Hornsea Project Four

Applicant's comments on NEO's comments received at Deadline 2

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Revision Summary

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1 Introduction

1.1.1.1 In line with the Rule 8 Letter (PD-007) and Examination Timetable outlined in Annex A of PD-007, stakeholders are invited to submit comments in relation to the submitted application documents and proposed project. At Deadline 2 there were submissions from 19 stakeholders, other than the Applicant, received by the Examining Authority.

1.1.1.2 The Applicant has reviewed and noted the content of all submissions and with this document provides comments on specific topics raised by NEO Energy in REP2-066.

2 Applicant's Comments to NEO Energy

Reference	Stakeholder's Written Representation	Applicant's Response
Deadline 2 Submission – NEO Energy: Aviation		
4.2 4.3	NEO relies on helicopter access to the Babbage platform for both routine operational matters and emergency evacuations, including search and rescue helicopter access. Helicopter visits are required in order to carry out essential maintenance work to ensure the safety of the asset and efficient operations and production. Alternative methods of accessing the platform such as the use of "walk to work" vessels would require capital modifications to the platform and result in increases in annual operating expenditure associated with chartering such vessels. This would also be a fundamental change to the current operating and maintenance philosophy and change to the Safety Case. The response times in the event of unplanned production shutdowns would be longer than were it possible to fly personnel to the platform and as a result there would be reductions in annual production. The combination of reduced production revenues, higher operating costs (therefore lower margins) and the need for capital investments could render the remaining production uneconomic and lead to an early cessation of production. Such an outcome would be contrary to MER UK.	Impacts on helicopter access to oil and gas platforms arising from Hornsea Four have been assessed within **A2.11 Infrastructure and Other Users (APP-023)**, Chapter 8: Aviation and Radar, noting that impact assessment was informed by overarching assessment to oil and gas operators in **A5.11.1 Offshore Installation Interfaces Part 1 (APP-086)** and dedicated assessment of helicopter access to the Babbage platform within Appendix A1 of **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)**. The assessment used seven years of meteorological data, from the nearby Ravenspurn North Platform, and applied the regulatory aviation limits, confirmed with the helicopter operators. The assessment indicates that there would be no significant effects on helicopter access during the construction, operation and maintenance, or decommissioning phases to the Babbage Platform on the grounds that it is unlikely that there will be any long periods of time when oil and gas platform helicopter operations are inhibited. Furthermore, the assessment showed there would be no impact on Search and Rescue (SAR) helicopter operations.
4.4	Ideally, the windfarm would be located at least 7 nautical miles from the Babbage platform. NEO is engaging with the Applicant regarding possible solutions to accommodate the Development. However, NEO wish to ensure that the minimum distance to the nearest turbine is sufficient to:	No rationale is provided for the distance of 7nm. In Appendix A1 of **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)** Section 3 assumes that a minimum of 9nm free from obstacles is required for an approach to the Babbage Platform, therefore 7nm will not provide any additional approach access. Section 3.8 and Tables 3.10 and 3.11 identify the take-off distances required in adverse weather.
4.4.1	ensure that the one engine inoperative ("OEI") manoeuvre can be safely executed using the industry standard procedures that SNS helicopter operators train and maintain, and	Following discussions with the helicopter operators, the source of the one engine inoperative performance graphs was changed from the AW 139 Flight Manual Supplement 97 to Supplement 50. The use of Supplement 97 had previously been agreed with the relevant helicopter operators during a joint workshop for Hornsea Project Three. In Appendix A1 of **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)**, Section 3.8 and Tables 3.10 and 3.11

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		identify the take-off distances required in adverse weather. The profiles applied in the analysis are certified by the aviation authorities, shown in the Manufacturer's Flight Manual and therefore safe to use.
4.4.2	that the number of flights to the asset is not substantially increased.	The assessment indicates that there would be no significant effects on helicopter access during the construction, operation and maintenance or decommissioning phases to the Babbage Platform on the grounds that it is unlikely that there will be any long periods of time when oil and gas platform helicopter operations are inhibited. This would present a minor impact on operations which is unlikely to lead to a significant increase in the number of flights.
4.5	To meet these requirements, a minimum distance of 7 nautical miles is generally required as per the industry standard. This distance differs to that presented by the Applicant in its Helicopter Access Report for the following reasons, as evidenced by the expert technical reports prepared in response to the Applicant and included as Appendices A and B to these written representations:	NEO does not provide a rationale for the distance of 7nm. Furthermore, it does not reference any "industry standard". The analysis in Appendix A and Appendix A1 of **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)** apply the current aviation regulations and industry best practice, previously agreed with the helicopter operators.
4.5.1	Use of Supplement 97 Enhanced Offshore Profile (a) The Applicant considers the use of the Supplement 97 Enhanced Offshore Profile to be valid for the Babbage Field. However, no operator in the UK SNS uses the enhanced profile as prescribed in Supplement 97 of the AW139 RFM.	Following discussions with the helicopter operators, the source of the one engine inoperative performance graphs was changed from the AW 139 Flight Manual Supplement 97 to Supplement 50. In Appendix A1 of **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)** Section 3.8 and Tables 3.10 and 3.11 identify the take-off distances required in adverse weather. The profiles applied in the analysis are certified by the aviation authorities, shown in the Manufacturer's Flight Manual and therefore safe to use.
4.5.1	(b) Similarly, the alternative one-engine inoperative (OEI) profile proposed would be a fundamentally different normal, and OEI, profile to the industry standard procedures that SNS operators train and maintain. NEO are aligned with helicopter operators in that NEO would be extremely reluctant to make a major change to offshore normal and emergency procedures, with the associated safety implications/considerations.	In Appendix A1 of **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)** Section 3.8 and Tables 3.10 and 3.11 identify the take-off distances required in adverse weather. Table 3.11 discusses an alternative procedure, which is certified for use. Flying procedures are frequently adapted and the Applicant would therefore contend that it is imperative to consider a certified, and therefore safe, alternative procedure which could be for the mutual benefit of both parties for the mutual benefit of both parties.
4.5.1	(c) NEO would therefore reject the use of this single path OEI profile, in favour of the currently practised 2 path OEI profile. Subsequently, the take-off and turn distances required from Babbage in Table 3.11 (pg. 34/35 of Platform Specific	**A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)** Appendix A1, Section 3.8 and Table 3.11 is certified by the aviation authorities, and therefore safe.

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	Data report) are not deemed acceptable for the Babbage Field and should be disregarded.	
4.5.2	Helicopter Payload Assumption resulting in Additional Flights (a) Table 3.10 (pg. 32/33 of Platform Specific Data report) considers a take-off and turn distance required from Babbage on the basis of a payload of 6,400 kg and 6.800 kg. (b) NEO consider that the payload basis of 6,400 kg is inappropriate as an assumption in this calculation as this would have an impact on risk and cost for the Babbage Field. (c) Helicopter weight at take-off from Norwich can be 7,000 kg, dropping to 6,800 kg for landing at Babbage (in line with the helideck weight limit) once fuel burned is accounted for. Therefore, conservatism is already being applied in the weight being used in the calculation by reducing helicopter weight assumption from 7,000 kg to 6,800 kg which NEO feel is a reasonable compromise.	In Appendix A1 of **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)**, Section 3.8 and Table 3.8 identify the conditions when a reduced take-off mass of 6,400kg would be required. Table 3.8 shows that for daylight conditions this varies between 0.5% and 2.0% each year for the seven years of meteorological data provided. The maximum take-off mass from the Babbage Helideck is 6,800 kg and so any discussion regarding 7,000 kg is not relevant.
4.5.2	(d) A further reduction in payload of 400 kg, reducing it from 6,800 kg to 6,400 kg, is significant as this is equivalent to a reduction in passenger numbers from approximately 12 to 8. (e) This would lead to a likely increase in the number of flights required each time the platform is manned and de-manned, and additional flights would add to the risks to which personnel are exposed. Although helicopters are a very safe mode of travel, they nevertheless constitute one of the riskier aspects of working offshore and accordingly NEO seeks to reduce rather than increase such risks. (f) Additional flights would also be likely to extend the duration of offshore trips due to the time involved in landing and take-off of an increased number of helicopters, which all has to be managed by the core crew trained in this specialist area. Additional flights would also result in an associated cost increase from a logistics and manning perspective	In Appendix A1 of **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)**, Section 3.8 and Table 3.8 identify the conditions when a reduced take-off mass of 6,400kg would be required. Table 3.8 shows that for daylight conditions this varies between 0.5% and 2.0% each year for the seven years of meteorological data provided. This would present a minor impact on operations which is unlikely to lead to a significant increase in the number of flights. The AW139 has been used in this assessment as it is the only helicopter type certified to carry 12 passengers and land on the small helideck fitted to Babbage. Impacts on helicopter access to oil and gas platforms arising from Hornsea Four have been assessed within **A2.8 Aviation and Radar (APP-020)**, noting that impact assessment was informed by overarching assessment to oil and gas operators in **A5.11.1 Offshore Installation Interfaces Part 1 (APP-086)** and dedicated assessment of helicopter access to the Babbage platform within Appendix A1 of **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)**. The assessment used seven years of meteorological data, from the

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		nearby Ravenspurn North Platform, and applied the regulatory aviation limits, confirmed with the helicopter operators. The assessment indicates that there would be no significant effects on helicopter access during the construction, operation and maintenance or decommissioning phases to the Babbage Platform on the grounds that it is unlikely that there will be any long periods of time when oil and gas platform helicopter operations are inhibited.
4.5.2	(g) In addition, as the Babbage platform does not have an automatic firefighting system fitted, the number of flights are limited to 120 landings per year in accordance with CAP 437 to reduce the exposure to risk. During current operations, NEO do not expect to reach this limit based on current operations, but this is an important requirement which drives the need to ensure that the number of flights to and from the platform is minimised, and therefore assuming additional flights will be required is not an acceptable basis for calculation.	The number of flights are limited to 120 a year when the deck is unmanned. In Appendix A1 of **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)**, Section 3 shows that Babbage is cyclically manned and so this limit on landing numbers does not apply when the platform is manned as the helideck crew can provide fire cover.
4.5.3	Path 2 OEI Climb Assumption (a) Table 3.10 (pg. 32/33 of Platform Specific Data report) considers a take-off and turn distance required from Babbage on the basis of a payload of 6,400 kg and 6.800 kg. (b) NEO contend that the Path 2 OEI climb from 200ft to 1000ft should be calculated at the mid-point of the climb (600 ft) to determine the average rate of climb over 800ft, and the full value of the 10 kt wind should be applied, as the graph has already factored the wind. This results in an increase to the calculated total distance required from 3.03 nm to 3.14 nm.	The midpoint at 600 ft has been applied to the calculation, see Table 3.10 Section D (pressure altitude = 600 ft) of **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)** Appendix A1. Factoring wind, that is to say only taking account of 50% of the value of the wind, is a conservative approach and results in slightly reduced performance. If the wind had been factored the take-off distance required would have been slightly longer. However, the windspeed applied in Tables 3.10 and 3.11, was 10 kts windspeed. The Rotorcraft Flight Manual has already factored those values (as stated by NEO).
4.5.4	Temperature assumption (a) The calculation has been performed using a temperature assumption of 20°C, whereas this was previously agreed in a workshop to be 30°C. Higher temperatures cause a reduction in the density of the air, resulting in lower aerodynamic performance. Additionally, higher temperatures result in reduced engine performance. The required distance increases by approximately 100 metres if the temperature assumption is 30°C as previously agreed. This would result in the overall required minimum distance being 3.20nm.	The Applicant hosted a workshop with the helicopter operators for Hornsea Three. At that workshop the helicopter operators agreed to apply Supplement 97. As the meteorological data available for Hornsea Three was limited, an extreme value of temperature was applied, i.e. 30ºC. As part of the discussions regarding Hornsea Four, where it was agreed to move to using Supplement 50, seven years of meteorological data on Ravenspurn North was made available, sampled at a 10-minute frequency. This wealth of data allowed a quantitative assessment of the temperature to be made, resulting in the calculations shown in Appendix A1 to **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)** Section 3.8.2. The data indicated that the

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		temperature in that offshore region will be 20ºC or lower for 97.5% of occasions.
4.6	In the Helicopter Access Report, the Applicant refers to the benefits of installing Limited Icing Protection Systems ("LIPS"). NEO believe this is of limited use and cost and payload implications are prohibitive, which is borne out by the fact that no airframe currently operating in the SNS has LIPS installed. The statements in the Helicopter Access Report (Section 8.2, clauses 99 and 100 (pg. 41)) are therefore not considered to be applicable to Babbage and such a system is not viewed as a solution which would increase the ability to fly to the asset in the presence of the windfarm.	The Access Report addresses a number of platforms. It is accepted that a Limited Ice Protection System is not relevant to the Babbage Platform.
4.7	The Helicopter Access Report is based on the assumption that the aircraft in use is the AW139 which is the best in class. In order to provide a rounded view, NEO believe that consideration should be given to aircraft types other than the AW139 as any report based solely on this airframe would likely provide insufficient safety margins for the use of other types which are required for flexibility in SNS operations.	Appendix A1 to **A5.11.1 Offshore Installation Interfaces Part 2 (APP-087)** Section 3.8 discussed this issue. The AW139 is currently the only helicopter type used for gas operations in the UK southern North Sea for helidecks similar in size and load classification as the Babbage. The AW139 is capable of transporting 12 passengers and bags as well as operations to 15D 5.3T helidecks, such as those on many NUIs or cyclically manned platforms. Over 1,000 AW139s have been built since the production line started in 2002, and the type has gone through a series of upgrades, including a recent avionic update. Previously, other medium sized helicopters were utilised on the southern North Sea, but these were retired after the Sumburgh helicopter accident in 2013. The accident resulted in the publication of CAP 1145 (CAA, 2014), CAP 1243 (CAA, 2015), and their associated Safety Directives. These resulted in legacy types, such as the S76 and EC155, being retired from the southern North Sea as they did not have crashworthy seating and fuel tanks and could not meet all the CAA requirements whilst still carrying an economic payload. Larger or heavier helicopters are not approved to land on the Babbage Helideck. Smaller types could be used, but those would require more flights, incurring the risk of exceeding the 120 flights per year: an issue already identified by NEO in 4.5.1 (g) of their submission. The AW139 has been used as it is the optimum, and currently only, helicopter type used for this operation.

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4.9	NEO would like to be clear that safety will never be compromised.	The Applicant fully endorses this stance. For this reason, aviation industry best practice has been applied to this assessment, along with the standard aviation regulations.
Deadline 2 Submission – NEO Energy: Shipping & Navigation		
5.1 & 5.1.1	ODE, as Duty Holder of the Babbage Field, have conducted a technical review of the Application and Environmental Statement in so far as it relates to shipping and navigation impacts relevant to Babbage. The findings of this report, included as Appendix C to these written representations, can be summarised as follows: 5.1.1 The key risk associated with the wind farm development is proximity and the Applicant has deemed this to be "Tolerable with Mitigation". In order to mitigate the risk: (a) Live monitoring equipment (AIS) will be required on the Babbage platform – the costs (supply, installation and maintenance) associated with this would require to be paid for by the Applicant;	**Volume A2, Chapter 11: Infrastructure and Other Users (APP-023)** considers the risks associated with the Hornsea Four development. Tables 11.23, 11.30 and 11.42 indicate that the assessed Proximity risks are Broadly Acceptable, not Tolerable with Mitigation. ODE's report refers to an earlier version of the Allision Technical Report. Further to refining the Order Limits and updating the NRA, the proximity risk was assessed to be Broadly Acceptable. A review of the change in vessel numbers passing in proximity to the Babbage installation as a result of Hornsea Four was carried out as part of the Allision Technical Report within **Volume 5, Annex 11.1: Offshore Installation Interfaces Part 2 (APP-087)**. This review estimates that the anticipated change in vessel numbers passing the Babbage platform is not significant with only one additional vessel per day passing within 2 nm of the platform. With respect to managing the allision risk for the Babbage platform, the duty holder is required to deploy an ERRV when the platform is manned to manage the risk associated with passing third party vessels. All ERRVs operating in the North Sea are already equipped with AIS to monitor traffic and therefore Orsted do not agree that additional mitigation is required over and above what the duty holder already has in place given the minimal change in vessel numbers and passing distances.
5.1.1	(b) Aids to Navigate ("AtoN") may be required by Trinity House. If so, Orsted will be responsible to arrange, install and maintain and the associated costs for such AtoN;	The Applicant is required to comply with any AtoN requirements as requested by Trinity House through the approval of a Lighting and Marking scheme and an Aids to Navigation Management Plan for the project. Trinity House requirements in this regard will include consideration of any existing structures already in place. Trinity House have been a key consultee throughout the Hornsea Four assessment process. (see project commitment Co93 as outlined in **A4.5.2 Commitments Register (APP-050)**).
5.1.1	(c) The Applicant should approach the relevant authorities, and any	The Applicant has consulted with the authorities of relevance to shipping and navigation impacts throughout the assessment process. This has included the

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	recommendations to mitigate the navigation risks to the Babbage platform including appropriate notifications, emergency response arrangements, etc, should be implemented and paid by the Applicant.	Maritime and Coastguard Agency and Trinity House, who are the only two statutory bodies that Orsted are required to consult with in relation to these issues (noting that extensive consultation has also been undertaken with non statutory consultees of relevance to shipping and navigation).
Deadline 2 Submission – Future Projects		
6.2	NEO are committed to investing in the asset to improve operational efficiency, reduce emissions and enhance production. The wind farm presents the following challenges which should be considered, these are longer term and of a more strategic nature, compared to the more immediate helicopter and marine aspects which have been the main focus of discussions with Orsted up to this point. 6.2.1 Decommissioning activities may be impacted in terms of logistics e.g. accessibility for platform removal & well P&A. 6.2.2 Near-field developments – development of any near-field targets may not be possible due to being unable to acquire further seismic data and/or being unable to access targets due to wind farm array 6.2.3 Third party tieback options could be reduced due to location of wind farm impeding pipeline routing for example. Non-disclosure agreements are in place with two third parties interested in producing via the Babbage and there are other potential field tieback opportunities identified in the area. 6.2.4 Wind farm could prevent future reuse of Babbage infrastructure e.g. for carbon capture & storage (CCS).	The Applicant does not consider that the presence of Hornsea Four will impact the decommissioning of the Babbage platform and associated infrastructure as the platform is some 2.4nm from the edge of the array and the associated infrastructure is located outside the Hornsea Four Order Limits. Potential future developments are assessed where the information is available in the public domain and there is sufficient level of certainty to carry out an assessment. The Applicant is not aware of any plans in relation to NEO Energy's points 6.2.2, 6.2.3 and 6.2.4. If any plans come forward, these will be considered in line with The Applicants assessment methodology.
Deadline 2 Submission – Protective Provisions		
7.1	NEO considers it necessary for the protection and continued safe operation of the Babbage Field that protective provisions be included within the DCO, and it has commenced discussion with Orsted as to the content and form of proposed protective provisions. It is NEO's position that these protective provisions are necessary and reasonable to avoid an adverse impact on and serious detriment to NEO's existing (and future) operations and to ensure that the Babbage Field can be operated safely and in compliance with all regulatory and licence obligations.	The Applicant has included Protective Provisions in the draft Development Consent Order submitted at Deadline 3