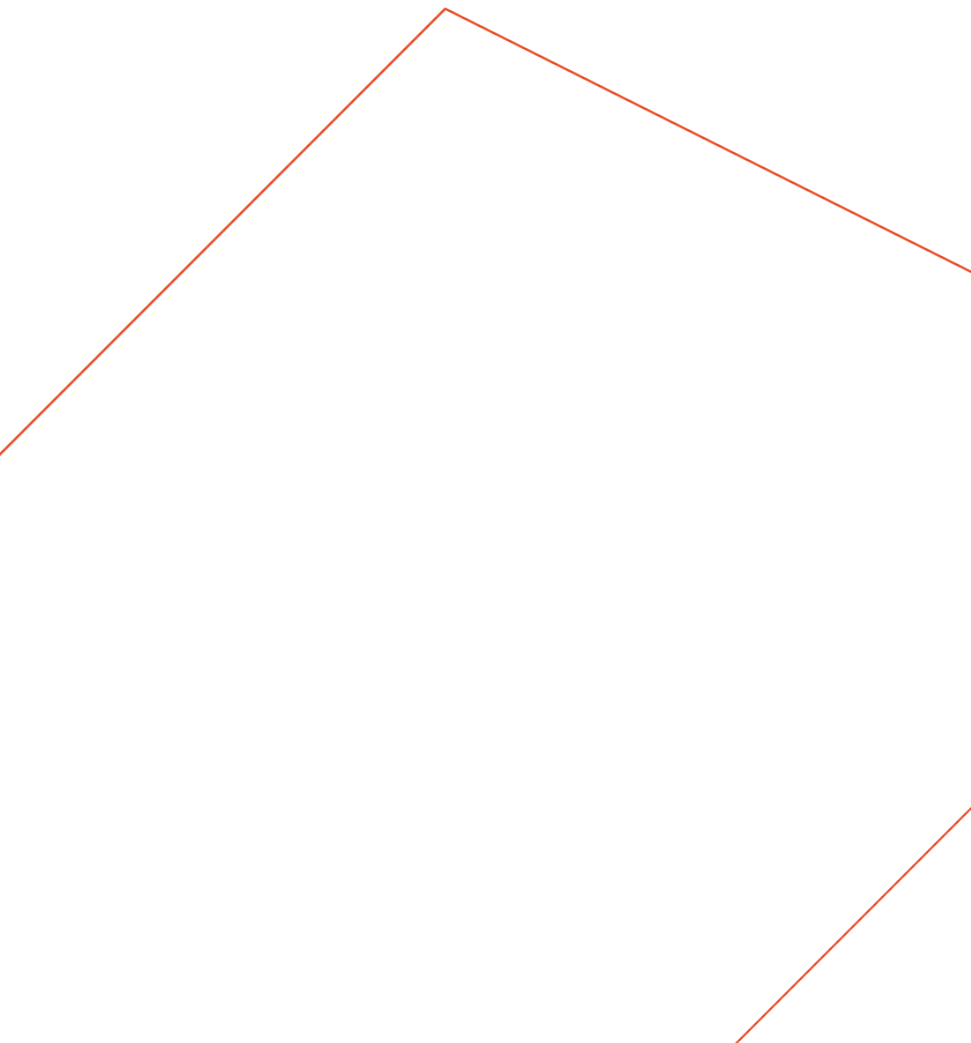




Hornsea Project 4 DCO Examination

Post-Deadline 8 Additional Information



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1.0 Introduction

The Applicant's Deadline 8 submission (REP8-015) asks for data to support Harbour Energy's position and makes several statements which require factual clarification. This document provides factual information to assist the Examining Authority in determining appropriate Protective Provisions to permit coexistence of the proposed Hornsea Project 4 windfarm development with pre-existing gas production activities at the Johnston Field.

2.0 Johnston Field Life

Since the publication of the "Prospectus" [REDACTED] [REDACTED] referenced by the Applicant, Harbour Energy has been realising synergies and investing to enhance many of the assets (including the Johnston Field) within its portfolio. A re-alignment of ownership in the infrastructure used by the Johnston Field has lowered tariffs and in 2022 investments in excess of £12million have already been sanctioned that will contribute to extending the life of the Johnston Field.

Trials are currently underway which it is anticipated will enable production to be obtained from wells that had previously had to be shut-in. If successful, these will further contribute to extending field life. A number of other projects are underway and further investments planned for 2022 and 2023 which would also contribute to extending field life.

Harbour Energy is legally obliged to maximise the economic recovery from the field. Cessation of production requires the explicit approval of the North Sea Transition Authority – acting on behalf of the Secretary of State (who in turn is under a legal obligation to ensure the maximisation of economic recovery from UK fields).

3.0 Helicopter Operations into Windfarms

3.1 Existing Operations

The Applicant cites a precedent of flights using AW139 aircraft and AW169 aircraft to helidecks within the Hornsea Project 1 and Hornsea Project 2 windfarms. Figure 1: shows the distances between the offshore substation Z12 within the Hornsea Project 1 windfarm array and the nearest wind turbine generators (WTGs)¹. Figure 2 shows the layout of wind turbine generators (WTGs) around the offshore substation (OSS) within the Hornsea Project 2 windfarm² upon which we have superimposed the distances to relevant WTGs as estimated from measurements on this diagram. The distances in each case are centre to centre. We understand that Hornsea Project 1 uses WTGs with 154m diameter rotors and Hornsea Project 2 uses 167m rotors. For reference the proposed maximum rotor diameter for Hornsea Project 4 is 305m³ (REP1-004).

¹ Source: [REDACTED]

² Source: [REDACTED]

(page 9)

³ Source: Environmental Statement, Volume A4, Chapter 4 (Page 28)

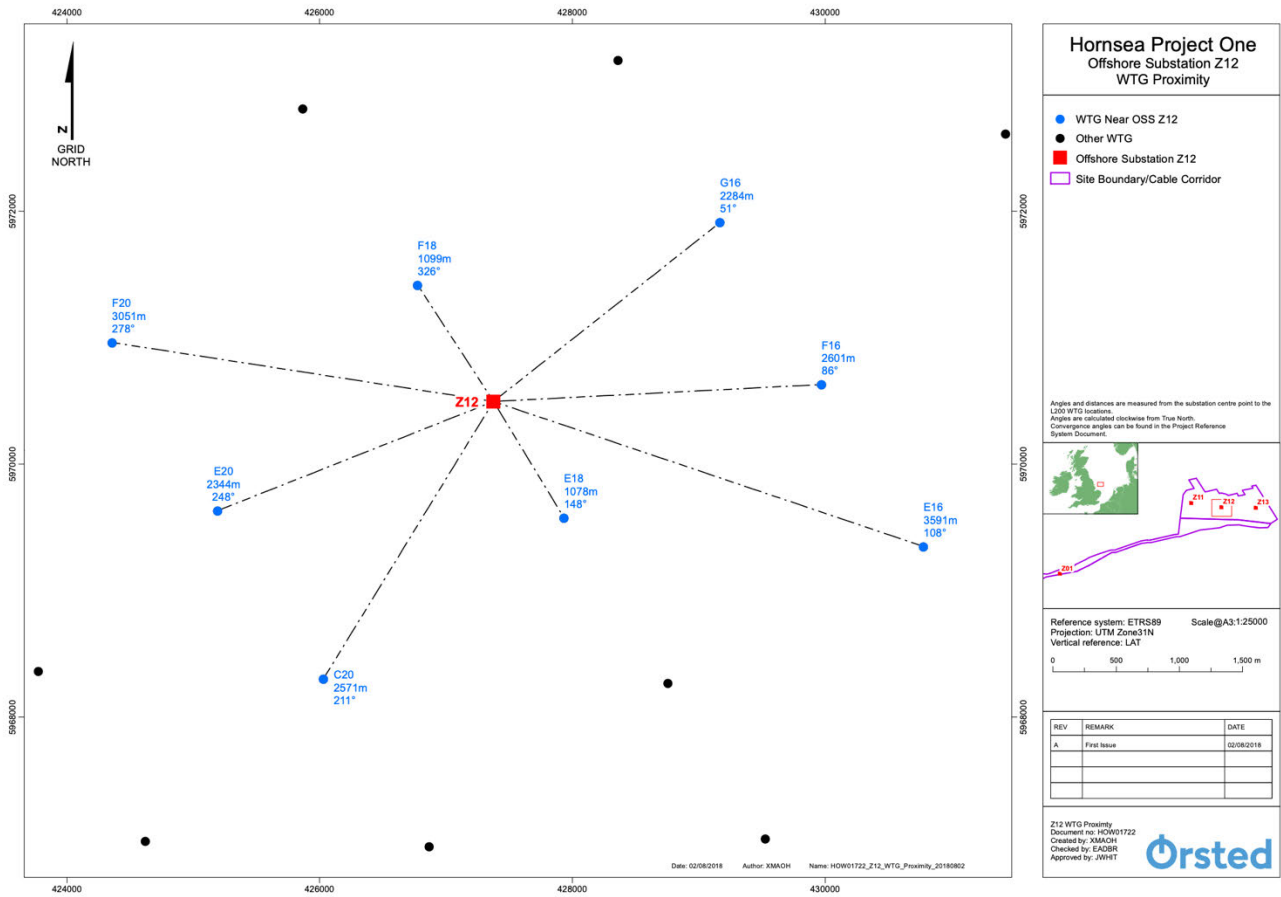


Figure 1: Turbine Proximity to Offshore Substation Z12

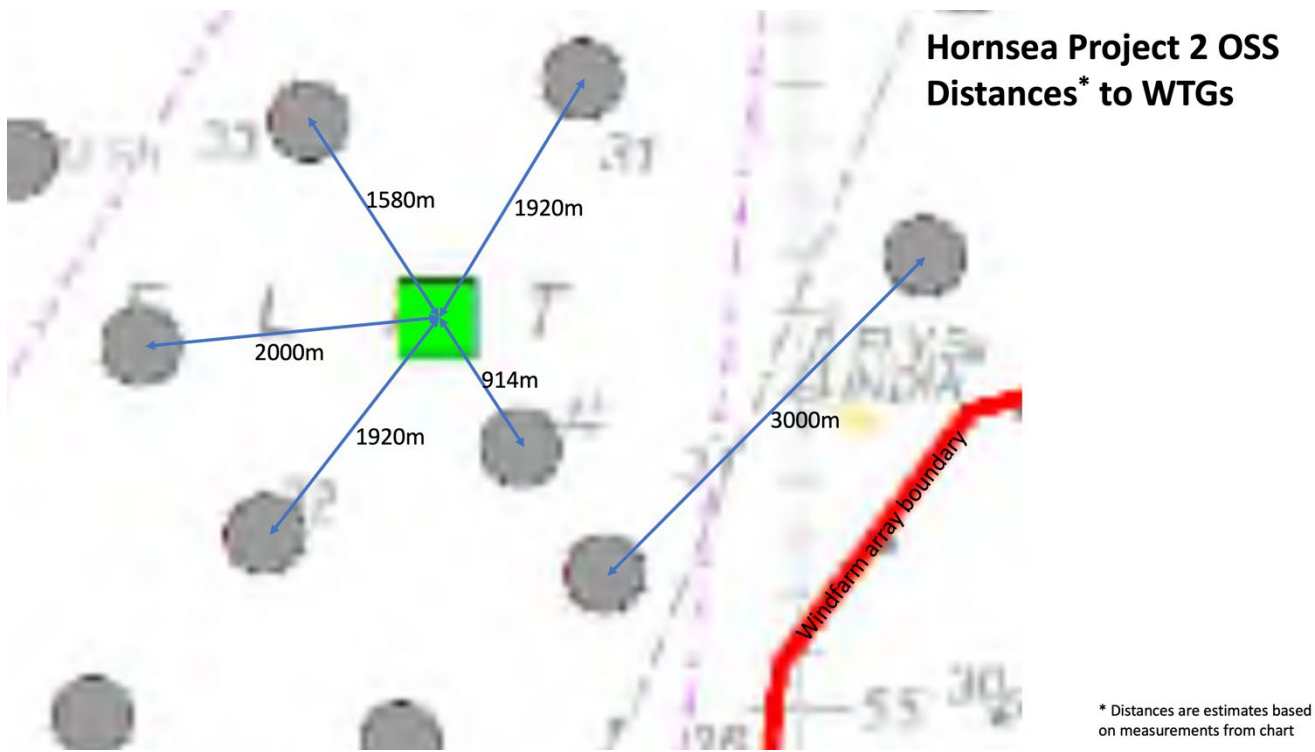


Figure 2: Turbine proximity to Hornsea 2 Offshore Substation

Unless rotors are stopped, this would mean that the available free airspace is reduced by the blade length(s). In both the case of Hornsea Project 1 and Hornsea Project 2 it is apparent that:

- (i) No turbine has been placed less than 914m from a helideck;
- (ii) Most neighbouring WTGs are at significantly greater distances (nearer to 2km) from the helideck;
- (iii) The Hornsea Project 2 OSS is close to the southeastern edge of the array, such that it can be accessed through a very short, wide (~3km) corridor through which there would always be visibility under Visual Meteorological Conditions.

Whilst Harbour Energy is seeking sufficient clear airspace in all directions around each of the two Johnston wellhead locations, it may be possible to operate flights with less space in some directions subject to Harbour Energy receiving compensation for flight disruption which takes account of the loss of flights when the wind is in directions requiring access from these restricted directions.

3.2 Sharing of Flights

The Applicant has proposed the sharing of flights provided by its own helicopter service provider. Whilst in principle this sounds like a simple solution, attempts to do this, even for occasional flights, in other parts of the UK have shown that in reality it is rarely practical. Each operator (the Applicant and Harbour Energy) is running time-critical operations. A helicopter operator's aircraft fleet size is optimised for the operations it supports. Spare capacity may be available for occasional flights but not to support a substantial ongoing rig programme. During a rig campaign, at least daily flights are required to the rig. It seems highly unlikely that the Applicant would enable Harbour Energy to take priority over its own operations in the use of its aircraft.

4.0 Impact of delays

4.1 Met-Ocean Conditions

Flight operations in the Southern North Sea are typically limited to occur between 06:00 and 22:00. This provides 5840 hours per year. Of these, 474 hours (8%) are unsuitable for flying due to the met-ocean conditions (this is similar to the Applicant's calculation of 6% being unsuitable). Of the hours suitable for flying whether or not a windfarm were present, 1,411 would not be in daylight – a loss of 26%. Due to the windfarm a minimum of VFR conditions are required, losing a further 145 hours. In fact, Harbour Energy's helicopter operators (and we would expect most others) place restrictions on the visibility and windspeeds within which they could operate close to wind turbines. This would lose a further 411 hours. By way of example, if flights could only operate under a limited set of wind directions (for example a 90 degree range to the SE), a further 2178 hours would be lost. As a result we conclude that a 6 month programme of rig operations could be delayed by 3-6 months. As set out in section 4.2, this could lead to additional costs of order tens of millions of £.

4.2 Cost of Delays

Figure 3 shows, public domain data on rig rates. The average cost of a rig fluctuates (taking into account exchange rate fluctuations too) between £140,000/day to in excess of £200,000/day. In addition to the cost of the rig, there are supporting services (e.g. the crew) which cost of order £80,000/day and fixed costs per well (which would not change, even if there were delays). This data has all been shared with the Applicant. Overall, a day's delay to the rig programme would typically cost of order £250,000.

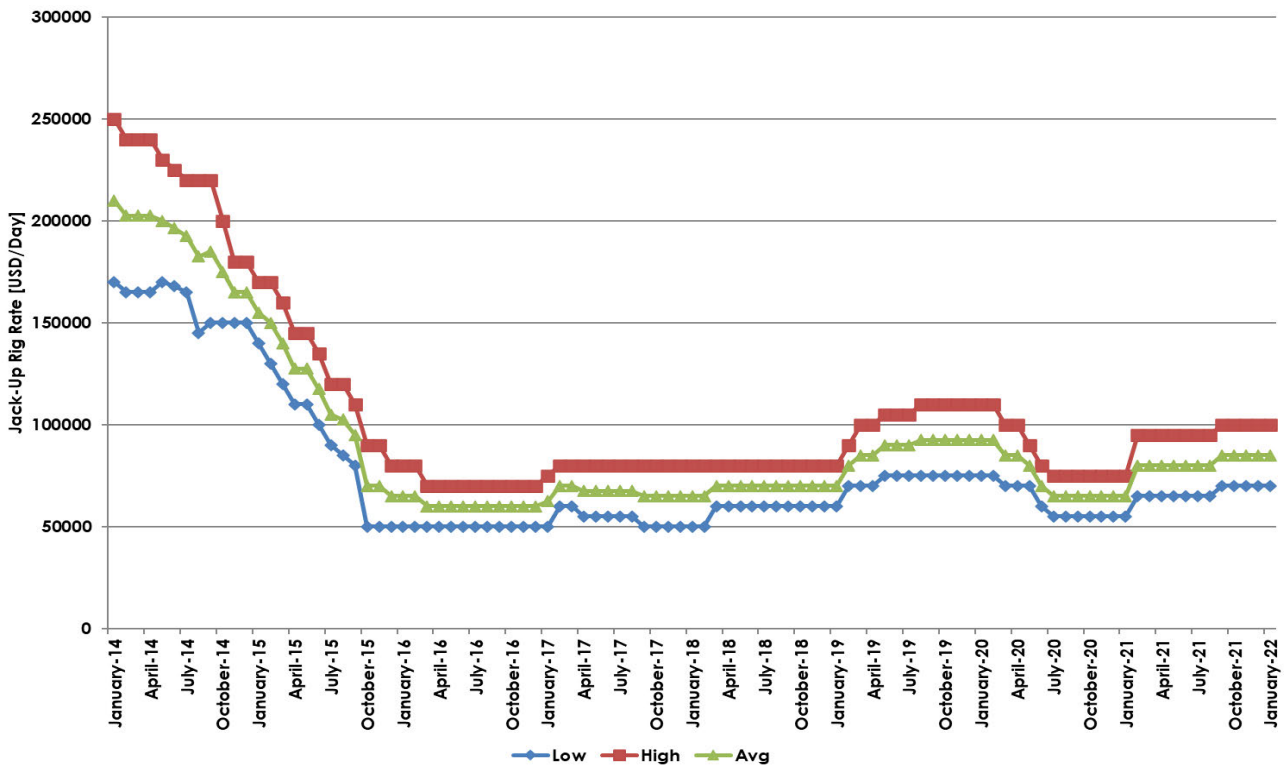


Figure 3: Public Domain Jack-up Rig Rates (Source: Clarksons Platou)

5.0 Conclusions

In terms of field life, it is highly likely that Johnstone production, and Johnstone Field decommissioning will overlap with the proposed Hornsea Project 4 windfarm operations. As such, Harbour Energy’s focus is on co-existence and we believe that the Applicant and the Examining Authority should maintain a similar focus. Substantial investments have already been made and continue to be made on the premise that Johnstone Field life will not be curtailed.

The Applicant’s comparison between their proposed Protective Provisions and the situation for operations to helidecks within the Hornsea Project 6 1 and Hornsea Project 2 windfarms is misleading in that the space available in each of these situations is significantly more than that proposed for Hornsea Project 4.

In terms of sharing of flights, experience has shown that this is impracticable, except in a small number of exceptional circumstances, most particularly due to competing priorities.

The main differences between the Applicant’s assessment of the impact of the proposed windfarm upon helicopter operations and Harbour Energy’s are:

- The applicant has assumed that almost all flights occur in daylight. This is not the case, especially in winter months.
- The applicant has not considered additional met-ocean constraints (over and above those required for VFR) which would be imposed by the presence of the windfarm and limited space for aviation operations.

Harbour Energy calculates that well in excess of 50% of flights could be lost, leading to commensurate delays to the rig programme.

Harbour Energy re-iterates that its existing proposed Protective Provisions (a 3nm radius around each wellhead in addition to the marine corridor) stand. These Protective Provisions would keep the Johnston Field outside of the proposed Hornsea Project 4 windfarm array and thus permit Johnston Field operations to continue with an acceptable degree of disruption.

Recognising the potential adverse impact of such Protective Provisions upon the Applicant, Harbour Energy is open to considering Protective Provisions that would be more restrictive to the Johnston Field subject to the resultant disruption to Johnston Field operations being compensated commensurate with the disruption experienced. Such disruption is likely to cost Harbour Energy in the range of £250,000/day and could involve additional costs of tens of millions of £. Harbour Energy suggests that appropriate solutions may involve one or more of:

- In order to operate flights to the Johnston Field, a minimum of a 1.6km obstacle free radius (in most directions) is required around each wellhead and aviation corridors with a minimum of 1.4km wide obstacle free airspace would be required to and from each wellhead. Such arrangements would result in significant delays to rig programmes and corresponding additional costs for which Harbour Energy would need to be compensated.
- Given the limited times during which simultaneous operations will be required, the Applicant could lock some wind turbine generators to increase the available airspace to provide the minima set out above.