Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

Annex A to Appendix 1 to Deadline 6A Submission: Applicant's response to ExA's further requests for information under EPR Rule 17 – 4.12.7

Relevant Examination Deadline: 6A

Submitted by Vattenfall Wind Power Ltd

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Revision A

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Revision A	Original Document submitted to the Examining Authority
N/A	
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Comparison aspect criteria	Marico Marine	Anatec	Comparative comments
AIS Data used	1 month December 2016	1 month September 2017	Marico Marine undertook data benchmarking as reported in REP4-030 with regards to addressing questions of representativeness as raised during examination.
Site boundary	PEIR RLB	'Option A' considers the array area with the (post-PEIR) RLB and the introduction of the SEZ.	Option A was designed to mitigate the impacts of TEOWF on shipping and navigation receptors, therefore a reduction in collision risk (due to increased sea room) is to be expected.
Area modelled	PEIR RLB plus 5nm buffer	West of extension, aligned with area of stakeholder concern. Note that all AIS data within 7nm of Option A site was considered and deviated where necessary, however results were only presented for the smaller area to the west.	Area modelled by Anatec excludes dense traffic routes to the east of the site which are not displaced by the development of TEOWF.

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Data calibration	Marico calibrated their model to the baseline 1 in 6 year collision rate derived from AIS Data.	Anatec utilised a model calibrated against national historical incident rates leading to at least "material damage". These statistics were used to estimate the probability that an encounter situation ultimately leads to a collision. Baseline encounter rates are then determined via the input AIS data for the area, allowing collision frequency to be estimated.	Marico's assessment is locally calibrated. The approach uses change in encounters to show change in collision rate without assumption of consequence and is conservative in comparison with a threshold assuming material damage arises. Anatec's modelling process is site specific given the primary modelling input is the locally recorded AIS data. The wider (national) data set is used to predict the likelihood of a collision per encounter.
General method and key assumptions	1. Use of 2016 AIS data 2. Assumes larger vessels only diverted, smaller continue through wind farm. 3. Assumes 0.5nm plus CPA from extension. 4. Modelling was conducted on PEIR RLB 5. No uplift in traffic in modelling.	1. Use of 2017 AIS data and validated against a wider vessel routeing data set. 2. Assumes larger vessels only diverted, smaller continue through wind farm. 3. Assumes 1nm plus CPA from extension (as standard for Navigation Risk	Similar assumptions have been assumed with regards to deviation of vessels. Marico's model compares the change in encounters between the base case and future assessment. It should be noted that during the modelling

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	6. Encounter modelling basis: Marico CRM used a vessel domain of variable nose and fixed width based on individual vessel length (it also used time as a dimension). Therefore a 200m vessel (with manoeuvrability factor of 1) transiting at 10 knots would have a 400m buffer to the beam (sides) and stern, and a 620m nose forward (2x (1852*10/60)).	Assessments undertaken by Anatec). 4. 10% uplift in traffic (as standard for Navigation Risk Assessments undertaken by Anatec) - results in circa 20% increase in collision risk. 5. Anatec populate input grid with durations per vessel type, size, and course. These are used to estimate the number of encounters per cell split by encounter type (e.g. head on, crossing), which are then used to estimate collision frequency.	process, vessels are not given intelligence to avoid one another and therefore some of the encounters which result would not occur in reality and are introduced purely as part of the modelling process. This percentage increase is then applied to the baseline collision likelihood. Anatec's model calculates a collision return period based on when an encounter will become a collision. The likelihood of an encounter becoming a collision is based upon a national statistical data set and therefore accounts for human factors (for example) influencing the outcome of an encounter.
Projects used for/track record/recommended users	Marico Marine's model has been used within the PLA's SHA area through Central London Traffic Study, Thames Vision Capacity Stud and NSIP projects including the Garden Bridge NRA and Thames	Anatec's COLLRISK model has been used within Navigational Risk Assessments (NRA) for numerous consented offshore wind farm projects, including Rampion, Hornsea P1, Hornsea	Both models have been used and adopted in a variety of NRA's supporting NSIP projects and multiple sectors including offshore renewables.

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	Tideway Tunnel NRA. Other wind farm projects include St Brieuc Offshore Wind Farm NRA and a zone appraisal for NYSERDA off the coast of New York. Published in a peer reviewed journal - Rawson, Andrew, Rogers, Ed, Foster, David and Phillips, David (2014) Practical application of domain analysis: port of London case study. Journal of Navigation, 67 (2), 193-209. (doi:10.1017/S0373463313000684).	P2, East Anglia One, East Anglia Three, Galloper, Dogger Bank Creyke Beck and Teesside and Walney/Walney Extension as well as other offshore installations (i.e. oil and gas platforms) over a 15 year period. COLLRISK is referenced by International Oil and Gas Producers Association in the Risk Assessment Data Directory report for Vessel/Installation Collisions under "Best practice collision risk modelling for passing vessels".	Infrastructure developments and oil and gas.

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