

# **Vattenfall Wind Power Ltd**

## **Thanet Extension Offshore Wind Farm**

Annex A to Appendix 7 to Deadline 5 Submission:  
Response to ISH8 Action Point 16: Thanet  
Extension Structures Exclusion Zone Consented  
Works Clarification Note

Relevant Examination Deadline: 5

Submitted by Vattenfall Wind Power Ltd

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## Contents

1	Technical Note in relation to Thanet Extension Interface with SEZ. ....	4
1.1	Introduction.....	4
1.2	The Purpose of the Structures Exclusion Zone .....	4
1.3	SEZ Rationale.....	5
1.4	Overarching commitments in relation to the SEZ.....	5
	Transit .....	6
2	Construction Phase .....	7
2.2	Safety Zones .....	7
2.3	Anchor spreads and Jack up Barges associated with Turbine installation .....	7
2.4	Export Cable Installation .....	9
2.5	Inter Array Cable Installation .....	9
2.6	Environmental and Engineering Investigation .....	11
2.7	Other works during construction .....	11
3	Operation and Maintenance.....	13
3.1	O&M activities.....	13
3.2	Inter array cable replacement and repair .....	13
3.3	Export cable replacement and repair .....	14
3.4	WTGs major component replacement.....	14
3.5	Conclusion .....	14

# 1 Technical Note in relation to Thanet Extension Interface with SEZ.

## 1.1 Introduction

- 1 During the Examination phase of the Thanet Extension application concerns have been raised by shipping and navigation consultees with regards the available sea room. As a result of the concerns raised by consultees and following stakeholder workshops to define the necessary sea room the Applicant has made a revision to the project through the introduction of a Structures Exclusion Zone (SEZ). The SEZ seeks to ensure that adequate sea room remains to allow other marine operations, such as pilotage and general navigation, to continue with any effect associated with the proposed project being minimised.

## 1.2 The Purpose of the Structures Exclusion Zone

- 2 Following the introduction of the SEZ, and during Issue Specific Hearing (ISH) 8, clarification was requested from the Examining Authority and IPs as to what would be permitted within the SEZ. The Applicant confirmed at ISH8 and ISH9 that with the exception of above sea structures, which would include foundations for wind turbine generator structures, met masts, substation(s) and waverider buoys, all other activities would remain permitted. The ExA asked that a further clarification be provided in writing. This note therefore fulfils the request to provide the reasoning for proposing an SEZ rather than a change in Order Limits and identifies what activities may be carried out within the SEZ during the different project phases – namely the construction and operation phases, noting that the decommissioning phase is considered to be comparable with the works of the construction phase.

### 1.3 SEZ Rationale

- 3 The primary reasons for adopting an SEZ rather than a change to the Order Limits relates to the identified need to provide flexibility for sub sea surface works. In this context sub sea surface works are those works relating to cable installation, and temporary effects associated with anchor handling and 'spud can' deployment for jack up vessels. It is recognised that the SEZ bisects the proposed export cable corridor, and as such cables (inclusive of inter-array) will be required to cross the SEZ at this location, in addition to inter-array cables potentially being required further to the north in the wider SEZ area. A RLB change would mean that there could be no development outwith the RLB, inclusive of associated jack up barge effects, and importantly the export cable/transmission assets. In order to therefore retain the ability to install the export cable and provide flexibility to install inter-array cables where micrositing around sensitive seabed receptors necessitates it, the Applicant has proposed to adopt an SEZ, whilst also firmly securing the commitment not to install any above sea surface structures within the DCO.
- 4 The utilisation of SEZs over RLB is well established in Nationally Significant Infrastructure Projects, with appropriate examples including the Rampion OWF, which introduced the SEZ during examination in order to reduce Seascape/Landscape effects in addition to minimising interaction with shipping and navigation interests at Shoreham Harbour. Further examples include East Anglia One OWF and Triton Knoll OWF. With regards the Rampion OWF project there was a firm commitment to not install foundations within the area, but all other consented activities (i.e. below sea surface and temporary effects) were permitted. This security was placed on the 'face' of the DCO, in much the same way as proposed for the Thanet Extension project.

### 1.4 Overarching commitments in relation to the SEZ

- 5 The Applicant has therefore conceded to reduce the area within the red-line boundary, within which fixed structures with the potential to impact on navigation (i.e. foundations/WTG) will be placed. Further to this the Applicant has committed not to have any part of the above sea infrastructure, including turbine blade oversail, encroach into the SEZ.

- 6 The decision to exclude over-sail means that each WTG foundation will be a minimum distance of half the rotor diameter from the edge of the SEZ. Whilst the Applicant notes that the prudent mariner, when passage planning, will offset approximately 0.5nm from the array this offset is on the basis of the fixed centre points of the WTGs as reported to the UKHO, and agreed with the MCA and Trinity House, during the detailed design/pre-construction phase. As such the Applicant's commitment to ensure no oversail of WTG blades within the SEZ will ensure further searoom is available; under the maximum (largest WTG) design scenario this equates to a further 110m.
- 7 In addition to the commitment to avoid oversail the Applicant has also committed to ensure that the mandatory 'operational phase' safety zone of 50m around the offshore foundation structure will also be fully within the SEZ.

## **Transit**

- 8 For general vessel transit to and from the work site including within the SEZ, it is not expected that any restrictions would be imposed on the Applicant or any other maritime parties, whose rights are protected by general rights of navigation and for whom the collision regulations would apply as normal. During the O&M phase vessels will transit the area on route to WTGs, no safety/exclusion zones will apply to these vessels at this stage beyond standard ColRegs.

## 2 Construction Phase

9 It is important to note that the construction phase has, to date, not been a focus of particular concern for Interested Parties (IPs), which is confirmed by the agreed focus of the hazard workshop which informed the Navigation Risk Assessment Addendum (a revised version of which accompanies this Deadline 5 submission at Appendix 28). Notwithstanding this, in line with the ISH8 Action Point the following sections provide a description of the proposed activities to be carried out within the SEZ during the construction phase.

### 2.2 Safety Zones

- 10 During the construction period, in line with the assessment presented in the Environmental statement and the Safety Zone Statement (Application ref 7.2) there will be a rolling advisory safety zone around construction vessels. It should be noted that it is common marine practice for vessels restricted in their ability to manoeuvre to issue navigational warnings requesting such clearance. As such a rolling advisory safety zone is not normally confined within the red line boundary of an offshore construction project and is in line with a stand-off distance that a vessel operating good navigational practices would in any event observe.
- 11 During construction activities the developer will also request a mandatory 500m safety zone around each offshore foundation structure. This mandatory safety zone is reduced to 50m after construction activities are finished (if applied for).
- 12 Thus during construction, the rolling advisory safety zone (which the developer would implement), and any mandatory safety zones associated with offshore foundation structures under construction, will potentially enter the SEZ, dependent on the final design. It is important to note that in practicality the rolling advisory safety zone is limited to the duration a vessel is passing, i.e. limited to the transient laying of a cable, or will be limited to a few days around a given foundation. These durations are therefore discrete in both temporal and spatial extents and considered to be in line with the stand-off distance that a vessel operating good navigational practices would in any event observe.

### 2.3 Anchor spreads and Jack up Barges associated with Turbine installation

- 13 Installation of foundations can be carried out by transporting the foundation on a transport barge or vessel and installed on site by a separate installation vessel or by transporting the foundations directly on a jack-up vessel or floating crane vessel.

- 14 In the case of a jack-up vessel, the jack up would typically be located within a 200m radius UXO certified area around the proposed foundation location. In this scenario therefore a jack up vessel would potentially be partially within the SEZ for the duration of foundation installation works. An additional advisory safety zone of 500m from the jack-up vessel is assumed, as presented in Section 2.2, and will extend into the SEZ.
- 15 For anchored foundation installation vessels, as noted in Application ref 6.2.1 (offshore project description) anchor spreads were assessed as occurring potentially outwith the RLB. Whilst this will no longer likely be the case around the SEZ, anchor spreads will extend into the SEZ from the vessel, with the distance dependent on anchor holding characteristics of the ground. The anchors would be marked by buoyage during the duration of foundation installation which may extend up to 5 days. During this period standard notifications and communications via VHF would be undertaken to ensure relevant information including vessel locations are promulgated. In line with the NRA A (Deadline 5) it is proposed for Thanet Extension to utilise a shipping liaison plan to enhance standard notifications and promulgation through regular and advance liaison with relevant stakeholders. This is in addition to the 'standard' Notice to Mariners as committed to as embedded mitigation and required in the DCO.
- 16 To aid in the contextualisation of the maximum duration in which an advisory safety zone may be in place during construction each foundation installation for WTG or met mast foundations is expected to take typically up to 5 days under a pin pile quadropod scenario.
- 17 The same requirement for a rolling advisory safety zone referenced for foundation vessels above applies for vessels involved in the installation of the met mast or the WTGs on the offshore foundations, whereby each turbine installation is expected to take typically up to 3 days.
- 18 Through reference to the indicative layout presented in Appendix 3 to Deadline 4B it is possible to identify that approximately up to 8 foundations and WTG installations may take place in proximity to the SEZ boundary and as such there may be up to 8 short term periods wherein the advisory Safety Zones associated with anchor handling and jack up vessels may extend into the SEZ. These would be discrete operations relating to one or two locations at any one time and would therefore not represent a 'buffer' around the project, but a very short term, location specific advisory zone.

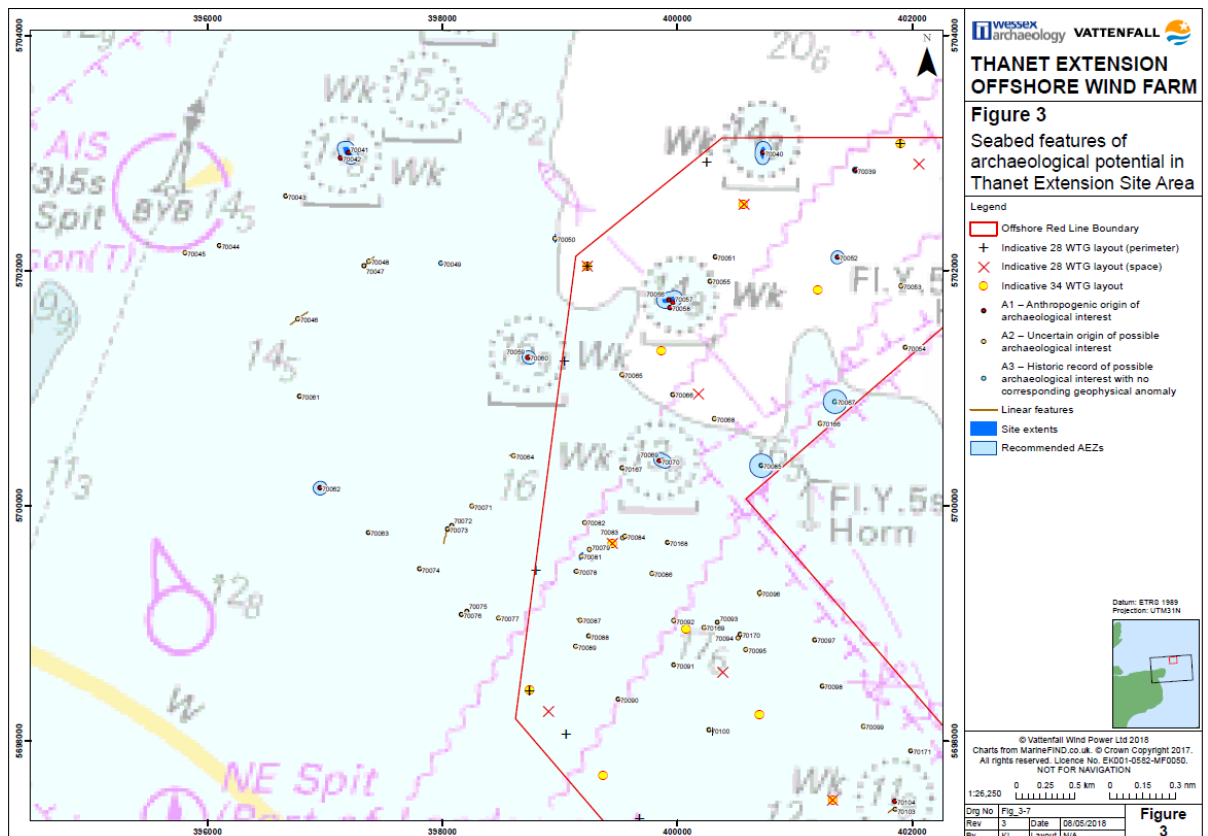


## 2.4 Export Cable Installation

- 19 The southernmost section of the SEZ effectively covers the entire width of the offshore export cable corridor and as such it is a certainty that export cable installation will need to take place in this area with supporting craft (anchor handlers) as necessary. It will therefore be necessary for the cable installation vessel to traverse this area and install the export cables. During this period advisory safety zones, as described in section 2.2, will apply to the cable installation vessel. It is important to note that the nature of cable installation is such that it will be carried out in a number of short, discrete, rolling phases. Initially seabed preparation will be undertaken to ensure the seabed is suitable for cable installation, followed by installation of the cable.
- 20 It is also important to note that there have been no concerns raised to date by other Interested Parties (IPs) with regards the proposed cable, or indeed the cables associated with the existing Thanet OWF which utilise a similar corridor, or the cables further to the north which are already installed within the seabed over which the SEZ is located.

## 2.5 Inter Array Cable Installation

- 21 At the current time, prior to completion of pre-construction surveys, it is not certain that adequate space exists between the innermost section of the SEZ boundary and the western most point of the existing windfarm boundary to allow installation of all array cables that may be required in this area. Sufficient space is required to allow micro-siting around archaeological features and the potential for ephemeral biogenic reef features. For example there is a wreck charted in close proximity to the narrowest section of the route and the potential for obstructions that would necessitate routing further to the west. (Reference Figure 3 – Wessex WSI – offshore).
- 22 The Applicant considers that whilst the overall design can be constrained to limit the number of inter-array cables in the north west region of the OWF, there will be a likely need for up to four inter-array cables to be installed. Assuming that some or all of these need to microsite around archaeological features or ephemeral biogenic reef features, there may be a need for up to four inter-array cables to be installed in the SEZ.



- 23 Cable installation in the SEZ would take as an indicative duration 1 day per cable. This would be quicker if cables are surface laid and slower progress is made during ploughing operations. If surface laid, a post-lay burial operation (PLIB) would be required and depending on the nature of the ground encountered could take 1.5 days per cable.
- 24 Only one cable installation vessel and/or PLIB would operate in the SEZ at any one time but for cable installation this vessel may be supported by anchor handlers.
- 25 The PLIB vessel would have a rolling safety zone of 500m as it progressed along the cable.
- 26 In the event that installed cable cannot be buried to target depth within the SEZ it may be necessary for cable protection to be applied. Any vessel installing such protection would request a 500m safety zone during operations.
- 27 The cable installation vessel would have an advisory 500m safety zone.
- 28 It is noted by the Applicant that Cable installation is generally not an activity that significantly hinders navigational passage of vessels in all but the most constrained areas of waters. This can be evidenced by the proliferation of cables installed within the Singapore straits and closer to home, within and across the Dover Straits.

## 2.6 Environmental and Engineering Investigation

- 29 In order to effectively engineer the cable routing further survey works will be required. This will inherently require limited works within the SEZ. Such survey works will include environmental grab sampling and drop down video to identify ephemeral biogenic reef features, non-intrusive side scan sonar, bathymetry, sub-bottom profiling and magnetometer surveys. Such works are relatively standard surveys which have minimal impact on shipping and navigation. An advisory rolling 500m safety zone would be requested by the vessel when conducting such operations.
- 30 Following a review of the survey findings and detailed cable route engineering, if it is determined that cable routing will be required within the SEZ then Cone Penetrometer Testing would take place as discrete locations along the cable route. Assuming a worst-case scenario of 8 tests, an indicative duration of 4 days should be allowed during which time, the vessel would again be advising that a 500m safety zone around the vessel be observed.
- 31 It should be noted that it is common marine practice for vessels restricted in their ability to manoeuvre (such as survey vessels) to issue navigational warnings requesting such clearance and such zone is not normally confined within the red line boundary of an offshore construction project.

## 2.7 Other works during construction

- 32 Whilst non cable related construction works will not themselves take place within the SEZ, there will be an interaction/interface due to a potential requirement for anchor patterns and construction safety zones that will be associated with other works and that will by necessity overlap with the SEZ.
- 33 Pre-construction surveys for foundation installation will take place similar to those referenced for cable installation above and with the addition of bore holes at each foundation location.
- 34 These surveys will be confined to areas outside of the SEZ however the 500m safety zone will extend into the SEZ during operations.

- 35 Following the surveys referenced above and in section 2.6, and on completion of detailed route engineering a more detailed assessment would be able to be presented to the authorities/stakeholders giving indicative programming, duration and extent of such works and safety zones which could be updated on a regular basis leading into the project construction.
- 36 If cable installation is required within the SEZ then further activities outlined below will also be required.
- 37 Pre-lay grapnel run, route clearance (UXO, obstructions, fishing gear, Out of Service (OOS) cables). Whilst it is noted that consent to clear UXO is not part of the final DCO the listed activities would take place prior to construction. Only one vessel would be operating within the SEZ at any one time and this vessel would have a 500m advisory safety zone.
- 38 It is understood that all existing cables located within the SEZ are out of service cables. Efforts are being made by the Applicant to locate the owners of these cables with the intention of obtaining agreement to cut and clear potential windfarm cable routes so that windfarm cables can be buried to the maximum extent possible. A number of these cable owners are thought to have gone into liquidation and as such the Applicant currently has no agreement/permissions to undertake this activity. In the event that it is determined that the Applicant has no legal rights to undertake such a clearance activity despite making all reasonable efforts to locate and notify the owners, it may be necessary to provide crossing engineering at any such locations. This would be in line with existing methodologies similar to those described within the project design statement with the possibility that pre-installation mattresses/rock placement may not be required.
- 39 Details of any required crossing locations would be determined after the detailed route engineering referenced above. Installation of crossings if required, are likely to take 0.5 day in each location and would have a 500m safety zone around the installation vessel.
- 40 Scour protection may be employed at foundation locations as further described in the PDS. Each operation at each location is expected to take up to 2 days. A 500m safety zone will apply which depending final location would extend into the SEZ.

## **3 Operation and Maintenance.**

### **3.1 O&M activities**

- 41 In general terms vessels will be transiting through the SEZ as part of standard maintenance activities. These vessels would primarily be characterised as crew transfer vessels. All vessels will observe the code of good vessel practice committed to in the project Fisheries Liaison and Coexistence Plan, which includes a commitment to ensure that transit is made at a suitable distance from active fishing vessels. Beyond this all vessels will be required to adhere to ColRegs which further ensures safety of passage of all other vessels during transit of the O&M vessels.
- 42 Most maintenance activities related to the foundations and WTG will not impact on the SEZ.
- 43 The exception to this is if major repair operations are required that involve the use of large jack-up vessels and/or diving operations, in which case 500m safety zones would be established for the duration of the operations for safety reasons. It must be reiterated that this falls within what would be the offset distance adopted by prudent mariner 0.5nm. Detail of frequency of these operations are in the sections below.

### **3.2 Inter array cable replacement and repair**

- 44 If cables are laid within the SEZ then there may be a requirement for survey and the possibility for reburial at some stages during the life of the Project.
- 45 It has been identified that as a worst-case scenario inter array cable could require up to 7 replacement of up to 2000m length during the entire lifetime of the wind farm. This would mean establishment of similar safety zone in the SEZ array as explained for inter-array cable installation during construction phase should failure occur at the limited number of inter-array cables installed in the SEZ.
- 46 It has been assessed that cable re-burial activities could take place once every 5 years during the lifetime of the wind farm. Cable repair could therefore also occur within the SEZ if failure within the SEZ occurs. Similar safety zones as for installation of the inter array cables would be expected in the SEZ during such maintenance operations.

### 3.3 Export cable replacement and repair

47 It has been identified that as a worst-case scenario that export cable could have up to one failure per 5 years involving repair of up to 300m length of cable. This would mean establishment of a similar safety zone in the SEZ as explained for export cable installation during construction phase, should failure occur to the small section of export cable installed in the narrow section of SEZ bisecting the offshore export cable corridor.

### 3.4 WTGs major component replacement

48 It has been estimated as worst case that up to 1 visit every 3 years for each turbine location could be carried out by a jack up vessel for major component replacement. Similar safety zone requirements as for installation of WTGs would be expected in the SEZ, with an overlap of the 500m rolling advisory safety zone, and any mandatory safety that may be applied to the WTG undergoing major component replacement.

### 3.5 Conclusion

49 From the information presented within this document it is clear that under limited, but project critical, circumstances cables (both export and inter-array) may need to be installed within the SEZ. The associated effects are predominantly limited to the construction phase, during which there will be transient rolling advisory safety zones in place around vessels, and infrequently during the operation phase should cable maintenance or repair be necessary.

50 It is also clear from the information presented within this document that during the construction phase there may be rolling advisory safety zones within the SEZ, and partial overlap of mandatory construction safety zones with the SEZ. These transient rolling advisory safety zones, and mandatory safety zones, will be limited to the duration of construction for any WTGs or metmast in proximity to the SEZ. They are therefore very limited spatially and temporally and are not considered to act as any greater hindrance to passing vessels than the imposition of any other vessel that may be present in the area or the 0.5nm prudent mariner buffer that would be observed from the structures. Whilst construction vessels would be cumulative with other passing vessels the duration is such that it would not result in a significant effect on safe passage or any other marine traffic operations.

- 51 It is also clear that the Applicant has gone beyond existing precedents, i.e. that of Triton Knoll or more recently Rampion, in committing to ensure that there will be no oversail of WTG blades with the SEZ. Given prudent mariners will utilise the physical centre point of a foundation as marked on charts from which to stand off, rather than the visual appearance of the WTG, and that the searoom calculations that informed the SEZ were based on the required distances between structures (i.e. centrepoinets, not visual appearance of blades) it is clear that the SEZ represents a significant and appropriately designed concession to the qualitative concerns raised by Interested Parties during the examination of Thanet Extension.
- 52 It can therefore be concluded that the limitation of above sea structures, including WTG oversail, from the SEZ is a sufficient constraint to address the qualitative concerns. It is not necessary to limit spatially and temporally discrete activities such as construction phase works as these are, by their nature, limited in time and location. It is also not necessary to limit cable installation works as these are characterised by temporally discrete activities that take place frequently within areas comparable to the inshore route, and indeed have done since construction of the Thanet OWF as is seen from the BritNed, and Nemo cables and perhaps more importantly the London Array export cable which bisected the route into the Thames further west of the proposed project. It is also of note that both BritNed and Nemo interconnectors had to be installed whilst bisecting some of the busiest traffic separation schemes in the world, with the former making landfall just south of Rotterdam which is the busiest port in Europe and one of the three busiest ports in the world.
- 53 It is clear therefore that temporally limited works such as cable installation are a frequent activity within busy areas of shipping and readily managed through appropriate communication, promulgation of information, and best practice management of vessels, all of which the Applicant has committed to undertaking and has appropriately secured in the DCO.