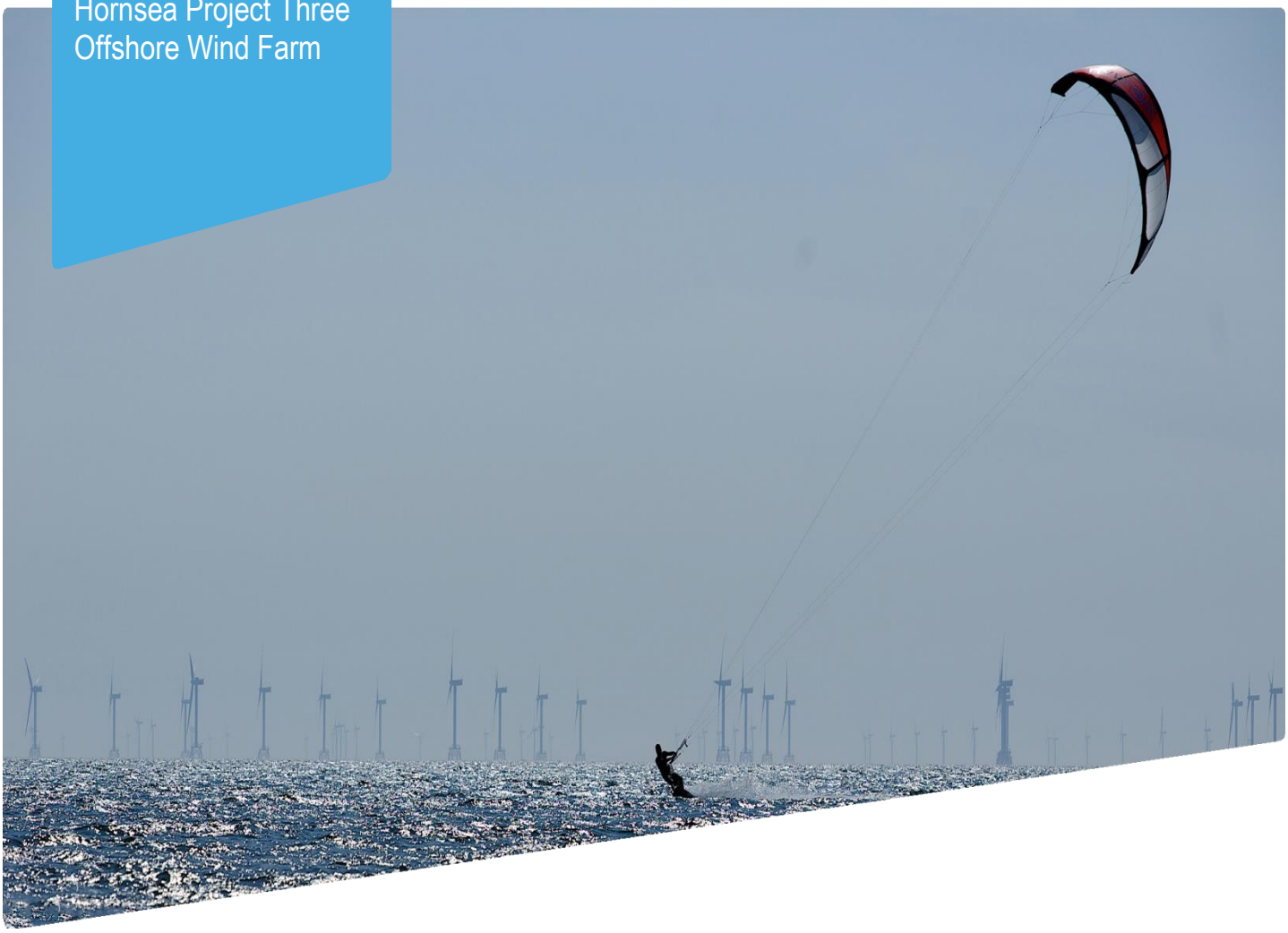
Hornsea Project Three
Offshore Wind Farm



Hornsea Project Three

Offshore Wind Farm

Appendix 1 to Deadline 9 submission – Applicant's response to Spirit Energy's submission at Deadline 7

Date: 26th March 2019

Hornsea 3
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Front cover picture: Kite surfer near a UK offshore wind farm © Orsted Hornsea Project Three (UK) Ltd., 2019.

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1. Introduction

1.1 This document presents a clarification of some of the issues raised by Spirit Energy at Deadline 7.

2. Clarifications

2.1 The clarifications are provided in Table 1 below.

Table 1: Clarifications of issues raised by Spirit Energy at Deadline 7

Reference	Issue	Clarification
2 Aviation Implications for Gas Exploitation by SE. P2, Paragraph 2.3.	Reduction in flying days	Spirit Energy assert a 66% reduction in flying days to the Chiswick Platform as a result of Hornsea Three. The Applicant disagrees with this even without a separation distance however in the spirit of coexistence the Applicant has provided a 2.8nm separation distance from the edge of the array to the Chiswick platform at Issue Specific Hearing 8 (and subsequently submitted by the Applicant as Appendix 35 at Deadline 7 (REP7-055)). With this separation distance, Spirit Energy's own calculations presented on p17 of their submission (REP7-093) shows that a 2.8 nm separation equates to a 9% (not 66%) reduction in flying days. The Applicant also notes that the Applicant and Spirit Energy have progressed discussions in regard to the assumptions and methodology used in the calculations of reduction in flying days which has been submitted as the Joint Positions statement at Appendix 25 to Deadline 9. These further discussions on the assumptions and methodology applied to the J6A met ocean data set have resulted in Spirit Energy revising their calculation of preclude flying days to 5%. Spirit Energy also assert a 90% reduction in flying days to C6 and C7. This does not reflect the offer (again in the spirit of coexistence) by the Applicant of a 1nm separation distance around the proposed wells).

Reference	Issue	Clarification
Paragraph 2.5	Spirit Energy's assertion that the CAA, advises in CAP 764 (paragraph 1.4(1)) that safety remains "paramount" notwithstanding the Government's EN-1 approach to provision of renewable energy provision, and the CAA requires a column of obstacle free air space be ensured around platforms so as to preserve safe gas exploitation and that CAA assumes the column radius to be at least 9 nm and its reduction is dependent upon an ALARP process	The Applicant asserts that this is an incorrect citation from CAP764. CAP 764 does state safety remains paramount however CAP 764 does not assume that a 9 nm column of obstacle free air space is required around platforms to preserve safe gas exploitation, nor does it state any reduction in 9 nm is dependent on an ALARP process. CAP 764 clearly states at paragraph 3.30 that "this consultation zone is not a prohibition on development within a 9 nm radius of offshore operations, but a trigger for consultation" and the Applicant has consulted with Spirit Energy in this regard. There is also no mention in CAP764 of the requirement to do ALARP.
P3, Paragraph 2.6	In regard to Spirit Energy's statement "Given the continuing need for helicopters to be able to perform an Airborne Radar approach (ARA) to the NUIs, and that alternative options such as a visual or "circling" approach from a downwind ARA are subject to weather and regulatory approval."	The Applicant advises that this statement is incorrect. A visual flight is of course approved (and always preferred). A Circling ARA is approved within EASA as confirmed by CHC, (the helicopter company currently under contract to Spirit Energy), and the helicopter operators during specific consultation on Hornsea Three during the Examination phase (Appendix 29 and Appendix 30 of the Applicants submission at D7; REP7-049, REP-050). All flights are subject to weather restrictions, including ARA.

Reference	Issue	Clarification
Appendix 2 to Spirit Energy's position statement for ISH8 Aviation Considerations P10	In regard to number of flights required.	The Applicant notes that Spirit Energy stated that 140 – 400 flights a year are required to the platforms. The Applicant notes that Spirit Energy have gradually increased the quoted number of flights required through the DCO process, from 80 flights during pre-application consultation (Table 8.4 of Chapter 8 Aviation, Military and communications of the Environmental Statement; APP-068), to 120 at Deadline 1 submission (Full written representation at Deadline 1; REP1-037) and to 140-400 at Deadline 7 submission. It is noted that no evidence as to the actual number of days flown has been submitted into Examination. The Applicant suggets that at least two to three years of flight data is required to provide a reliable indication of the number of flights required to both the Chiswick and Grove platforms.
P10	In regard to Spirit Energy's statement that they place some additional requirements upon its helicopter operators when flying on its behalf.	Spirit Energy have not advised the Applicant of what these additional requirements are. At the helicopter operator workshops held on 27th February 2019 CHC (the operator who is presently contracted to fly for Spirit Energy to the platforms in question) did not advise of any additional requirements and have advised that they follow EASA SPA HOFO Regulations, as per the Applicant's assumptions throughout the DCO process.
P10	Requirement for simulator trials	The diagrams of approach distance requirements (or footprints) provided by the Applicant are based on standard regulatory requirements and the Applicant does not therefore understand the need to fly these in a simulator as they are standard profiles flown every day by the helicopter operators. They do not require any change to procedure or modifications to the operators' operations manuals. The Applicant does not believe that the use of a simulator is the appropriate mechanism for verifying the footprints presented for these, and the following reasons: A training simulator is designed to provide sufficient realism to enable pilots to be trained in flight procedures, emergencies and basic aircraft handling. They contain an aerodynamic and performance model of the aircraft. However, due to the simulator regulations being written around aeroplane requirements, helicopters simulators usually have handling qualities which are worse than the actual aircraft; this tends to be due to a smaller field of view and certain motion cues not being replicated accurately. For the simulator trial under discussion for Hornsea Three, it is not expected that any increase in workload will occur as the helicopter will be flown using the autopilot upper modes, as per industry

Reference	Issue	Clarification
		guidelines. The flight profiles proposed for the trial are no different to those currently flown and so again no increase in workload should occur. Secondly, the performance model in the simulator will use the same source data as the Flight Manual performance graphs which have been used by the Applicant and Spirit Energy (Submitted by the Applicant at Appendix 37 to Deadline 7; REP7-057) to calculate the take-off distance required. Therefore, as the same source data will have been used, the trial results should (if a robust methodology is employed) replicate the calculations agreed by the Applicant and Spirit Energy. A simulator trial requires careful planning as the output will be sensitive to the trial parameters selected. These include temperature, air pressure, wind speed, the aircraft mass, the aircraft mass distribution (CofG), the point of helicopter rotation from the helideck, the point at which an engine failure is injected, the manner in which the engine fails and which autopilot modes are employed. If there is a desire to measure pilot workload, then pilots trained in assessing workload must be used (typically test pilots) and a rating scale, such as the Bedford Workload Rating Scale employed. Standard test methodology also requires a minimum of three test pilots to be used when workload or handling qualities are assessed, as even using rating scales, such as the Bedford Scale, or handling qualities using the Cooper-Harper Rating Scale, does include an element of subjectivity. The Applicant notes that the simulator trial submitted by Spirit Energy at Deadline 3 (AviateQ technical report; REP3-055) involved only one pilot flying (who was not a test pilot), with a non-pilot occupying the other pilot seat to take notes. As a training simulator is likely to have worse handling qualities than the actual aircraft, the importance of reducing subjectivity during a simulator trial is very important. The simulator trial must be flown on a Level D simulator for the current type operating to the Chiswick NUI (which was not the case in the previous simulator trial submitted by Spirit Energy at Deadline 3 (AviateQ technical report; (REP3-055)); even so the handling characteristics might not accurately reflect the actual aircraft under all phases of flight. In summary, careful planning will be required and a number of suitably qualified pilots employed on the trial. The Applicant notes that what is important is to agree the parameters that have been used in the preparation of the footprints. These parameters have been agreed with Spirit Energy and shared with the helicopter operators on the 25 March, with a request for feedback.

Reference	Issue	Clarification
		CHC has provided feedback on the footprints which included just two comments on the take-off footprint: the requirement for a 7000 kg take-off weight for the AW139 to be considered and the requirement for a wind speed of 0 knots to be considered. The Applicant has discussed these two comments with CHC. CHC has agreed that 7000 kg is not a realistic take-off mass as it does not provide out of ground effect hover performance, which would be a reduction in safety compared to the current performance available. The Applicant considers therefore that the weight used in the footprint presented by the Applicant (and agreed with by Spirit Energy in the slides presented at the ISH8) of 6400 kg is a realistic worst case for the Chiswick. With a westerly wind, and hence a take-off towards Hornsea Three, this allows a full load of 12 passengers and bags and with sufficient fuel plus reserves to return to Den Helder or UK airports such as Norwich. There is also the option to refuel on the J6A platform, as most shuttle passengers originate from there. For the AW139, operations at 6400 kg are only required for a take-off into immediate IMC on a westerly direction. Using met data from the J6A platform provided by Spirit Energy, westerly wind conditions with a cloud base below 600 ft occur for less than 6% of the time. When the cloud base is 600 ft or higher, an earlier turn in VMC can be made and so operations at up to 6800 kg are available. The Applicant has asked Spirit Energy to advise on the current payload of flights taking off from the Chiswick and Grove platforms (which will be recorded in the Vantage system) to confirm if 12 passengers are the standard load or less passengers is more typical to and from these NUIs. In regard to the second comment from CHC, a wind speed below 10 knots (and therefore of 0 knots) would enable take off to be in any direction and so the take-off would not be towards the wind farm and therefore no restrictions would apply. The Applicant also notes that Spirit Energy has stated that one of the aims of the simulator trial would be to assess turbulence. The Applicant advises that this comment shows a lack of understanding of the ability of a flight simulator as turbulence is not realistically modelled in a simulator. As the Applicant has advised (see position statement on Turbulence submitted by the Applicant at Appendix 22 of Deadline 7; REP7-042) what is required by the industry to verify the position of the Applicant that turbulence is not an issue, is real time measurements of turbulence on large wind farm arrays such as Hornsea Three, which could be set up by the Applicant on an existing Ørsted wind farm in collaboration with a leading expert such as Liverpool University in order to provide comfort to Spirit Energy.

Reference	Issue	Clarification
		Despite the Applicants reservations in regard to the use of a simulator as detailed above the Applicant has advised that they are willing to work with Spirit Energy for a simulator trial if this is what they see as essential for their verification process. If a simulator trial is to be undertaken the Applicant advises that the trials must be set up using a robust methodology. The Applicant does not consider the simulator trial presented by Spirit Energy at Deadline 3 (Aviateq technical report) to be robust for reasons listed in the Applicants submission at Deadline 4, response to ExA second set of written questions (REP4-012) and including those cited above. Whilst Spirit Energy have been able to secure a simulator, the Applicant's advisors are not available at this short notice to provide sufficient input into the planning or the trial itself. Furthermore, it is the Applicant's understanding that only four hours of simulator time has been made available and only 1 of the operators' test pilots is available for the short notice trial. Therefore, it is recommended that if a simulator trial is to be carried out, it occurs when sufficient time is available for both parties to plan the trial, when more simulator time is made available and all of the operators' test pilots are available.
P10	In regard to Spirit Energy's note that the CAA recognises in CAP 764, the effects of turbulence downstream of turbines can affect aircraft during critical stages of flight.	The Applicant asserts this is not the correct citation from CAP764 which actually states that turbulence should be a consideration for all aircraft (particularly in critical stages of flight). The Applicant has considered turbulence in the preparation of the position statement on turbulence as submitted at Deadline 7 (REP7-042). The Applicant also notes that the separation distance of 2.8 nm provided by the Applicant to Spirit Energy provides a 1 m buffer from the turbines when considering the worst case take off with engine failure at take-off and entering IMC.

Reference	Issue	Clarification
P11	In regard to Spirit Energy's statement that "it was emphasised by one of the helicopter operators that all the operators need to agree acceptable approach and departure profiles. This was to prevent any one helicopter operator gaining a commercial advantage during future tenders".	The Applicant advises that this statement was not recorded at the meeting. As previously noted by the Applicant, the flights being flown are not changed procedures.
P11	In regard to Spirit Energy's statement " The CAA is, also, the ultimate arbiter of changed operational procedures".	The Applicant states that there are no changed operational procedures being put forward as confirmed in the CHC meeting and the aviation workshop (Appendix 29 and Appendix 30 of the Applicants submission at Deadline 7).
P11 En Route Operating minima	En Route Operating Minima and En Route Descents	In regard to En Route Operating Minima, CHC and the other helicopter operators (Appendix 29 and Appendix 30 of the Applicants submission at Deadline 7) have advised En Route descents are the preferred option for approach to a platform. The Applicant notes the following comments in regard to En Route descends made by Spirit Energy are incorrect. Spirit Energy use an example of descending to 'shed' ice however the current aircraft under contract to Spirit Energy do not have an icing clearance. Spirit Energy comment that the weather radar must be serviceable. The Applicant notes that If the weather radar is not serviceable the helicopter can only depart the base under VFR and has to remain VFR throughout the flight.

Reference	Issue	Clarification
P12 Visual Gate Approaches Day and Night	Visual Gate Approaches	In regard to Visual Gate Approaches or VGA, the Applicant advises that the standard term is the HeliOffshore Approach Path Guidance profile. "Gate" is a common aviation term, denoting a combination of track, height (altitude) and speed. The HeliOffshore Guidance talks about "stabilisation gates" – but the term Visual Gate Approach or VGA is not used. Spirit Energy is correct in citing the HeliOffshore guidelines require a 1 nm run-in for a stabilisation point at 0.5 nm, but Spirit Energy then advise that "another operator" is using a 2 nm run-in. The operator NHV mentioned setting up at 2 nm during consultation with helicopter operators. NHV do not belong to HeliOffshore and do not fly the type of aircraft being operated to the Chiswick and Grove platforms. CHC has mentioned that descents at night and in Degraded Visual Environment (DVE) will require a 2 nm set up. An approach in DVE is still a VFR approach but in poor visibility. The aircraft will align at 2 nm (at 500 ft) and then descend to arrive at 300 feet at 1nm. As descents at night and in DVE should not be carried out while turning the final leg required is 2 nm. If an approach is set up at 2 nm it would not be applicable for a circling approach where the landing site should be kept in view at all times; the HeliOffshore profile under discussion could not be followed as it shows an altitude of 500 ft at 2 nm, at which point the helicopter may still be in cloud. The Applicant therefore considers the requirement to set up a 2nm final from any direction, is met for a VFR approach in DVE as sufficient space is available (at 2.8 nm), even though it is probably not applicable to a circling approach. The standard ARA circling approach, with a visual reference at less than 2 nm, will remain applicable which is available as confirmed by the helicopter operators and within EASA regulations.

Reference	Issue	Clarification
P13 Circling (Visual) Approach of an ARA	Circling ARA	In regard to Spirit Energy's statement that the Applicant has provided a footprint which has calculated the obstacle free footprint for a circling manoeuvre to be 2.42 nm and the MAP is at a range of 2 nm from the destination platform. The Applicant notes that Spirit Energy have misinterpreted the footprint provided, and that the Missed Approach Point for a circling approach is 0.75 nm (but can be further away). During a circling approach the crew must keep the landing site in view. Therefore, a circling approach would take place within 2 nm of the platform. The Applicant notes that Sprit Energy state that "the Applicant advised that, after discussion with one helicopter operator, 100 ft would be added to the cloud base requirement". The Applicant did not make this statement and, as confirmed by CHC and other helicopter operators in attendance at the aviation workshop , the weather minima assumptions used are correct. The Applicant disagrees with Spirit Energy statement that if there is any chance of becoming IMC, an additional 1 nm would need to be added (i.e. a footprint of 3.42 nm). The Applicant advises that during a circling approach the helicopter will be operating VFR in order to conduct a circle and so the 1 nm IFR avoidance criteria is not required.
P17 Meteorological Data analysis	Meteorological Data analysis	The Applicant is responding in regard to the meteorological data analysis provided at p17 (in Spirit Energy's position statement at deadline 7 (REPP7-093)) in the Update to the J6A report to be submitted at Deadline 9. The agreement between the Applicant and Spirit Energy on the analysis of the meteorological data is presented in the Joint agreement statement submitted at Appendix 25 to Deadline 9. The Applicant advises that the results of the meteorological data analysis presented by Spirit Energy at Deadline 7 (REP7-093) has been superseded by the numbers presented in the Joint agreement statement to be submitted at D9.

Reference	Issue	Clarification
Appendix 5 to Spirit Energy position statement for ISH 8 Potential Affects on Safety Aviation P21	In regard to Spirit Energy assertion that the Applicant initially envisaged that 7 nm would be required to ensure safe operation in the Environmental Statement	The Applicant has never had this position and maintains as per the Figure 7.5 in Volume 5, Annex 8.1: Aviation, Military and Communication Technical Report of the Environmental Statement (APP-113) that 7 nm is the minimum separation distance at which ARA in certain wind directions might be restricted by Hornsea Three.
P22	In regard to Spirit Energy's assertion that The Safety Case for the Chiswick and Grove NUIs identify helicopters as the preferred means of evacuation, save in instances of fire and explosion.	The Applicant notes that Spirit Energy have not provided the Safety Cases for the Chiswick and Grove platforms. The Applicant notes that they have been advised during consultation with Spirit Energy in March 2019 that the method of evacuation in the event of a CPA/TCPA alarm sounding is to lifeboat. The Applicant maintains that evacuation requirements by helicopter are therefore not used for fire, nor explosion and not collision risk. When required they can be conducted, weather permitting, via shuttle to the J6A platform, or by SAR which operate to a wider weather window.
Appendix 7 Clarification to matters arising from ISH8 Hearing P32	Number of unplanned helicopter visits.	Spirit Energy cite the number of unplanned helicopter visits to the platforms (In 2017, Spirit Energy had 42 unplanned visits to the Grove NUI and 66 unplanned visits to Chiswick) however the nature of these unplanned visits has not been specified. Unplanned helicopter visits which if not made would result in a shut down of the facility are the visits that are relevant for this purpose. The Applicant asked Spirit Energy at Deadline 5 to confirm how many of these unplanned visits were made but have not received a response.
P33	Beatrice Wind Farm.	Spirit Energy advise that the nearest turbine to Beatrice A platform is 1.9 km. This is not correct it is 0.8 nm (1.5 km). Spirit Energy quote the hub height of the turbine as 88 m. It is the tip height which is relevant which is 500 ft (152 m).

Reference	Issue	Clarification
P33	Walk2work vessels	Contrary to the statement made by Spirit Energy, the Applicant has not put forward the use of walk2work vessels for unplanned work. The Applicant has put forward the use of walk2work vessels for planned maintenance campaigns and for access to the C6 and C7 wells for planned well workovers, etc at these facilities which is becoming increasingly common practise in the industry and for which Spirit Energy has done at other facilities.

3. Applicants Response to Appendix 3 of Spirit Energy Position Statement for ISH 8 (REP7-094)

Comment Number	Spirit Energy Comment	Applicants Response
1	The effects of weather on traffic, with respect to Spirit Energy assets in the Markham area have not been considered, especially in northern or westerly strong wind conditions.	Response 1: The baseline surveys were carried out over different time periods as required by MGN 543 to assure seasonal variations were taken into account (summer / winter). This also meant different weather conditions were experienced during the traffic surveys. In addition, stakeholder consultation was carried out on adverse weather routeing with alternative routes being provided by one of the main operators crossing East/West. This is documented in Section 16 of the NRA.
2	In general, and taking into account the prevailing winds/tides for the area, whether engine failure or other circumstances could cause vessels to drift into danger (specifically within this paper, to Spirit Energy installations).	Response 2: The NRA predicted that vessels would be re-routed away from the Spirit Energy installations, which will be shielded by the wind farm to a certain extent. Therefore, on average there will be more recovery time should any vessels drift in the area.
3	The NRA fails to recognise that vessels may transit through the array in future, thus creating an unrealistic predicted set of traffic flows post-construction.	Response 3: Internal navigation within the wind farm was considered for small vessels, i.e., fishing and recreation. It was not considered for larger commercial vessels based on several years of experience of existing UK wind farms, where commercial vessels have not been observed transiting inside a wind farm (based on long-term Anatec survey data), and the evidence from the extensive consultation with vessel operators that were identified in the baseline surveys to be using the Hornsea Three area, such as DFDS Seaways, who indicated they would instruct their ships as part of their standing orders to route around the outside of the wind farm. This is in-line with MCA MGN 372 Guidance which states that where there is sufficient sea room (as in the case of Hornsea Three) it is prudent to avoid the area completely. In addition to this the Dutch authorities do not allow vessels greater than 24m in length to pass through wind farms. These vessels traversing the North Sea are highly likely to plan their routeing to avoid going through wind farms.
4	The NRA only addresses turbines in a single line of orientation, and the siting of turbines is only given as exemplars.	Response 4: A standard design envelope approach has been followed and there has been considerable engagement with the relevant organisations, MCA and Trinity House, on layouts. Spirit Energy have not suggested their support vessels would choose to (or be allowed to)

		pass within the array. The Applicant also notes that based on their normal routeing identified in the NRA this would be an inefficient route to take. During the Hazard Workshop, Oil & Gas operators (including Spirit) indicated their support vessels would use the navigational corridor between the Hornsea One/Two and Three arrays when routeing north-south between the onshore base at Great Yarmouth and oil & gas fields to the north.
5	The confined sea room resulting from the proposed array, around Grove has not been considered in the NRA. A theoretical assumption has been made in the NRA that East/West traffic between the Humber and North-West European ports will pass to the North of the array post-construction. However, as the distance to the South is (marginally) shorter and also gives greater clearance from the array, it is inevitable that, in certain weather conditions, traffic around Grove will increase	Response 5: The baseline surveys identified all the main routes and reviewed each on a route-by-route basis (departure port to destination) to estimate how they would be affected by Hornsea Three in isolation and also taking into account cumulative impacts. Overall, it was estimated that approximately 60% of East/West traffic would re-route to the north and 40% to the south of Hornsea Three. Therefore, it is incorrect to say a theoretical assumption has been made that vessels will pass to the North. For eastbound vessels where it is efficient to re-route to the south of the wind farm (approx. 1-2 per day), there is no benefit in then turning sharply NE towards Grove. Based on current routeing these vessels are anticipated to carry on eastbound to either cross or join the Off Botney Ground Traffic Separation Scheme. With regard to north-south traffic, this is even lighter in the vicinity of Hornsea Three. Vessels are not expected to weather route to the east of the wind farm, e.g., in westerly gales. There are alternative routes available (and currently in use) such as inshore. Also a channel has been designed for north-south traffic to the west of Hornsea Three (designed and agreed in consultation with the MCA and Trinity House, and suitable for use in all weathers). Therefore, any weather routeing east of Hornsea Three would be an infrequent event and, in any case, vessels would be outside the wind farm and able to be monitored by the J6A control room using the Radar (and AIS) Early Warning System (REWS). Based on this, there is no justification for a channel to the east of the wind farm due to the lack of any current or future route that would use it, which is a prerequisite for a shipping channel.
6	The NRA as presented does not show that the risks associated with diverted traffic collisions/allisions to Spirit Energy assets have been reduced to ALARP. This is despite being informed of the HSE recognised Major Accident Hazards associated with allisions/collisions on 20th September 2017.	Response 6: Based on the evidence in the NRA, including re-routeing assumptions guided by consultee feedback, the risk of platform allision is expected to be reduced, as vessels on average will increase their passing distances. It is agreed platform allision is a Major Accident Hazard according to the HSE regulations. However, if the change in risk caused by the wind farm is a reduction (or neutral) as

		expected then there is no case for Cost-Benefit Analysis or ALARP arguments. Further it is noted that Spirit Energy has identified a predictive REWS as effective mitigation against platform allision risk, which it has been established they already have in place on J6A covering the Chiswick and Grove NUIs closest to the wind farm.
7	By not accepting the concerns of Spirit Energy (20th September 2017) to highlight the Major Accident Hazards (MAH) associated with gas platforms (as highlighted by the Methodology, paragraph B3.3, H1 Accident Category (2) (4) Explosion) and the HSE, the Applicant has, in effect, excluded any consideration of the associated risks and these have 'fallen out' of the NRA process and are therefore not considered despite the potentially catastrophic consequences.	Response 7: The Methodology is concerned with explosions on a vessel. With regard to allision, the September letter only mentions potential impacts on REWS which are addressed in the ES and from subsequent meeting in Netherlands on 1st March 2019 have been found to be acceptable (subject to a trial). It is noted Spirit Energy's Marine and Aviation HSE Lead attended the Hazard Review Workshop carried out on 23 February 2017 as part of the Hornsea Three NRA and did not raise platform allision risk as a concern.
8	The NRA does not address the most serious risks associated with the proposed wind farm development.	Response 8: Risks are a combination of frequency and consequence. It is agreed that the consequence of an allision could potentially be extremely serious, whether they happen today or post-construction of the wind farm. However, the wind farm is not expected to increase the likelihood of an allision, in fact the opposite. Again it is noted that the Spirit Energy representative at the Hazard Review Workshop raised no concerns with regard to platform allision risk.
9	The NRA does not assess the high severity outcomes of explosions, associated with allisions with gas platforms in the immediate vicinity of the proposed wind farm.	Response 9: Refer to Responses 7 & 8.
10	The NRA does not assess the effect(s) of traffic navigating in and through the proposed wind farm (as required by the Guidelines) and the potential effects on the Spirit Energy installations (Note this is supplemental to 3).	Response 10: Refer to Response 3. The NRA does not consider the wind farm to be impermeable or a no-go area. It is based on evidence from existing traffic surveys, stakeholder consultation and MCA guidance. Internal navigation risk is considered in Section 22.13 of the NRA.
11	Although de-commissioning operations are mentioned in the NRA, they are not considered in the NRA such that the risks or economic consequences can be considered ALARP in relation to Spirit Energy assets.	Response 11: The Spirit Energy assets are outside and sufficiently distant from the wind farm such that decommissioning can take place. It is noted such operations tend to be non-routine, specialist operations and there is industry guidance that can be followed, e.g., weather limits. The same types of vessels that decommission oil & gas platforms have been observed working inside wind farms which demonstrates they can operate in much less sea room than will be available surrounding the Spirit Energy assets.

12:	The NRA does not address all planned oil and gas activity in the vicinity of the proposed wind farm.	Response 12: Information in the public domain at the time was assessed in the ES. Spirit Energy were consulted as part of the NRA.
13	In failing to have identified the Major Accident Hazard of explosion, resulting from vessel/installation collisions, the NRA then does not address the risks associated with the risk factors noted above in relation to the Spirit Energy installations, especially Grove, and the associated G5 sub-sea well (during well work over activity) and the projected sub-sea wells in the locations of C6 and C7.	Response 13: Information in the public domain at the time was assessed in the ES. Spirit Energy were consulted as part of the NRA.
14	The NRA does not address the potential effects on SAR or emergency response to an unforeseen incident at a Spirit Energy installation.	Response 14: SAR is assessed in detail with respect to potential searches inside the wind farm. SAR to a Spirit Energy asset external to the wind farm should not be affected. Allision risk is expected to reduce due to the wind farm displacing traffic that currently passes close to the Markham Assets further away.
15	The NRA does not draw on real world experience of the consequences of vessel collisions with producing gas platforms.	Response 15: There have been 10 collisions with oil & gas platforms to date on the UKCS (since 1970s). No fatalities or platform collapses have resulted. Nevertheless, the potential consequences of any ship/platform allision could be catastrophic, the same as they could be today as it is the same vessels passing in proximity; this is not affected by the wind farm. Based on the evidence-based NRA re-routeing predictions, the frequency of an allision is expected to reduce. Therefore, the overall risk of allision is expected to reduce.