequences of a collision to both vessels"* is at odds with the hazard log which states Hazard ID #1 as "Collision during or preparing for Pilot boarding/landing operations" which seems to apply the hazard to only one vessel.
	Paras 158-160	Consideration of residual assessment of risk	These hazards are at the low end of ALARP as defined in the NRAA, but the PLA and ESL do not consider the collision risks to be at the low end of ALARP, due to the way in which they have been assessed and scored.	As noted above, the hazard identification process was agreed by the PLA and ESL as was scoring of hazard likelihood and consequence, which as the PLA and ESL point out are at the low end of the ALARP range. Further to this the scores are also closely aligned the PLA and ESL own rescoring of the hazards (which incidentally used the same hazard types) as submitted at Deadline 4C.
	Para 168	"The TEOW, depending on final turbine layout may require the relocation of the Tongue Pilot Diamond slightly further north (noting ESL pilot	The PLA and ESL consider that the Tongue Pilot Diamond <u>will</u> need to be relocated. However, the Applicant does not appear to have given consideration to an alternative position and the PLA and ESL have not be consulted in this regard. Further, the effects of relocation have not been risk assessed.	The requirement for relocation to Tongue Pilot Diamond has been considered, and it is considered that with the SEZ in place the TEOW is 0.7nm closer to the Tongue pilot boarding diamond that the current TOW (it is 1.9m from the existing TOW and 1.2m to the SEZ boundary). Therefore, depending on the final location of the TEOW WTG's within the SEZ boundary, the requirement and or extent of any relocation will be clear. As noted at in the Applicants response to ExQ3 (Appendix 22 to Deadline 6 submission) and IP Deadline 5 responses, a relocation of

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		boarding locations as presented in Section 2.)"		up to 0.7nm will not have any material effect on either the assessment of risk or economics of operating the station.
	Para 184	Consideration of risk controls	Paragraph 184 of the NRAA appears to undermine the principle of the SaNL Group. The Applicant appears to be declaring that the PLA/ESL are the primary navigation users so therefore any navigational issues should be resolved by them and the MCA. This would seem to suggest that the NRAA's conclusion that all risks have been reduced to ALARP means that any future navigational issues around TEOW are not as a result of the wind farm. If that was the intended meaning, the PLA and ESL cannot agree to this.	The statement at Paragraph 184, notes that the Shipping and Navigation Liaison Group could be a good vehicle to facilitate the recommendation of the NE Spit 2015 risk assessment that it be periodically updated, but that it is not the Applicants responsibility to further mitigate baseline risk (i.e. navigation risk without the TEOW in place) in the NE Spit area.
Document 5 An addendum to the ES assessing the SEZ proposal			The PLA and ESL do not have any additional observations with regards to this document.	The Applicant notes this and has no further comment to make.
Document 6 Review of Application Documents with regards to the Structures Exclusion Zone			The PLA and ESL do not have any additional observations with regards to this document.	The Applicant notes this and has no further comment to make.
Document 7 The consequences of the SEZ on assessment of the Outer Thames Estuary and Flamborough and Filey Coast SPAs			The PLA and ESL do not have any additional observations with regards to this document.	The Applicant notes this and has no further comment to make.
Document 8 Implications of the SEZ – Seascape, Landscape and Visual Effects			The PLA and ESL do not have any additional observations with regards to this document.	The Applicant notes this and has no further comment to make.

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Document 9 Implications of the SEZ – Seascape, Landscape and Visual Effects – Wirelines			The PLA and ESL do not have any additional observations with regards to this document.	The Applicant notes this and has no further comment to make.
Document 10 Structure Exclusion Zone, Onshore Heritage			The PLA and ESL do not have any additional observations with regards to this document.	The Applicant notes this and has no further comment to make.
Document 11 Assessment of the implications of the implementation of the Structures Exclusion Zone in relation to commercial fisheries			The PLA and ESL do not have any additional observations with regards to this document.	The Applicant notes this and has no further comment to make.
Document 12 Appendix 2 at Deadline 4C: Shipping & Navigation – Statement of Evidence	Paras 26-28	Consideration of seasonality of baseline data used in NRA	The additional data gathered since ISH5, was in the form of AIS or Succorfish data, which would not capture the increase in recreational vessels that occurs in the peak summer period of August. It therefore does not address the previous concerns expressed by the PLA and ESL in reference to seasonality.	The applicant has provided further detail within REP4-030 when a validation of data was undertaken. This is notwithstanding that the MGN543 vessel traffic survey data is considered compliant and was gathered in conjunction with additional RYA datasets and consultation with the RYA and Royal Temple Yacht Club. It is also noted that recreational data characterisation adequacy has been agreed with the RYA. The Applicant has concluded that the use of August data would make no material change to the characterisation of the receiving environment. Nevertheless, the additional information sourced within REP4-030 and the contributions by PLA and ESL in the workshop has been incorporated into the NRAA and in summary the Applicant does not consider seasonality to be adequately considered. Further detail to this query is provided in Appendix 26 to this Deadline 6 submission section titled 'Comments on Applicant's Appendix 2 submitted at Deadline 4C: Shipping and Navigation – Statement of Evidence'.
	Paras 33-34	Consideration of sea room distances	The 1 mile buffer requested by ESL and the PLA is in relation to boarding and landing operations specifically. Only having the 2 miles plus one mile buffer at	The Applicant has provided a response to this query in response to this point made by PLA and ESL at Deadline 5. This is within (Ref:

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		and buffer distances	the NE Spit area does not allow for the flexibility required by ESL to undertake transfers in the full range of MetOcean and traffic conditions that they would normally expect to encounter. The introduction of the SEZ, therefore, does not adequately address the sea room concerns of the PLA and ESL.	Appendix 26 to this Deadline 6 submission section titled 'Comments on Applicant's Appendix 2 submitted at Deadline 4C: Shipping and Navigation – Statement of Evidence')
	Para 36	Consideration of the application of MGN543 in calculating sea room	The maximum safe sea-room has been calculated by the Applicant based on a standard turning circle with an allowance for the pilot transfer time. This does not make any allowance for non- standard situations which may occur as a result of traffic conflicts of emergency scenarios, which is why the additional buffer zone of 1 mile is critical.	The Applicant has provided a response to this query in response to this point made by PLA and ESL at Deadline 5. This is within (Ref: Appendix 26 to this Deadline 6 submission section titled 'Comments on Applicant's Appendix 2 submitted at Deadline 4C: Shipping and Navigation – Statement of Evidence')
	Paras 56-60	Consideration of the Pilotage Simulation	The PLA and ESL do not consider the simulator study to be robust enough to prove feasibility. The study did not make any assessments beyond average working conditions (no adverse MetOcean conditions or emergency scenarios) and with no rule violations (the 'human factor' was not assessed). The total of 14 runs is not enough if the study is to provide sufficient weight to the conclusion that pilot boarding and landing is still feasible at the inner boarding position. There was no post study conversation between ESL and the applicant regarding our feedback. This has led to an assumption that ESL were in full agreement with the conclusions, even though they had not stated this to the applicant. A more detailed response on what ESL and PLA felt should be covered to aid the assessment will be provided in our deadline 6 response to ISH8 action point 20.	The Applicant has made extensive response to PLA and ESL's comments regarding the simulation throughout examination. The structure and approach was discussed with both parties prior to (to ensure the scope and objectives were clear, documented and agreed), during and post the navigation simulation with all documents shared for input and comment and thus the Applicant does not agree that opportunity was not provided for the participants to provide feedback or comment (on agreement or otherwise) on these materials and in particular, the reported conclusions which documented the washup meeting attended by all participants. Whilst the Applicant has made clear that the objective of the simulation was not to identify or test threshold or limit state metocean conditions, the Applicant does not accept that adverse metocean conditions were not assessed (wind strengths of 25kts were considered in respect to their 'challenging' nature as well as conditions of restricted visibility). Interactions with third party vessels was incorporated (see section 3.3.3 of the simulation report) and challenging operational scenarios such as language difficulties, ladder issues and incorrect lees were also considered. Human factors were assessed within the simulator through the inherent nature of this work, which sought to elicit the qualitative inputs from participants, and it is noted that 14 runs (containing 30 transfers of varying complexity) were completed to a run structure that was agreed with the participants at the time to have been adequate to demonstrate feasibility of the sea room. The Applicant does not understand why no input has been provided to the Examination by the participating PLA Pilots and the conclusions that they reached during the simulation and the washup session held at the end (noting in particular that no other PLA personnel or the LPC representative elected to observe or participate in the simulations).

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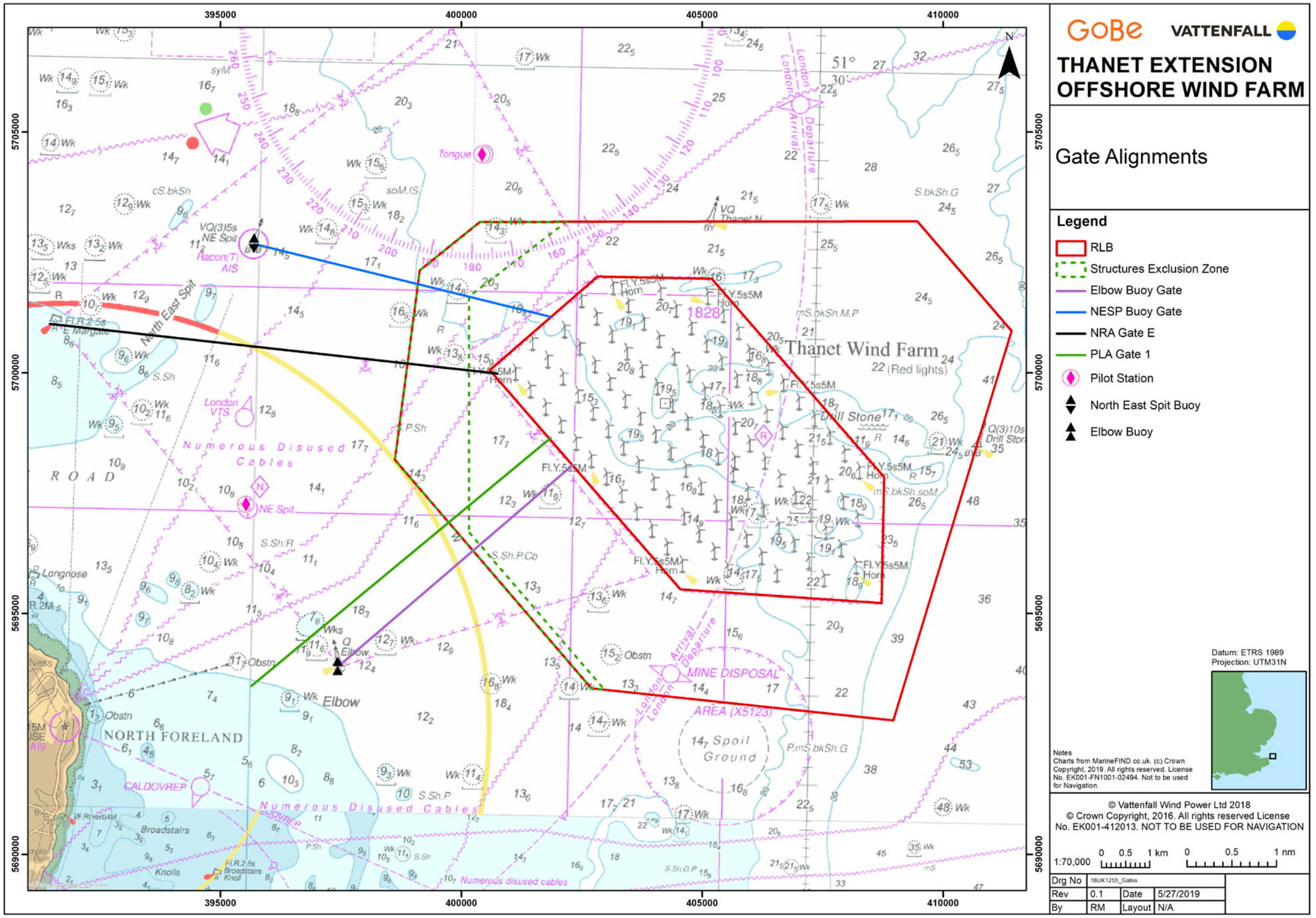
				The Applicant welcomes input from PLA and ESL on the scope of any future bridge navigation simulation work.
	Paras 61-65	Consideration of collision risk modelling	ESL and the PLA do not believe that a methodology used to assess river traffic by the PLA was the right approach for an offshore windfarm, and the Applicant did not discuss CRM with ESL or PLA before the NRA was published. The PLA and ESL do not agree that the figure presented in the CRM does not allow for human intervention. In the NRA (Section 7.3.1/Methodology) it states that a baseline assessment area was created for comparison, this baseline 'evidenced' an encounter correction factor of a third. Therefore a correction factor of a 0.33 has already been taken into account. The concerns of the PLA and ESL in relation to the CRM are not only in relation to the results. There is further concern that the CRM was based on one month's data for December in 2016, and that month was the lowest in a 12 month period in terms of the number of vessels using the NE Spit pilot stations; December is a quieter traffic month for the inner boarding position. CRM is an AIS based assessment which does not factor in the non-AIS vessels for assessment. There is a significant difference between the winter and summer traffic periods for non-AIS vessels, not captured by CRM. The PLA and ESL do not consider it is appropriate to assume the CRM results will automatically improve due to the introduction of the SEZ. Especially as there have been no discussions with IPs regarding any of the baseline assumptions underlying the CRM study (i.e. vessel domain shape and size, time period of study, nature of comparative baseline study area, how vessel track alterations were made during study for example).	With regards to the statement regarding the CRM methodology and prior to discussion with the PLA and ESL - this is incorrect. The Applicant notes the CRM, its methodology and applicability/suitability for this project was discussed at the meeting with PLA on 03 July 2017 which followed the issuing of the pilotage study report and discussion of the recommendations of that report (Ref Item 4 of minutes dated 03-Jul-2017 at REP1-007). Further discussion was held on this with ESL (ref minutes dated 14-Aug-17 at REP1-007) and explanation was provided within the simulation inception report about how CRM was being integrated into the overall approach. The CRM modelling conducted as part of the original NRA at section 7.3, used modelling tools developed in partnership with the PLA on domain encounter modelling – which was published in the Journal of Navigation by Andrew Rawson, Dr E Rogers and Commander David Phillips (Chief Harbour Master of the PLA at the time of the publication), and which enables domains to be designed to meet the requirements of the study area. That is why the domain parameters are presented at Figure 53 of the original NRA, which specifically relate to domains of vessels that transit at sea (and which incidentally are significantly more precautionary that the MSP guidance on sea room necessitates. The underlying methodology of domain analysis, which is commonly applied to coastal waters, is referenced to: • Goodwin, E. M. (1975). A statistical study of ship domains. The Journal of Navigation, 28, 328-344. • Pietrzykowski, Z. and Uriasz, J. (2009). The Ship Domain – A Criterion of Navigational Safety Assessment in an Open Sea Area. The Journal of Navigation, 62, 93-108. • Rawson, A. Rogers, E. Foster, D. Phillips, D. (2014). Practical Application of Domain Analysis: Port of London Case Study. Journal of Navigation, 67 (2). The human interaction correction factor of 0.33 (33%) was applied, is a very low factor and rates have been shown to vary between 33 – 90% depending on local conditions. At it would be expected for bridge teams to be on high alert when transiting to / from a pilot boarding area, or in coastal navigation the figure chose is considered to be very precautionary.

Consultation document	Document reference	Response summary/extract	PLA/ESL comments	Applicant regard
				The Applicant notes that the original collision risk domain analysis modelling undertaken by Marico Marine has been supplemented by an additional modelling study undertaken by Anatec Ltd and further information is provided on this within Appendix 42 to this Deadline 6 submission. Non-AIS traffic is a known and understood limitation of such CRM modelling, that is essentially more focused around areas of high density of these vessel types, which is typically close to shore (for example the recreational data supports this in the case of Thanet). However, this does not detract from the benefits CRM can give in terms of identifying relative changes in collision likelihood before and after vessel track changes resulting from developments such as offshore wind farms. CRM is a quantitative tool, specifically developed to ensure measurable and repeatable changes in collision likelihood or risk can be made, without reliance on qualitative judgement made by individuals with vested interests. It represents a tool to aid the overall assessment of risk within a methodology such as the FSA, which specifically allows for integration with qualitative input of stakeholders (as was undertaken) and provided value to both the original NRA (through the extensive consultation meetings) and within the hazard workshop and associated pre-meetings conducted for the NRAA.
	Addendum NRA and Risk Workshop		The PLA and ESL's opinion on the hazard workshop remains unchanged. The overall assessment was very time sensitive. There was not sufficient time to try and undertake such a detailed piece of work. We are in agreement with the MCA's submission at deadline 5 (ISH8 Action Point 10 response) that there should have been a thorough workshop conducted prior to application. The preferred approach of hazard identification by some IPs (e.g. to be assessing a hazard of a class 1 vessel in collision with another class 1 vessel, for example) was replaced by a broader, and more difficult to quantify category (e.g. a class 1 vessel in collision with any other vessel), the PLA and ESL believe that this was primarily introduced because of the reduced time factor. Four hazards were discussed during the workshop but the PLA and ESL do not consider that this resulted in a greater understanding of the scoring process, overall approach, or how the conclusion of ALARP was reached.	The Applicant notes that Navigation Safety in the TEOW study area is the jurisdiction of the MCA, and that the PLA whilst a Statutory Port Authority for the Thames Estuary do not have any statutory jurisdiction for the study area. ESL are a commercial organisation that also have no statutory function. The Applicant offered a Hazard workshop with the MCA, who declined to attend, and also conducted numerous meetings with the PLA on navigation risk, which were fed into the assessment of risk. The approach for collision hazards was discussed at pre-hazard workshop meetings, agreed at the start of the workshop, is used by the PLA in the NE Spit 2015 risk assessment attended by MCA, Peel Ports and ESL, and has also be used in the Tilbury 2 NRA. Its use facilitated the IP request to have more vessel type categories, whilst maintaining total hazard numbers to manageable levels (noting that it was only possible within the hazards workshop to address 4 hazards with the IP's in attendance). The ALARP judgement for hazards has been explained in the NRAA.

Consultation document	Document reference	Response summary/extract	PLA/ESL comments	Applicant regard
	Para 110	Consideration of post consent monitoring	The PLA and ESL do not understand the Applicant's position that they do not regard post consent monitoring as necessary. If this is the case then the PLA and ESL consider that the Applicant should not attribute weight to it as mitigation because they only consider it to be an assessment of NRA validation.	The Applicant has committed to monitoring both during and post-construction. This is secured in the Applicant's dDCO which accompanies this Deadline 6 submission (Appendix 49). Monitoring is both a form of validation and a way of ensuring other mitigation measures are operating efficiently. In this regard weighting could either be placed uniformly across relevant risk control measures for which monitoring is applicable, or a low weighting simply applied to monitoring. The Applicant considers the latter to be most the transparent way of incorporating acceptable weighting to secured measures and monitoring.



GoBe VATTENFALL

THANET EXTENSION OFFSHORE WIND FARM

Gate Alignments

Legend

- RLB
- Structures Exclusion Zone
- Elbow Buoy Gate
- NESP Buoy Gate
- NRA Gate E
- PLA Gate 1
- Pilot Station
- North East Spit Buoy
- Elbow Buoy

Datum: ETRS 1989
Projection: UTM31N

Notes
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1:70,000 0 0.5 1 km 0 0.5 1 nm

Drg No	16UK1255_Gates		
Rev	0.1	Date	5/27/2019
By	RM	Layout	N/A