

Hornsea Project Three
Offshore Wind Farm



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Written summary of Applicant's oral case put at Issue Specific
Hearing 8 (7th Mar 2019)

Date: 14th March 2019

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

1. INTRODUCTORY REMARKS

- 1.1 Issue Specific Hearing 8 ("ISH") was held at 09:30am on 7 March 2019 at the Mercure Norwich Hotel, 121-131 Boundary Road, Norwich, NR3 2BA.
- 1.2 The ISH took the form of running through items listed in the agenda published by the Examining Authority (**ExA**) on 27 November 2018 (the "**Agenda**"). The format of this note follows that of the Agenda and refers to the Applicant's Response to the first written questions ("**FWQ**") (the "**Response to First Written Questions**") [REP1-122] and the further written questions (the "**Response to Further Written Questions**") [REP4-012] numbers where relevant. The Applicant's substantive oral submissions commenced at item 3 of the Agenda, therefore this note does not cover items 1 and 2 which were procedural and administrative in nature.
- 1.3 Four Annexes are included with the written summary to ISH 8 including:
- 1.3.1 Annex A: Shipping and Navigation Summary Position
 - 1.3.2 Annex B: Aviation summary position
 - 1.3.3 Annex C: Schematic of weather minima and helicopter approaches (day)
 - 1.3.4 Annex D: Comments on Spirit Energy Aviation slides

2. AGENDA ITEM 1 – INTRODUCTION OF THE PARTICIPATING PARTIES

- 2.1 The ExA: - David Prentis (Lead Panel Member), Guy Rigby, David Cliff and Dr Roger Catchpole.
- 2.2 The Applicant:
- 2.2.1 Speaking on behalf of the Applicant: - Gareth Phillips (Partner at Pinsent Masons LLP).
 - 2.2.2 Present from the Applicant: - Stuart Livesey (Development Manager), Andrew Guyton (Project Manager), Gareth Parker (Electrical Project Manager), Oliver Palasmith (Commercial Manager), Meltem Duran (Concept and Layout Manager).
 - 2.2.3 The Applicant's legal advisors:- Claire Brodrick (Pinsent Masons LLP) and Peter Cole (Pinsent Masons LLP).
 - 2.2.4 The Applicant's consultants (listed alongside their relevant environmental topic area):
 - (a) Navigation and other offshore operations:
 - (i) Samantha Westwood (Principal Risk Analyst at Anatec Limited);
 - (ii) Mark Prior (Aviation Consultant at Anatec Limited).
 - (iii) Dr Emily Wood (Project Director, RPS);
 - (iv) Ali MacDonald (Principal Risk Analyst. Anatec Ltd); and
 - (v) John Beattie (Principal Risk Analyst. Anatec Ltd).

2.3 The following parties participated in the ISH:

2.3.1 Spirit Energy represented by:

- (a) Christiaan Zwaart (Barrister, 39 Essex Street);
- (b) Max Rowe;
- (c) Robert Sinclair;
- (d) Ray Reynolds; and
- (e) Karen Hamilton (Partner, Brodies).

2.3.2 Trinity House.

- (a) Captain Trevor Harris; and
- (b) Stephen Vanstone.

3. **AGENDA ITEM 3 – LAYOUT DEVELOPMENT PRINCIPLES AND EFFECTS ON SEARCH AND RESCUE OPERATIONS**

3.1 The ExA confirmed that it had issued a Rule 17 letter to the Maritime and Coastguard Agency (**MCA**). Gareth Phillips on behalf of the Applicant explained that further discussions had taken place with the MCA on the Layout Development Principles and noted that it was regrettable that the MCA could not attend the hearing. Mr Phillips set out the Applicant's understanding of the current position which is that all principles are agreed except principle 3 which relates to lines of orientation.

3.2 Mr Phillips highlighted that in order to achieve agreement on the other principles, the Applicant made some significant concessions in order to satisfy the MCA. Mr Phillips clarified that the Applicant does not consider that the concessions are necessary and maintains its original position, however, the Applicant would rather have an agreed set of Layout Development Principles that may not be ideal rather than have none at all in order to speed up post consent approvals.

3.3 The Applicant referred to a tracked changed version of the Layout Development Principles for agenda items (a) to (e) which was made available on the screen at the

3.4 **a) Helicopter Refuge Areas (Principle 5)**

3.5 In response to a question from the ExA regarding the provision of a helicopter refuge area (**HRA**), Samantha Westwood of behalf of the Applicant explained that the Applicant has agreed with the MCA and Trinity House to provide a HRA area (0.5399 (equivalent to 1km) to 1nm width]). The distances would be added to the next version of the Layout Development Principles. However, Ms Westwood reiterated that the Applicant's position was that a 1 nm HRA was not required based on the Applicant's technical evidence.

3.6 Mark Prior on behalf of the Applicant explained that the Applicant's evidence based approach demonstrates that the 1km spacing within the array provides sufficient space to turn. None of evidence or discussions with the MCA has supported the need for a HRA however the Applicant has agreed to concede on this point.

3.7 For the benefit of the Examining Authority and to demonstrate why he was qualified to comment on the issues raised at the hearing, Mr Prior summarised his background and expertise. Mr Prior stated that he had over 40 years experience in aviation, spending 20 years flying with the Royal Air Force (including 6 years as an experimental test pilot). Mr Prior had then joined Bristow Helicopters and had 18 years

experience as a pilot flying offshore commercial air transport and search and rescue (**SAR**). He was the Chief Test Pilot and Manager for Global Operational Standards and SAR. Mr Prior added that he was a member of the committee which wrote the operational regulations for offshore operations. One of his current projects is developing a Risk Assessment for Airborne Radar Approaches for the Civil Aviation Authority. He had also worked with the Irish and Icelandic coastguard, on oil and gas SAR in the North Sea and with the Ministry of Defence and Scottish Crown Office.

3.8 The ExA referred to the MCA's Deadline 5 report which stated that the MCA's experience within wind farms to date is that the SAR pilots stick to the SAR lanes and only turn in clear areas.

3.9 Mr Prior reiterated that the Applicant had taken an evidenced based approach. The Applicant had tried to discuss the issues with the SAR pilots but the MCA had not allowed such discussions to take place. Mr Prior explained that the MCA had previously referred to trials in Loch Ness but withdrew that data when it was shown to be faulty. The MCA is now referring to two cases flown at 80 kt airspeed. The first example has 40 kt of wind at a 30 degree angle to the track: the distance taken to turn 180 degrees is the same figure the Applicant has quoted (0.12nm). The second example shows a 40 kt wind from 90 degrees to the right: the distance to turn in this case is 0.1 nm, Mr Prior clarified that the turning circle is reduced when turning into the wind.

3.10 Mr Prior explained that these were similar conditions to flying in mountains where the pilot takes account of the wind when turning and can turn towards the wind to minimise the turning distance. If there is a strong wind then this cuts down the distance involved. The MCA have conflated two issues (i.e. poor visibility and strong winds) and in the offshore environment these two events rarely occur at the same time. Mr Prior added that the Applicant had reviewed one year's worth of MET data from the nearby J6A platform and there were no events when wind speeds were above 30 knots and the visibility was below 1000m. The Applicant then carried out a review of the weather data from Hornsea Project One which is 7 years worth of data. Hornsea Project One is located 10 minutes from Hornsea Project Three. In 7 years, periods when the visibility was below 1000m and windspeeds above 30 kt occurred on 0.016% of the time. At 1500m visibility the probability increased to 0.041%, which equates to approximately one day in 7 years. Mr Prior concluded that if the winds are strong then the visibility is good. If visibility is poor then wind speeds are low. This evidence supports the Applicant's position that SAR helicopters can turn within the distances provided and that the SAR lanes alone provide sufficient space to turn.

3.11 In response to a comment from the ExA that the SAR crews themselves don't believe there is sufficient space between the turbines, Mr Phillips explained that the evidence submitted by the MCA is flawed in some areas. Mr Phillips highlighted that the MCA have not attended either hearing or made those providing the evidence available to discuss the issue with the Applicant. The Applicant is therefore unable to test the evidence provided both inside the Examination and outside the Examination. In contrast, the Applicant has put forward evidence by a SAR pilot who is very experienced and that can be tested. Mr Phillips added that the issues referred to by the MCA do not reflect circumstances found in the North Sea.

3.12 Mr Prior added that the SAR operational crews do not have experience of operating in wind farms similar to Hornsea Three. Their experience is based on wind farms located closer to shore which are smaller and more tightly packed. Mr Prior considered that the MCA had not properly taken into account the greater spacing of turbines in the Round 3 wind farms.

3.13 The Applicant notes that Trinity House confirmed that it was prepared to accept AIS transmitters which are activated in the event of SAR activity within the site.

3.14 **b) Width of development lanes (Principle 8)**

- 3.15 In response to a question from the ExA regarding the tolerance either side of the line of orientation, Ms Westwood confirmed that the Applicant had agreed to accept a tolerance of 100m in order to facilitate the approval of the Layout Development Principles. Ms Westwood clarified that this concession did not change or undermine the technical evidence submitted by the Applicant.
- 3.16 Mr Prior explained that the evidence submitted by the Applicant took full account of equipment fitted to the SAR helicopters. Mr Prior confirmed that he was fully aware of equipment as he was part of the team that bid for and won the MCA SAR contract. The equipment includes radar, AIS, infra red camera, high definition and low light cameras, moving map and an obstacle warning system. The equipment allows the helicopter to approach within 150m of a turbine in the thickest fog (i.e. completely blind). However, the MCA have not taken account of this equipment but instead used only a visual search. Mr Prior added that this equipment was used for all kinds of obstacles, for example ships and cliffs. Mr Prior confirmed that the aircrafts supplied by the operator for the MCA SAR contract have this equipment.
- 3.17 In response to a question from the ExA regarding the MCA's point that increasing the area in which the turbines could be located from the centre would increase the area that could not be searched with a helicopter, Mr Prior explained that the MCA have not given any evidence to support this position. Mr Prior reiterated that the MCA have not taken into account the sophisticated equipment on board, such as infra red camera, but based their position on a visual search.
- 3.18 In response to comments made by Trinity House relating to the navigation of vessels, Ms Westwood explained that based on the evidence for existing wind farms, vessels do not navigate straight through the windfarm. Instead vessels weave in and out to suit their end destination. However, Hornsea Three will be very different to existing windfarms as a vessel (given the 1,000m minimum spacing) will have limited visibility past the next turbine. The Applicant has considered internal safe navigation in its navigation risk assessment (**NRA**) and the key concern reported back from stakeholders is spacing (which Hornsea Three satisfies) rather than alignment.
- 3.19 Ms Westwood confirmed that originally the Applicant was seeking to define the overall width of the development lanes. Now the width of the lane will not be defined but instead the drafting will refer to the tolerance from the centre line. The intention is for blade over sail to be allowed outside of the tolerance. Ms Westwood clarified that this would not interfere with the minimum (agreed) 500m SAR lanes.
- 3.20 The Applicant notes that Trinity House confirmed its agreement to this approach and the amendments to the principles.
- 3.21 **c) Lines of orientation (Principle 3)**
- 3.22 In response to a question from the ExA as to whether principle 3 would be resolved by end of Examination, Mr Phillips explained that it was unlikely that agreement would be reached and the ExA will therefore need to make a recommendation on this issue. Mr Phillips explained that the principle applicable guidance is MGN543. This guidance makes it clear that single lines of orientation are permissible where there is a safety case. Mr Phillips confirmed that the NRA submitted with the application was widely consulted on and took into account comments raised regarding safety. The Applicant's view is that the safety case for a single line of orientation is set out in the NRA. Mr Phillips added that the MCA have an aspiration to move away from MGN543 and achieve more than one line of orientation going forward. However, this position is not enshrined in guidance and there is currently no timetable as to when that will happen and be consulted. Mr Phillips explained that the Applicant does not believe that the MCA has an issue with the NRA, however, its rejection of the single line of orientation is part of the MCA's aspiration going forward. The Applicant understands that the MCA is taking the same approach with other windfarm developers.

- 3.23 Mr Phillips explained that the line of orientation is linked to energy yield. Therefore the Secretary of State will need to balance the national need for energy with the issues raised by the MCA. Mr Phillips added that there was no framework to discuss layout with the MCA in previous schemes and this had caused delays. Mr Phillips referred to the fact that a number of other plans need to be submitted prior to the commencement of works under the DMLs, for example the SIP, and none of those plans can be advanced until there is a confirmed layout. Mr Phillips emphasised that layout runs to core of the post consent progress. There is therefore a need to have the Layout Development Principles in place. Mr Phillips concluded by stating that the Applicant's position is based on guidance and the MCA's position is based on aspiration.
- 3.24 In response to a question from the ExA regarding the rationale for the two lines of orientation, Ms Westwood explained that the requirement for two lines of orientation is based on the conditions at a site including the distance offshore and the level of traffic likely to navigate within the array. Ms Westwood confirmed that there was no evidence that two lines of orientation would change the level of risk or alter the ability of vessels to navigate within the array at Hornsea Three. The NRA focussed on a single line of orientation or non grid layout and therefore all evidence and consultation is based on a single line. Ms Westwood explained that the NRA demonstrates that the impacts are acceptable. Ms Westwood added that one of the key points to consider in this case was the spacing and no other project has spacing of this size yet. Ms Westwood again reiterated that vessels will navigate the most convenient course through the array.
- 3.25 Ms Westwood confirmed that two lines orientation does typically mean a grid or honeycomb layout.
- 3.26 In response to comments made by Trinity House for the safety case to be in a separate document, Mr Phillips explained that the safety case is set out in NRA. The Applicant can prepare a separate document but it would only contain the information set out in the NRA. However, Mr Phillips acknowledged that producing a separate document may assist the ExA and Interested Parties. Mr Phillips noted that whilst Trinity House has expressed a preference for two lines of orientation, it would accept a single line if there is a safety case.
- 3.27 Ms Westwood added that Hornsea Three is the only windfarm that has considered a single line of orientation from the outset. Other windfarms have based the NRA on a grid layout and therefore have been required to undertake additional assessment work to demonstrate that the layout is compliant with the NRA.
- 3.28 The Applicant notes that Trinity House confirmed that the correct guidance is MGN543.
- 3.29 In response to a question from the ExA regarding difficulties for SAR in strong cross winds and if having more than one line of orientation would result in more options for SAR, Mr Prior explained that there were two main issues relating to visibility and orientation of crews. Mr Prior considered that there was a lack of appreciation of the size and layout of this array by the MCA. If the visibility is poor, layout does not matter and the helicopter's equipment including AIS will be used. In relation to turning, the MCA appears to take the view that with two lines of orientation then turning is improved. Mr Prior explained that this is flawed as the distance between the turbines remains the same so having more than one line of orientation does not assist turning. Mr Prior clarified that if all turbines are at least 1000m apart whether within single or two lines of orientation then two lines of orientation is no better than one line.
- 3.30 In response to a question from the ExA regarding a strong following wind and having more options with two lines of orientation, Mr Prior explained that whilst it was included in the MCA's report there was no evidence to support this position. If the visibility was poor then Mr Prior considered that the pilots would use the SAR autopilot modes to fly. This would enable the pilot to select the ground speed mode during a

search pattern. Mr Prior confirmed that the spacing for a search pattern does not change because turbine spacing remains the same with two lines of orientation.

3.31 Mr Prior explained that the ground speed flown would depend on visibility as the search legs are based on how far you can see. The search pattern depends on whether you have location for a survivor or if it is a general search. Mr Prior added that with a visibility of 1000m, typically ground speeds are 60 knots so the time from one turbine to the next is 40 seconds. In the Applicant's discussions with MCA to date, the MCA representatives admitted that they do not have SAR expertise. Mr Prior has asked to have a meeting with the operator but this request has been turned down due to concerns that the operator might change.

3.32 In response to a question from the ExA, Mr Prior confirmed that if flying at 60 knots with a 40 knot following wind then it would be possible to achieve an air speed of 20 knots. A SAR search would generally start in a downwind position and fly upwind as people/vessels tend to drift. The aircraft would then fly downwind to reposition for next search lane.

3.33 **d) What if the Layout Development Principles are not agreed by the end of the examination?**

3.34 Mr Phillips explained that the parties have a largely agreed set of Layout Development Principles and the Applicant acknowledges that the MCA has worked with the Applicant on this. Mr Phillips confirmed that the Applicant will repackage the safety case. This would not involve any new information but would collate the information submitted in NRA and during the Examination. The Applicant will be requesting that the ExA issues a recommendation on whether a single of line of orientation is acceptable and the Secretary of State will need to make a decision on layout. The ExA and Secretary of State will need to balance the views of the MCA with the evidence submitted by the Applicant whilst being mindful of impact on orientation on energy yield and energy need. Mr Phillips referred to the Government statement released on 6 March 2019 relating to the energy sector deal which seeks to achieve 30% of energy from renewables by 2030. Mr Phillips reiterated that a balance needs to be struck and that the Applicant has submitted evidence to support single line orientation. Mr Phillips added that the layout goes to the core of how scheme will be delivered, if layout principles are secured then the Applicant has the certainty to prepare all of the other documents required to discharge pre commencement conditions. The Layout Development Principles are therefore critical to delivering the project on time, with a certain yield to meet the energy targets.

3.35 In response to a question from the ExA, Mr Phillips confirmed that the Applicant considered that the Secretary of State had the ability to select which set of principles was included in the consent. Mr Phillips added that the Secretary of State can also seek further details during the determination period and finalise the drafting of documents.

3.36 In response to a comment made by Trinity House, Mr Phillips confirmed that this was not the first project to include a layout principles as they have been included in Dogger Bank Creyke Beck and Dogger Bank Teesside Development Consent Orders. Mr Phillips explained that whilst this was the first Orsted project to include an agreed layout, the reason for including the layout was based on Orsted's previous experience of the time taken to agree the layout post consent. Like other conditions, most stakeholders like to have a framework to work to in future. From the Applicant's perspective, it would like to reduce the variables and achieve the discharge of other conditions sooner.

3.37 **e) Any other matters relating to the Layout Development Principles**

3.38 In respect of a point raised by the ExA in its Schedule of Changes to the dDCO, Mr Phillips explained that the Applicant's proposed wording was intended to provide both

Applicant and MMO, MAC and Trinity House with some flexibility to enable the MMO to be able to depart from the Layout Development Principles in certain circumstances such as a design change or a change in law or guidance. However, Mr Phillips confirmed that the Applicant understood the point made by ExA and would seek to clarify what would constitute a material change in circumstances in the next version of the dDCO.

4. AGENDA ITEM 4 – OIL AND GAS OPERATIONS – THE APPROACH TO DECISION MAKING

4.1 Mr Phillips provided an update on discussions between the Applicant and Spirit Energy since the last hearing on this issue. A meeting took place between technical experts on 17 December 2018 and further meeting between parties was held on 16 January 2019. On 21 February 2019 a workshop was held with CHC (the helicopter service provider used by Spirit Energy). On 27 February a wider workshop was held with other helicopter providers including CHC. On 1 March 2019 a meeting took place to discuss the early warning radar system. Mr Phillips confirmed that the parties had held a brief meeting on 7 March 2019 and prior to the hearing commencing.

4.2 Mr Phillips explained that the meeting on 17 December 2018 was held so that the technical advisers could agree on the assumptions used to underpin the assessments. There were a number of actions arising from the meeting and those actions have largely been delivered with the exception of a table of assumptions being used by Spirit Energy being provided to the Applicant. At the meeting on 16 January 2019, the parties discussed navigation and the modelling. Mr Phillips confirmed that Mr Reynolds attended the workshop on behalf of Spirit Energy on 21 February 2019 with CHC (the helicopter operator currently contracted to Spirit Energy). At the workshop the attendees discussed the assumptions underlying the Applicant's evidence, which guidance CHC relies on and what practical measures CHC takes in terms of landing and take-off at platforms. At the wider workshop on 27 February 2019, the Applicant presented its assumptions to other helicopter operators. Mr Phillips noted that CHC and the other helicopter operators confirmed that the assumptions used by the Applicant were correct including the applicable guidance and the methods and approaches considered when landing at existing platforms.

4.3 In respect of the radar system at the J6A platform, it was established that if there was a Radar Early Warning System (REWS) then there would be a potential impact from Hornsea Three. At the meeting on 1 March 2019 it was confirmed and accepted that the J6A platform has been fitted with a REWS system. The Applicant has accepted that there may be an impact but there is confidence between the technical advisers that a mitigation solution is available in the form of a software update. Mr Phillips explained that the extent of the impact cannot be determined until the turbines have been erected as that will then allow the radar to operate and any issues be identified. Mr Phillips reiterated that this was essentially a software issue and there was a practical solution to solve the issue which may very well be able to be performed by Spirit Energy. Mr Phillips explained that the parties still need to agree when and how the need for mitigation will be assessed and the cost.

4.4 Mr Phillips summarised that dialogue is ongoing between the parties and going in the right direction. Mr Phillips confirmed that a revised proposal had been offered by the Applicant to Spirit Energy. This proposal has been offered on a without prejudice basis as the Applicant's technical evidence supported the Applicant's position that Hornsea Three would not have a significant effect on the commercial operations of Spirit Energy. Mr Phillips explained that there was an expectation on the part of BEIS and the Crown Estate that licensees would behave in the spirit of coexistence, which is set out in industry policies outside of the Planning Act process. There is a duty on both parties to act within this spirit. The Applicant had looked at the points raised by Spirit Energy and looked at the worst case scenario for take off (considering flight directly towards the turbines, wind speed and direction, heavily laden and engine failure at take off). The Applicant was prepared to offer a 2.8nm exclusion zone around the

existing infrastructure at Chiswick, namely Chiswick platform (i.e. no turbines). This would provide an adequate separation distance for the worst case take off scenario. This would also enable greater availability of circling ARA and go around with one engine inoperative. In respect of the Grove platform, which is a declining asset, the Applicant's position is that mitigation is not required due to the distance between the array and the asset. However, the Applicant is prepared to offer a 2.8nm protection area, which is similar to that provided in the East Anglia Three protective provisions, whereby a proximity agreement would be required if necessary prior to any development taking place. At the point of development there will be more certainty over the future operations at Grove.

- 4.5 In respect of the C6 and C7 prospective wellheads to the west of Chiswick, Mr Phillips confirmed that the Applicant was prepared to offer a 1nm protected area around each proposed well head. If the Applicant wished to build within that protected area then a proximity agreement would be required. This approach means that the Applicant does not have to make a decision now on the likelihood of C6 and C7 going forward. The Applicant understands that development of C6 (and then C7) is contingent on the findings from C5. The Applicant's position is that 1nm is a sufficient area for vessel access and limited helicopter access. If Spirit Energy decides to proceed with C6 and C7 prior to the construction of Hornsea Three in this area then it can use whichever access it selects, if it proceeds after the construction of Hornsea Three then Spirit Energy will need to select access taking consideration of the wind turbines. Mr Phillips reiterated that the Applicant does not consider that protective provisions are necessary but the Applicant has put forward this proposal in the spirit of coexistence. Mr Phillips noted that no further revision of the protective provisions had been submitted by Spirit Energy and the original version was too onerous and too wide. Mr Phillips confirmed that the Applicant is proposing to submit draft protective provisions based on the East Anglia Three drafting for comment at DL7 and there would then be the potential for a SoCG to be submitted at DL9.
- 4.6 In response to a question from the ExA, Mr Phillips confirmed that the need for mitigation measures relating to the radar system would be provided for in the protective provisions, however, the detail for the measures would be set out in a separate mitigation plan.
- 4.7 **a) NPS EN-3**
- 4.8 The ExA referred to paragraph 2.6.183 of NPS EN3 and the requirement to reduce risk to as low as reasonably practicable.
- 4.9 In response to Spirit Energy's assertion that the Applicant had not complied with this policy requirement, Mr Phillips explained that the phrase "*as low as reasonably practicable*" should be afforded its ordinary meaning in this context and that had been agreed by Spirit Energy. The Applicant considers that Spirit Energy is conflating what is meant by EN3 and what is meant under the HSE's principle of ALARP. On a normal reading of the words the Applicant is required to look at the risks arising from project and reduce them if possible. Mr Phillips confirmed that the Applicant has carried out this exercise through the ES.
- 4.10 Mr Phillips explained that the Applicant cannot undertake an ALARP assessment as the responsibility for ALARP sits with Spirit Energy and involves a commercial decision making process framed within parameters set by the HSE that balances the risk to third parties with the resources available and cost. It was not possible for the Applicant to undertake this analysis. Mr Phillips noted that no other windfarm consent application has been required to undertake an ALARP assessment for aviation before.
- 4.11 Mr Phillips confirmed that there is information within the ES that demonstrates that the Applicant has undertaken steps that are reasonably practicable to reduce risk. Mr Phillips noted that Spirit Energy has accepted that there is information in the ES to assess the risks. Mr Phillips confirmed that the ES has carried out an assessment of

risks that were known at the time. Mr Phillips explained that the effect on availability of flights was not considered to be a safety issue and operators do not operate unsafe flights. This is an issue regarding access to platforms and Spirit Energy has confirmed that to be correct. Mr Phillips added that the Applicant's position is that this is not about the safety of individuals on unmanned platforms. The probability of someone being stuck on a platform was low. The Applicant understood that in the last year alone there was only one occasion when a crew member was on a platform for longer than was expected. Mr Phillips explained that the Applicant's position was that Spirit Energy's concerns related to commercial operations and not safety.

- 4.12 Mr Phillips explained that the ALARP process was an iterative exercise that was not fixed in time but needed to be assessed on a weekly/monthly basis as part of ordinary course of business. Spirit Energy was already required to take account of changes for example to the environment or new ways of doing things and ALARP therefore imposed a continuing duty to consider an evolving measure having regard to HSE guidance, the risk posed, measures available and cost. Mr Phillips added that an operator was not always required to take all options that are available. For example, in circumstances where the risk reduction was not worth the cost.
- 4.13 Mr Phillips explained that Spirit Energy was suggesting that the Applicant should have to read a requirement to carry out an ALARP assessment into EN3 (when it was not there) and to base this assessment on a fixed point in time. It would also need to carry out the ALARP assessment based on a safety issue and not an access issue.
- 4.14 Mr Phillips confirmed that in the Applicant's view there are no significant risks associated with Hornsea Three that warrant mitigation. However, if there is a risk then the risks need to be quantified. Mr Phillips noted that Spirit Energy was suggesting that the test in EN3 could be met by the inclusion of protective provisions. However, the Applicant's position was that the test could be discharged if it concluded that no mitigation was required as there was no risk/adverse effect. The Applicant has therefore discharged the requirement in EN3.
- 4.15 Mr Phillips added that duty of coexistence cuts both ways and it doesn't mean that wind must "bow down" to oil and gas. It was not appropriate for proposals for known wind farms to be held back by speculative unknown oil and gas proposals. Mr Phillips explained that the whole area is subject to oil and gas licences and if this was the case then no wind farm development could be brought forward. Mr Phillips added that there has to be a point in time where project can have certainty to move forward.
- 4.16 In response to a comment made by Spirit Energy relating to MGN 543 and associated guidance, Ms Westwood explained that the Methodology¹ referred to (along with MGN 543) are the primary guidance for the NRA and this guidance is only intended for use for shipping and navigation impacts. The NRA has followed the ALARP principles and the MCA and Trinity House have confirmed that the methodology used for Hornsea Three is compliant.
- 4.17 Dr Emily Wood on behalf of the Applicant added that the Methodology and MGN 543 does not relate to aviation and the aviation guidance (CAP764) does not refer to ALARP.
- 4.18 In response to comments made by the ExA and Spirit Energy relating to the interpretation on EN3, Mr Phillips explained he did not dispute Spirit Energy's interpretation of paragraph 185 and if there is an adverse affect then substantial weight should be given. However, the issue here is that the parties do not agree on whether there will be an affect/effect. Mr Phillips confirmed that the Applicant had assessed all of the affects in the ES and had therefore discharged its duty. The Applicant has not therefore failed to comply with EN3 to date and the Applicant has

¹ Methodology for Assessing Marine Navigational Safety Risk of Offshore Renewable Energy Installations.

identified any risks. Mr Phillips added that the parties were all talking about the same risks and therefore the Applicant cannot be said to have failed to consider certain risks. For example, helicopter access to platforms, personnel on platforms, vessel collision risks have all been considered. The issue is that there is a difference of opinion of the level of risk. In respect of all of the policy documents, Mr Phillips reiterated that BEIS is seeking to achieve coexistence and balance. None of the policies are written to favour one industry over the other. Mr Phillips concluded that the issue here is that the Applicant has assessed the risks to be low and Spirit Energy rejects this.

4.19 **b) East Inshore and East Offshore Marine Plans**

4.20 In response to a question from the ExA, the Applicant and Spirit Energy confirmed that the proposed array is not in area of existing production and the most relevant policies are GOV2, GOV3 and OG2.

5. **AGENDA ITEM 5 – OIL AND GAS OPERATIONS – ALLISION RISK**

5.1 **a) Diversion of shipping routes**

5.2 In response to comments made by Spirit Energy regarding the assessment of the allision risk of vessels and oil and gas assets, Ms Westwood explained that the NRA is the output of a couple of years work but is based on over 10 years work for the Hornsea Zone. The Applicant has been consulting regularly with vessel operators and carries out a regular vessel review. Ms Westwood confirmed that the in-house data set covers 15 years of both infrequently and frequently used routes. The Applicant has organised hazard workshops attended by regular operators where they were able to feed their concerns and proposed mitigation into a hazard matrix. Ms Westwood notes that Spirit Energy's representatives attended the workshop along with DFDS (the main operator in the area). The Applicant has then assessed the route and predicted the impacts. Ms Westwood confirmed that the assessment complies with MGN543 and the methodology for assessing marine navigational risk. The methodology includes an appendix which lists the vessels and SAR impacts to be considered. Ms Westwood clarified that the Applicant is not saying that a vessel would never go through the array but that there are no cost or time benefits associated with going through it. Ms Westwood confirmed that the Applicant has assessed the internal allision risk.

5.3 In respect of the issue of a tanker in ballast going past J6A, Mr MacDonald on behalf of the Applicant explained there were a number of alternative routes that vessels can take. For example the Broken Well Banks channel is commonly used in the Southern North Sea and this had been observed from surveys. Mr MacDonald referred to the channels that are between existing wind farms such as Galloper and Gabbard (less than 2 miles) and Walney and Ormonde (2 miles traffic separation distance).

5.4 **b) Vessels not under command**

5.5 In response to a question from the ExA as to whether any barges already on station would remain until the weather improved, John Beattie on behalf of the Applicant explained that the operator of the vessel would look at typical weather wind patterns and forecast for a weather window. This means that the operator would wait for the most efficient window to carry out the works from start to finish. In the event that the vessel cannot return then it would seek to relocate to a safe area. The operator would take into account other assets such as those owned by Spirit Energy. Mr Beattie confirmed that the weather limits for a jack up barge are 10-13 m per second which is 20-25 knots.

5.6 Mr Beattie clarified that if the barge was already in the array then it can stay jacked up where it is or seek to relocate to a safe area. It would depend on the stage of construction.

- 5.7 Mr MacDonald added that very strict criteria for operating are established before the vessel sets sail. The vessel will be carrying equipment worth millions of pounds and there would be insurance implications for commencing if the weather conditions were not suitable.
- 5.8 In response to a question from the ExA relating to general supporting vessels, Mr MacDonald confirmed that these types of vessels would be moved out to a safe area.
- 5.9 In response to a comment from Spirit Energy regarding the need for a management agreement, Ms Westwood clarified that the traffic is very low within the Hornsea Three area.

6. AGENDA ITEM 6 – OIL AND GAS OPERATIONS – USE OF HELICOPTERS

- 6.1 In response to comments made by Ray Reynolds during Spirit Energy's slide presentation, Dr Wood explained that Spirit Energy had based its position on a very small weather minima where only ARA flights need to be adopted. The Applicant has presented existing approaches that are alternative to the ARA to the Spirit Energy platforms, which have been confirmed by CHC and the helicopter industry as both current and available. The regulations and weather minima within which these alternative approaches are flown has been confirmed by the helicopter operators. The Applicant therefore maintains its position, as it has been verified by the helicopter operators, that IMC conditions requiring ARA occur only a small percentage of time, (see Slide 1 of Spirit Energy's slide presentation (weather minima for day). It is only in a situation where the gap is between 200ft and 300ft that Spirit Energy would be constrained to ARA flights and these are only restricted in certain wind conditions. Dr Wood added that flights where the cloud is underneath 200ft are restricted anyway.
- 6.2 Mr Prior clarified that flights are restricted if the cloud is below 200ft during the day or 300ft at night. Flights are also restricted in some other conditions such as icing as none of the aircraft currently used by CHC have icing clearance. Dr Wood added that the en route descent is the preferred method and the circling ARA had not been considered. The Applicant had confirmed the common used method when the aircraft can't approach due to wind with the helicopter operators. Dr Wood confirmed that the Applicant would be willing to discuss the ARA circling approach further with Spirit Energy.
- 6.3 Dr Wood added that the en route descent is always a preferred approach when the weather permits. A shuttle from J6A platform to Chiswick or Grove, is always preferable for flights from Den Helder when weather permits.. The Applicant has also been made aware that ARA circling is an available and current approach which requires 2 – 2.5 nm and allows out of wind ARA approaches, and a final circle into wind within a 2 nm (or less) radius of the destination platform. Dr Wood confirmed that the Applicant would be willing to discuss the ARA circling approach further with Spirit Energy.
- 6.4 Mr Prior confirmed that the en route descent was the preferred route. The operator would transit out from base and approximately 20 miles out they would confirm on radar then descend. This was the quickest method and used the least fuel. Mr Prior confirmed that this method can be used to approach the platform from any direction. Whenever possible this would be the descent used and it required, by day, a 600ft cloud base and visibility of 4km.
- 6.5 Mr Prior explained that ARA approaches shown by Spirit Energy were historic and new technologies were being considered by the CAA. Mr Prior confirmed that the principle of ALARP is not an aviation term. Aviation has its own regulations which are based on prescriptive standards. The construction of Hornsea Three will not change the level of safety per flight. Instead it will result in slightly more limited access routes. Mr Prior confirmed that he was one of the authors of the HeliOffshore approach path management guidelines and it was designed for VFR approaches. It was not intended

for an ARA as this becomes an unstable approach as the helicopter maneuvers from the missed approach point to the helideck. Mr Prior explained that if the aircraft gets to the missed approach point it will turn crosswind and then back towards the helideck. If the crew have a choice they will make a visual approach. The approach path guidance is not used for a circling approach. If visibility is poor the crew will not want to trek out to 2 miles and 2 miles is just guidance for stabilising. Mr Prior confirmed that the minimum descent following an engine failure on take-off is 15ft not 35ft which applies to the 1st Sector Climb. Mr Prior added that the take-off from platforms is very dynamic. The operators have got to show that the probability of the engine failing during the take-off phase is 5×10^{-8} . If you then take into account the reliability of the AW139's engine and short exposure period there is an extremely small risk (1×10^{-9}). However, the Applicant has taken account of this worse case and considers that the operator can climb out to a safe distance under instrument flight rules.

6.6 Dr Wood explained that the figures on slide 27 showing turbulence as a defined distance from the turbines was unhelpful and not based on any evidence. The Applicant had undertaken significant research using its own internal helicopter team and the large amount of helicopter flights used by Orsted (used during both construction and maintenance) and none of the pilots had felt any turbulence that was significant enough to report. Dr Wood added that this was the same position taken by the CAA in that there were no mandatory occurrence reports related to wind turbines. Dr Wood explained that it was accepted that there is a wake effect from the turbines but that CAT and SAR helicopters are designed to be stable. They are used to experiencing turbulence from the platforms themselves and flying in and out of cloud. Dr Wood referred to the fact that there had been lots of studies using modelling data but that this had not been verified for any similar size or geometry turbines. In respect of the figures presented in CAP764 which had been superimposed on the slide by Mr Reynolds, Dr Wood explained that these relate to modelling carried out on very light aircraft which were not comparable to the helicopters used by offshore oil and gas or wind. Dr Wood reiterated that the experience of pilots flying between turbines every day was that there is no significant turbulence.

6.7 **a) Alternative flight paths**

6.8 In response to a question from the ExA regarding shuttle flights, Mr Prior explained that a shuttle flight was a short flight between two installations. For example, a flight stopped at the J6A platform then flew on to the Chiswick platform or Grove platform. In certain weather conditions a shuttle flight can be used for flights of less than 10 miles.

6.9 In response to a comment from Spirit Energy regarding the distance to fly to C6 and C7 from the J6A platform, Mr Prior explained that a flight could shuttle from the J6A platform to the Chiswick platform and then to C6. Mr Prior confirmed that such a shuttle flight could take place as low as 300ft provided it was clear of cloud and visibility was in excess of 2kms.

6.10 **b) Assessments of number of days when flights precluded**

6.11 In response to a question from the ExA regarding whether the assessment had changed from the ES, Dr Wood confirmed that the position has stayed roughly the same. The Applicant has re-evaluated the number of days that flights are affected considering the J6A data used by Spirit Energy. The results of the annual average percentage of days (using only the J6A data analysis) that ARAs are restricted (to either the Grove or Chiswick platform) by the presence of Hornsea Three is 1.1% (day) and 2.1% (night).

6.12 The 5% assumption of IMC has been re-evaluated and rather than apply the 5% across the year it has now applied a monthly value. The recalculated figures come out in a similar range, originally the assessment concluded that there would be 3.9 days

where flights are precluded to the Chiswick platform and now it is 2.17 days and 4.13 nights. Dr Wood confirmed that these figures would be put into a technical report. Dr Wood clarified that the monthly spread which is now available is more informative.

6.13 In response to a question from the ExA regarding the 5% figure for IMC conditions when direct ARA approaches would be required, Dr Wood explained that the 5% came from the met data analysis undertaken by Osprey and then refined by Orsted in house. The Applicant has submitted a full response at DL4 on that point [REP4-012]. The Applicant does accept that this is an assumption. However, the Applicant has recently obtained an 18 year data set from the Met office and verified this assumption. The average value obtained is [0.3 % during the day with a range of 0 to 9.4 % and (5.8% at night with a range of 0 to 18.2 %. Dr Wood explained that the Chiswick and Grove platforms were not enabled to fly at night at the time of drafting the ES so it did not take into account flights at night.

6.14 It is noted that the Applicant and Spirit Energy confirmed that the use of common weather data sets were agreed.

6.15 **c) Operational impacts of restrictions on helicopter flights**

6.16 In response to comments made by Spirit Energy relating to the number of flights available to fly to Chiswick platform, Dr Wood noted that this was initially 40, then 60 and that there was now a restriction on the number of flights which equates to 120 take offs per year. Unless there is a major upgrade to the fire fighting equipment on the flight deck then this restricts flights to 60 days per year. Dr Wood noted that flights are also restricted in any case by the weather. Hornsea Three is only potentially adding 3 further days of restrictions. Dr Wood therefore found it hard to believe that Hornsea Three will have such an impact on operations.

6.17 The Applicant notes that Spirit Energy confirmed that it has invested in and upgraded the platform and that it is permitted to have 120 unattended landings and unlimited attended landings, however the Applicant notes that this is not what is presently shown on the helicopter landing certification plates for the platforms.

6.18 **d) Safety impacts of restrictions on helicopter flights**

6.19 In response to a comment made by Spirit Energy on personnel being exposed to additional risk due to the potential for an increase in time spent on the platform, Dr Wood explained that the J6A platform is an accommodation hub and the Applicant cannot understand why Spirit Energy cannot shuttle personnel to J6A for overnight. Dr Wood also referred to the need to explore walk to work vessels especially if the use of helicopters was considered by Spirit Energy as such a high safety risk.

6.20 Mr Phillips and Mr Prior referred to the temporary refuge areas and the fact they must comply with HSE regulations and Mr Prior explained that the platform operator has to demonstrate that there is a good prospect of rescue under PFEER 17. For example, a helicopter cannot land if there is a gas escape, fire or lack of power. Similarly if person breaks an arm then an immersion suit cannot be used (and so a helicopter can not be used for evacuation). Mr Prior added that the MCA has conducted over 300 flights to assist bringing personnel off platforms who cannot be reached using commercial flights.

6.21 Mr Phillips added that it was not clear why there was a greater risk in light of the existing emergency protocols.

6.22 **e) Comparison with other locations**

6.23 Mr Prior advised that the Beatrice A is a manned platform that has been operating for over 10 years with two 500ft turbines at a distance of 0.8 nm from the platform. Mr Prior confirmed this was now not operational.

- 6.24 The Applicant agreed to provide a summary table setting out a joint position on the outcome on the analysis of the common data set (J6A data) and the assumptions used for Deadline 9.

7. **AGENDA ITEM 7 - EFFECTS ON FUTURE OIL AND GAS OPERATIONS**

7.1 **a) Whether (in principle) it may be appropriate for a DCO to make provision for co-existence with future oil and gas operations**

- 7.2 Mr Phillips confirmed that as a matter of principle it may be appropriate for protective provisions to make provision for future operations.

7.3 **b) Whether C6 and C7 proposals are sufficiently advanced to carry weight in this examination**

- 7.4 In response to comments made by Spirit Energy on its proposals for C6 and C7, Mr Phillips explained that on the basis of the evidence before the Examination the Applicant's position was that the proposals were not sufficiently advanced so as to carry significant weight. The Applicant was being asked to assess and take account of a project that was not in the public domain and not subject to external verification. Mr Phillips noted that Spirit Energy only mentioned the proposals at Deadline 1. The Applicant understands that a licence has been granted but this is the same licence for any licence block and some will not be developed and some will be surrendered. If every licence granted was a proposal then a developer could never take forward any competing offshore activity. This did not support the principle of co-existence. Mr Phillips explained that works could not yet commence and further consent steps still have to be taken. Mr Phillips queried how the Applicant could take into account a proposed project in its application if information relating to its location is only given during the Examination. Mr Phillips suggested that it would not be appropriate to hold back a wind farm for a project that may not come forward. Mr Phillips explained that the actions taken by Spirit Energy relating to the provision of information go to the credibility of the proposal. There was no mention of the proposal in the public domain until January 2019 and the Applicant considers that that was prompted by the Examination.

- 7.5 Mr Phillips confirmed that protective provisions were being offered but were not required due to the oil and gas clause. The oil and gas clause favours the oil and gas industry but only if the Government and the Crown Estate think it should be taken forward. Mr Phillips explained that the presence of the oil and gas clause is why it is rare to deal with these matters in the DCO.

- 7.6 In response to a question from the ExA, Mr Phillips confirmed that if the Secretary of State was of the view that oil and gas should be exploited, then the offshore wind farm would be required to decommission in part pursuant to the oil and gas clause (subject to compensation). However there are steps in between this and other mitigation measures such as proximity agreements would be explored first. Mr Phillips explained that it was up to the ExA and Secretary of State to decide whether the oil and gas clause is sufficient or if protective provisions are needed.

- 7.7 Mr Phillips added that the Applicant is negotiating proximity agreements with a number of other oil and gas operators to deal with cable crossings and it is not intending to deal with these by way of protective provisions.

- 7.8 In response to comments made by Spirit Energy relating to EN3 and the use of the Rochdale Envelope, Mr Phillips explained that the Applicant was not disputing the extent of Spirit Energy's licence and its exclusive rights but that the licence was subject to other provisions and consents. The Applicant had not seen the work plans referred to in the licence. In relation to the Rochdale Envelope approach, an EIA does not need to take into account speculative applications with no information in the public domain. Mr Phillips reiterated that NPS EN3 needs to be read as a whole and the

main point of those paragraphs is to achieve balance between the two industries. Mr Phillips concluded that it cannot be the intention of EN3 that for any offshore windfarms where the developer is proposing a wind farm in a licenced area that it can be stopped by an oil and gas proposal at any time between EIA to commencing construction. If so, the situation would be too uncertain for any offshore wind farm project to proceed.

- 7.9 In response to a suggestion from Spirit Energy that it could provide a solicitors statement confirming that Spirit Energy was progressing its plans, Mr Phillips explained that whilst such a statement may assist the private negotiations it would not assist the Examination as there would be no evidence made available to the ExA that could be tested.

ANNEX A: Shipping and Navigation Position Summary

Ali MacDonald, John Beattie, Samantha Westwood

Agenda Item 5. Oil and Gas Operations – Allision Risk

a) Diversion of Shipping Routes

Issue

Spirit Energy reiterated concerns that vessels could re-route to the south of the wind farm and then turn to the north towards the Grove platform. DNV estimated that on some passages between Humber and Germany re-routing to the south of Hornsea Three would be shorter than to the north. Also it was stated that vessels (e.g., Very Large Crude Carrier) may re-route to the south in northerly winds, or to the east of the wind farm in westerlies, to avoid being drift on to the turbines in the event of a breakdown. Finally, it was asserted a proportion of smaller vessels may be comfortable going through if turbines are aligned for them to do so.

Position

The Navigational Risk Assessment (NRA) uses the 'Methodology for Assessing Marine Navigational Safety Risk of Offshore Renewable Energy Installations (MCA, 2015)' and MGN 543 (MCA, 2016) as its primary guidance. The NRA identifies the existing vessel routing in the area using vessel based traffic surveys and extensive in house data sets, with post-wind farm vessel routing predicted based on guidance, consultation feedback and experience from existing offshore wind farms. It is anticipated that the net risk to Spirit Energy's Assets will reduce given that the number of (generally east-west) vessels passing in proximity to the Markham Assets is expected to reduce based on vessels re-routeing around the Hornsea Three wind farm.

Commercial vessels have never been observed to transit through existing wind farms and are not expected to do so given increased allision risks and additional navigational requirements, e.g., master may be required on bridge, transit at reduced speed as per COLREGS, etc. (Fishing and recreational vessels have been observed to transit through wind farms and this is expected for Hornsea Three.)

The re-routeing predictions for commercial vessels have been devised based on vessels taking the most economical, safe route post-wind farm development. This has been informed by before-and-after vessel traffic surveys carried out by Anatec over a number of years where vessels used to route through wind farms but now go round the outside, as well as by extensive consultation with Vessel Operators, such as DFDS, the main commercial operator in the area. DFDS provided actual passage plans, including adverse weather routes, as input to the NRA and confirmed they would instruct all Masters as part of their Standing Orders to avoid the wind farm. Overall, most vessels are expected to re-route north with a minority re-routeing south of the wind farm.

In northerly winds, the adverse weather passage plans provided for vessels heading generally north-south indicated that they take a more coastal, inshore route to obtain shelter before crossing much further south, well clear of Hornsea Three. This is also anticipated for larger tankers which are known to use the Valiant Channel, an established deep water passage between the Well Bank and Broken Bank, when crossing the Southern North Sea. There will also be a 3.9 nautical mile channel between Hornsea One / Two and Hornsea Three which is designed for use in all weathers. This channel was agreed with the MCA and Trinity House, and

is wider than some channels between other wind farms, such as Walney and Ormonde in the East Irish Sea.

Therefore, vessels are expected to route farther from the platforms based on their destinations as well as adherence to adjacent international routing measures. This is in-line with MCA guidance on offshore renewables projects (MGN 372: Guidance to Mariners Operating in the Vicinity of UK OREIs) which states that "where there is sufficient sea room it is prudent to avoid the area completely". Our experience from a vast number of surveys has shown this to be the case.

With respect to Spirit Energy's concern about vessels routing around the south of Hornsea Three and then turning north east towards the Grove NUI, this scenario is considered to be extremely unlikely as most eastbound vessels are expected to re-route to the north of the wind farm. Also any vessels passing to the south are not expected to make a sharp turn to the NE immediately after passing the wind farm as it is not the most efficient route. If a vessel were to make a turn after reaching the SE edge of the wind farm, because it had planned its passage accordingly to take into account the wind farm, it is highly likely that it would also consider Grove which has been installed and on charts since 2007. It is illegal for a Master to transit within 500m of an oil & gas platform.

A number of allisions (and groundings) have taken place where a vessel failed to change course according to their passage plan due to fatigue or absence from the bridge. However, for an allision with Grove to take place it would require the Master (or Officer) to turn the ship onto a collision course immediately after passing the wind farm and then fail to answer the warnings from the J6A Control Room when this action generates an alarm from their Radar / AIS monitoring system.

In their Full Written Representation of 7 November 2018 (EN010080-001197-Spirit Energy First draft rep; Section 5.8), Spirit Energy stated that in order to mitigate their perception of increased risks from third-party vessels, "*the current ARPA and AIS warning systems will need to be upgraded to a predictive radar early warning system (REWS). Further work is however required to verify the effectiveness of such a REWS in operating in close proximity to turbines of the size and density proposed by the Applicant.*"

At a meeting between Spirit Energy, Ørsted and radar experts on 1 March 2019 in Hoofsdorp, Netherlands, it was confirmed that in fact J6A already has a predictive REWS. The radar experts were of the opinion that the existing system would be able to track vessels within and beyond the wind farm on both Radar and AIS and hence provide the necessary alarms should any vessels be on a collision course. It would also be straightforward to introduce a new alarm to warn of any vessel turning NE towards Grove after passing south of the wind farm. Therefore, the mitigation proposed by Spirit Energy is already in place with only a minor software update required and trials undertaken following construction.

b) Vessels not under command

Issue

Spirit Energy have expressed concerns that third-party passing vessels and vessels associated with the wind farm could lose power, drift (not under command) and contact one of their platforms, in particular Chiswick which is closest to the Hornsea Three site.

Position

In terms of passing ships, as discussed under Item 5a), re-routing around the wind farm is expected to increase their average passing distances, meaning that the risk is lowered as vessels

will spend less exposure time in proximity to the platforms. (Fishing vessels are assumed to be able to keep operating inside the array.) It is noted that there have been no known vessel allisions (contacts) with oil & gas platforms on the UKCS to date caused by a third-party vessel losing power and drifting not under command.

The wind farm will introduce new vessel traffic in the area, especially during the temporary construction phase, however, this will normally be remote from the platforms. Even a vessel working at the extreme eastern edge of the site will be 1.5 nautical miles (c. 3km) from Chiswick.

Strict procedures will be in place to mitigate the risk of a drifting incident as the highest risk will be to the wind farm structures within a few metres, rather than remote oil & gas platforms. Vessels will be vetted, audited, monitored, etc., and required to follow strict operating procedures including allowable weather limits.

Example principals provided by an experienced Ørsted installation specialist are as follows:-

- Prior to departing from the loadout port the vessel master will have to have a sufficient weather window to make the port departure, transit, as well as position the vessel at the foundation and jack to survival height (taking into account storm survival).
- The weather window for this will include a 50% contingency, so for a 10hr transit time there will need to be a total weather window for 15hrs.
- During the above mentioned "total weather window" the significant wave height (Hs) and the wind speeds (W/S) at 10.0m above water line will not be higher than the sea fastening design criteria. This is dictated by many factors, the vessel's natural characteristics, the turbine components weight, etc.
- At the expected arrival time at the foundation the master has to have the right environmental criteria (significant wave height, Hs, and wind speed) to position and jack up, which could take up to 12 hours. Current limits are around 1.8m Hs and 13m/s (approx. 25 knots).

Spirit Energy indicated they felt that these issues could be managed to the benefit of both parties through communications, a Cooperation Agreement and Construction Management Plan.

ANNEX B: Aviation Summary Position Statement

- 1.1 The Applicant has undertaken aviation assessments within the Environmental Statement that comply with the EIA regulations and have regard for the Overarching National Policy Statement for Energy (EN-1), National Policy Statement for Renewable Energy Infrastructure (EN-3) and CAP 764.
- 1.2 Section 8.11, Volume 2, Chapter 8: Aviation, Military and Communication of the Environment Statement (APP-113) presents an assessment of whether the project results in a change to the ability to carry out operations safely, and has taken consideration of EN-3, paragraphs 2.6.183 and 2.6.184, in that no unacceptable risk has been introduced by Hornsea Three.
- 1.3 The Applicant has identified a restriction in the ability to conduct straight in Airborne Radar (ARA) approaches (including the ability to carry out a Missed Approach Procedure or One Engine Inoperative (OEI) in certain weather conditions to the Spirit Energy operated assets. Aviation regulations ensure risk is managed for each planned flight and the helicopter operator will only fly within these regulations. The project may result in the requirement not to fly, or to fly a different flight path, but always within the regulations, therefore resulting in no change to safety risk.
- 1.4 The Applicant met with Spirit Energy on 17 December 2018 to progress the technical discussions in regard to aviation (see Applicants response to ExA Q2.5.17 at Deadline 4). One of the outcomes was a table of the fundamental aviation assumptions used to underpin both the Applicant's and Spirit Energy's assessments which was provided to Spirit Energy in order to facilitate agreement on the aviation assessments (see Appendix 31 to the Applicant's response to Deadline 4). An action also arose from the meeting on the Applicant to consult with the North Sea helicopter operators to discuss the Applicant's assessment and the helicopter approaches that can be used to access the Spirit Energy platforms. to work towards both a common understanding of the respective parties' assessments and to provide assurance to Spirit Energy that the two companies can mutually co-exist.
- 1.5 The Applicant and Spirit Energy (represented by Aviateq) met with CHC (the operator currently contracted by Spirit Energy to fly to Chiswick, Grove and J6A platforms on February 21, 2019. A summary of the meeting has been agreed by CHC and is submitted at Appendix 29 to the Applicants response to Deadline 7.
- 1.6 The Applicant also hosted an aviation workshop on February 27, 2019 attended by Spirit Energy and the helicopter operators CHC, NHV, Bristows, Babcock and Uni-Fly . A summary of the meeting is currently being reviewed by the helicopter operators and is submitted in draft form at Appendix 30 to the Applicants response to Deadline 7.

- 1.7 The Applicant sought to explain why their assessment and that of Spirit Energy differ so significantly (see the Applicants response to Ex.A Q2.5.14 at Deadline 4). The Applicant advises that there are four fundamental differences which require attention. The first difference is in the application of the regulations and the assumptions used to underpin the assessments, fundamentally the application of the European Aviation Safety Agency (EASA) regulations by the Applicant, which provide the legal basis for aviation operations in Europe, as opposed to the Oil and Gas helicopter guidance document referred to by Spirit Energy, the International Oil and Gas Aviation Management Guide (IOGP AMG). The outcome of the CHC meeting and aviation workshop confirmed that the regulations used by the Applicant are correct and that the guidance provided in IOGP AMG is not used by CHC when contracted to Spirit Energy, nor is Spirit Energy a member of IOGP. The regulations that should be used to underpin the assessments are indeed EASA as used by the Applicant and not IOGP as used by Spirit Energy.
- 1.8 The Applicant advises that the second difference is the difference of opinion that there are alternative flights to a straight in ARA that can be flown within the EASA regulations; namely an en route descent and a shuttle flight which both can be used to provide safe access to the destination platforms.
- 1.9 The meeting with CHC and the aviation workshop confirmed that the En route descent as put forward by the Applicant and not considered by Spirit Energy, is the preferred approach to an ARA when the weather conditions permit.
- 1.10 It was confirmed that a descent (by day) using the radar for obstacle avoidance whilst IMC, is made to 500 ft with a cloud base not below 600 ft and then flown in VMC below cloud. This enables an approach to be made from any wind direction to the Chiswick and Grove Platforms, as long as there is VMC between 600 ft and the surface.
- 1.11 The meeting with CHC and the aviation workshop confirmed that shuttle flights as put forward by the Applicant, and not considered by Spirit Energy, can be, and are routinely flown from the J6A platform to the Chiswick and Grove platforms, for flights originating from Den Helder when routing via the J6A platform.
- 1.12 An ARA can be made to the J6A platform and from there, shuttle flights can be flown to the Chiswick and Grove platforms as these platforms are less than 10 nm from the J6A platform and so are within the regulations for shuttle flights. The IMC conditions for shuttle flights (by day) are for a cloud base as low as 300 ft and visibility of 2 km.
- 1.13 In the instances when an ARA is required the helicopter operators reported that a circling ARA could be flown. This allows the final segment of the ARA to be flown out of wind, and a circle into land at a final approach fix of up to 2 nm (VMC approach for night) to be made. This would be possible at the Grove platform if a visual fix could be made at 2 nm which would reduce the restriction on ARA flights further at this platform. The Applicant has prepared a circling ARA footprint which is currently being consulted on with the helicopter operators.
- 1.14 The footprint prepared assumes that in poor visibility, as with shuttling, the visibility can be as low as 2km and so the pilot would not want to go out to 2nm as a matter of course. Once the pilot has got past the missed approach point, and has the required visual cues, they are VFR and therefore a 1 nm buffer has not been applied to the circling ARA approach but a 500 ft (VFR) buffer has been applied.

- 1.15 With regard to Missed Approach Procedures, the Applicant notes that Spirit Energy's consultants have conducted a missed approach by flying an offset from 1.5 nm which results in an initial 10-degree turn, followed by a 30-degree turn. They then climbed on track to Minimum Safe Altitude (MSA). They did not consider the potential to make a further turn once established in the climb and once go-around checks were complete (Paragraph 10.4.2 of the Flight Evaluation Report submitted by Spirit at Deadline 1; REP1-193). This is not how a missed approach would be conducted knowing the location of the turbines.
- 1.16 The Applicant also notes that Spirit Energy's consultants have conducted an OEI scenario in a straight line (with one maximum turn of 30°) and again not considered the potential to make an initial turn stabilise and make further turns (Paragraph 10.3.1 of the Flight Evaluation Report submitted by Spirit Energy at Deadline 1; REP1-193).
- 1.17 The Applicant has noted that there are restrictions on missed approach procedures / OEI in certain weather conditions however as the pilot can fly left or right with a turn of greater than 30° this is not considered to be outside the restrictions presented for ARA approaches.
- 1.18 The Applicant has noted Spirit Energy's concerns with regard to departures from the Chiswick and Grove platforms. The Applicant has, at the request of Spirit Energy, calculated the footprint of a departure from Chiswick Platform directly to towards Hornsea Three array with engine failure at departure from helideck. The Applicant has calculated worst case distances for this scenario (the calculations used are included Appendix 36 to the Applicants response to Deadline 7.) and for which a footprint is currently being tested with the helicopter operators.
- 1.19 The Applicant has calculated a required distance of 1.81 nm for the worst-case scenario with a headwind of only 10 kt, taking-off at a mass of 6400 kg and an engine failure occurring on rotation from the helideck. The applicant considers this a remote scenario (which has not occurred in the North Sea) as the helicopter operators are required to demonstrate, through a combination of engine reliability data and usage monitoring, that the probability of an engine failure during the short Exposure Time is $<5 \times 10^{-8}$. This worst case requires a separation distance of 2.8 nm if including an IMC separation distance of 1nm.
- 1.20 The Applicant advises that the third main difference between the Applicant and Spirit Energy is in consideration of when ARA flights are actually required to be flown, i.e. when the IMC weather minima requires ARA and not another type of approach.
- 1.21 The Applicant has therefore validated the assessment of ARA to Spirit Energy platforms considered in ES against meteorological data from the J6A platforms (J6A data) provided by Spirit Energy (Appendix 21 to the Applicants response to Deadline 7.).
- 1.22 The Applicant has also analysed the IMC weather minima requiring ARA approaches using an 18 year Met Office data set for the closest Met Office monitoring station (Platform 62145 at location 53.1°N 02.8°E) in the southern North Sea (Appendix 21 to the Applicants response to Deadline 7).
- 1.23 The meteorological criteria which have been applied to determine flight operations is illustrated schematically in Figure 1 (day) and Figure 2 (night).
- 1.24 IMC conditions requiring an ARA is considered by the Applicant as the weather minima when VFR, en route and shuttle flights are not available, and outside of the current restrictions due to weather (cloud base and visibility), sea state, wind speed and icing conditions.

- 1.25 The results of the annual average percentage of days that ARAs are restricted (to either the Grove or Chiswick platform) by the presence of Hornsea Three is 1.1% (day) and 2.1% (night).
- 1.26 The analysis using the J6A data has demonstrated that the IMC criteria of 5% as used by the Applicant in the ES is comparable to the IMC annual average criteria derived from the J6A data set (one year) and from the Met Office data set (18 years). There is a greater range in IMC conditions when monthly data is analysed.
- 1.27 The analysis has demonstrated that by applying the J6A data IMC criteria, the revised results for the analysis in the ES provide a comparable total number of day that ARA flights may be restricted to the Chiswick and Grove platforms as a result of Hornsea Three. as shown in the Tables below.

Restricted ARA to Chiswick platform due to presence of Hornsea Three

Data source	Monthly minimum (days/month)	Monthly maximum (days/month)	Annual Average (days/year)
Environmental Statement data	August 0.17	April 0.4	3.49
Revised analysis J6A data (day)	Feb/March 0	April 0.76	2.37
Revised analysis J6A data (night)	Feb 0	April 1.47	4.13

Restricted ARA to Grove platform due to presence of Hornsea Three

Data source	Monthly minimum (days/month)	Monthly maximum (days/month)	Annual Average (days/year)
Environmental Statement data	August 0.12	April 0.25	2.18
Revised analysis J6A data (day)	Feb/March 0	April 0.47	1.78
Revised analysis J6A data (night)	Feb 0	April 0.9	2.49

- 1.28 The results from the J6A data show that ARA flights to the Chiswick platform are restricted by the presence of Hornsea Three (for day) for approximately 0 to 0.76 days per month (up to 2.17 days per year) which is less than the value reported in ES (i.e. up to 3.49 days per year) and so this restriction is considered to remain a low occurrence.
- 1.29 The results from the J6A data show that ARA flights to the Chiswick platform are restricted by the presence of Hornsea Three (for night) for approximately 0 to 1.47 days per month (up to 4.13 days per year). A night value was not reported in the ES as flights were not authorised to the Chiswick or Grove platforms at the time of submission of the ES. This value is considered a low occurrence.
- 1.30 The results from the J6A data show that ARA flights to the Grove platform are restricted by the presence of Hornsea Three (for day) for approximately 0 to 0.47 days per month (up to 1.31 days per year) which is less than the value reported in the ES (up to 2.14 days per year) and so this restriction is considered to remain a low occurrence.

- 1.31 The results from the J6A data show that ARA flights to the Grove platform are restricted by the presence of Hornsea Three (for night) for approximately 0 to 0.9 days per month (up to 2.29 days per year). A night value was not reported in the ES as flights were not authorised to the Chiswick or Grove platforms at the time of submission of the ES. This value is considered a low occurrence.
- 1.32 The Applicant advises that the fourth main difference between the Applicant and Spirit Energy is the consideration of the actual operational effect of the IMC restrictions to flights in certain weather conditions, considering the normal operational requirements to these assets and the restrictions imposed on them already.
- 1.33 The Applicant maintains that the restrictions are in regard to an operational effect and not a safety restriction for the following reasons. The Applicant notes that the assets are not considered to require 24/7/365 helicopter access, the helidecks were not certified for night operations until recently for Grove platform, and as Normally Unmanned Installation (NUI) are unmanned fail-safe platforms which can be controlled remotely. Helicopters are not considered the primary means of evacuation. The Applicant advises that helicopters cannot be used when there is a hydrocarbon release or a fire, i.e. the two major types of emergency on a NUI. In the event of an injury, personnel can be rescued by SAR helicopters which operate to a greater range of weather conditions and which have appropriately trained and equipped crewmen. CAT helicopters cannot be used to transport seriously injured personnel as they do not have the trained crew or equipment.
- 1.34 The Applicant advises that helicopters are not used to show compliance with PFEER 17 at a NUI as their response time, unless based offshore, is not sufficiently quick. The standby vessel at the J6A platform will be Spirit Energy's means of showing a "good prospect of rescue" under PFEER 17 (HSE 2019).
- 1.35 The Applicant is in agreement with Spirit Energy that there will be incidents on a platform which are not an emergency (Spirit Energy response to Q2.5.16 at D4). The Applicant does not consider that there is a high potential for this to arise when personnel cannot be transferred back to the J6A platform by a shuttle flight. The Applicant has also been made aware in a consultation meeting (1 March 2019) that for instances of potential vessel collision the evacuation procedure from the Chiswick and Grove platforms is to a life boat.
- 1.36 For personnel being left on a platform this is considered a comfort issue and not one of safety as the platform must comply with HSE regulations for a safe place of refuge.
- 1.37 The Applicant is aware that planned maintenance activities will be able to proceed to the Chiswick and Grove platforms, potentially with minor adjustment to schedules to allow for any restrictions imposed by Hornsea Three. Planned activities can also proceed using alternative methods such as walk to work vessels, which are available to Spirit Energy. The Applicant notes Spirit Energy's concern in regard to unplanned maintenance and that when faults occur the platforms will not be allowed to become unsafe and instead production will be curtailed or shut-in completely until personnel can be mobilised to the platform to effect a remedy (Spirit Energy response to Q2.5.16 at Deadline 4). The Applicant does not consider that the frequency of unplanned visits, which are critical to the platform not being shut in, can be so high that a 1 % restriction in access has a material effect on the ability to conduct these visits.

- 1.38 Regarding future activity in the Markham field, the Applicant has been made aware of two new well locations to the west of the Chiswick platform. The Applicant notes that Spirit Energy have submitted that access to their existing subsea wells is by vessel (paragraph 4 of Spirit Energy written submission at Deadline 3;REP3-030). The Applicant has made in the spirit of coexistence an offer to Spirit Energy of a buffer around the proposed C6 and C7 wells of 1nm. This will enable the Applicant to be able to design the final layout with certainty and would provide Spirit Energy with access for their drilling activities via vessel and via helicopter in VMC.
- 1.39 In order to address the differences between the Applicant and Spirit Energy the Applicant has made, in the spirit of co-existence, an offer to Spirit Energy of a 2.8 nm exclusion zone around the Chiswick platform to enable a greater degree of flexibility for both approaches and take offs from the platform. This will resolve the issues presented by Spirit Energy in regard to take offs with a worst-case scenario of engine failure at take-off, and in regard to one engine inoperative and go arounds for approaches to the platform. This will also enable circling ARA approaches to be made to the Chiswick platform when the weather permits, (as well as the ability to continue flying ARA (with restrictions due to wind direction), en route descents and shuttle flights when the weather permits).
- 1.40 Further, the Applicant has met with Spirit Energy on 13 March 2019 to discuss the data analysis undertaken by the Applicant and Spirit Energy in order to work towards a common method of analysis such that an agreement can be reached on the percentage of flights potentially restricted by Hornsea Three. The outcome of this meeting is presented in Appendix 44 to the Applicants response to Deadline 7). The meeting provided a useful alignment of the application of weather minima and the availability of flights and provided an understanding of the differences in the output of the analysis on the number of days affected by Hornsea Three.
- 1.41 The Fundamental differences in the data are due to Spirit Energy assuming a 9-hour available shift pattern is required. The Applicant does not consider shift patterns can be realistically applied to the data set (considering the data is at 3-hour intervals). The data set is not sufficiently robust to calculate this with accuracy.
- 1.42 Spirit Energy has considered a restriction on the availability of VMC flights due to proximity with Hornsea Three. They have considered a requirement for VGA flights requiring 2 nm. The Applicant is not in agreement with this approach as they consider that the industry requirement for VGA flights to be 1 nm with a stabilisation point at 0.5 nm. This difference would however fall away on application of the separation distance proposed by the Applicant.
- 1.43 Spirit Energy has considered a restriction on take offs due to the proximity with Hornsea Three. The Applicant has considered that distance is not a limiting factor due to the separation distance proposed by the Applicant.
- 1.44 The Applicants position is that good agreement has therefore been made on agreeing the assumptions used to underpin the assessments and on the availability of different approaches and take offs from the platforms. The Applicant will refine the data to align with the discussions had with Spirit Energy for the next submission, however the total number of days is not anticipated to vary significantly from that submitted by the Applicant (Appendix 21 to the Applicants response to Deadline 7).

Figure 1: Illustrative slide illustrating the confirmed weather minima in which an ARA approach is required to be flown by day.

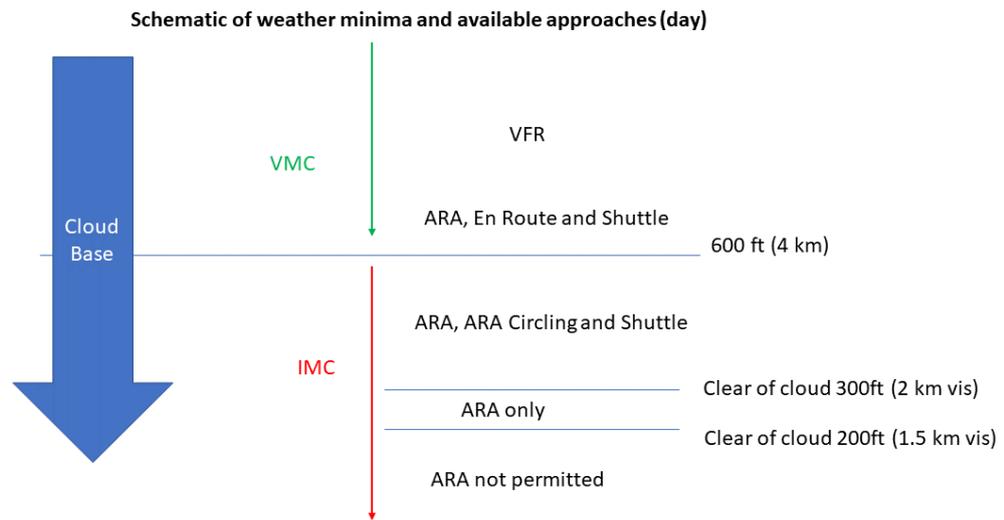
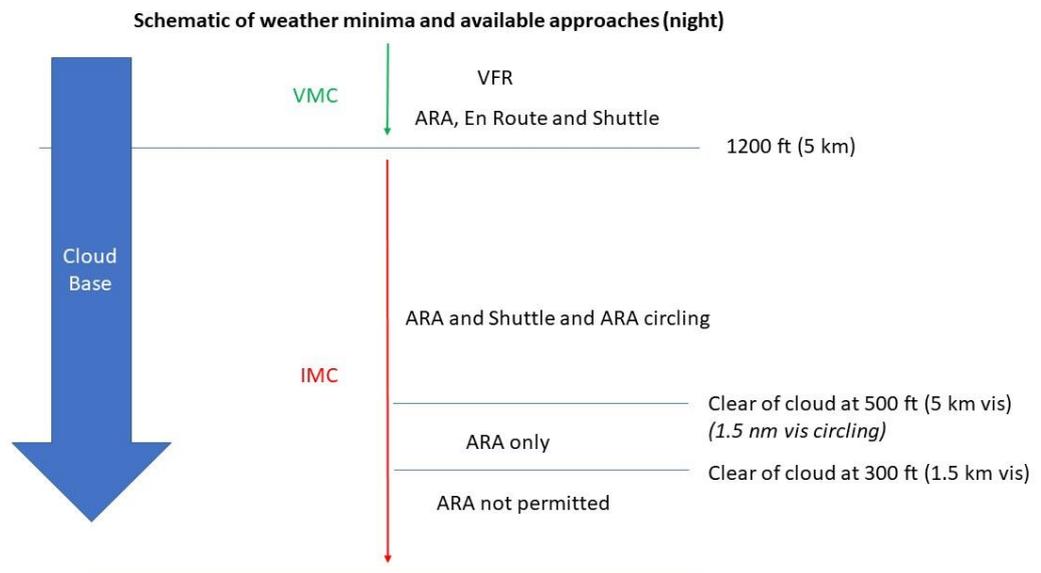
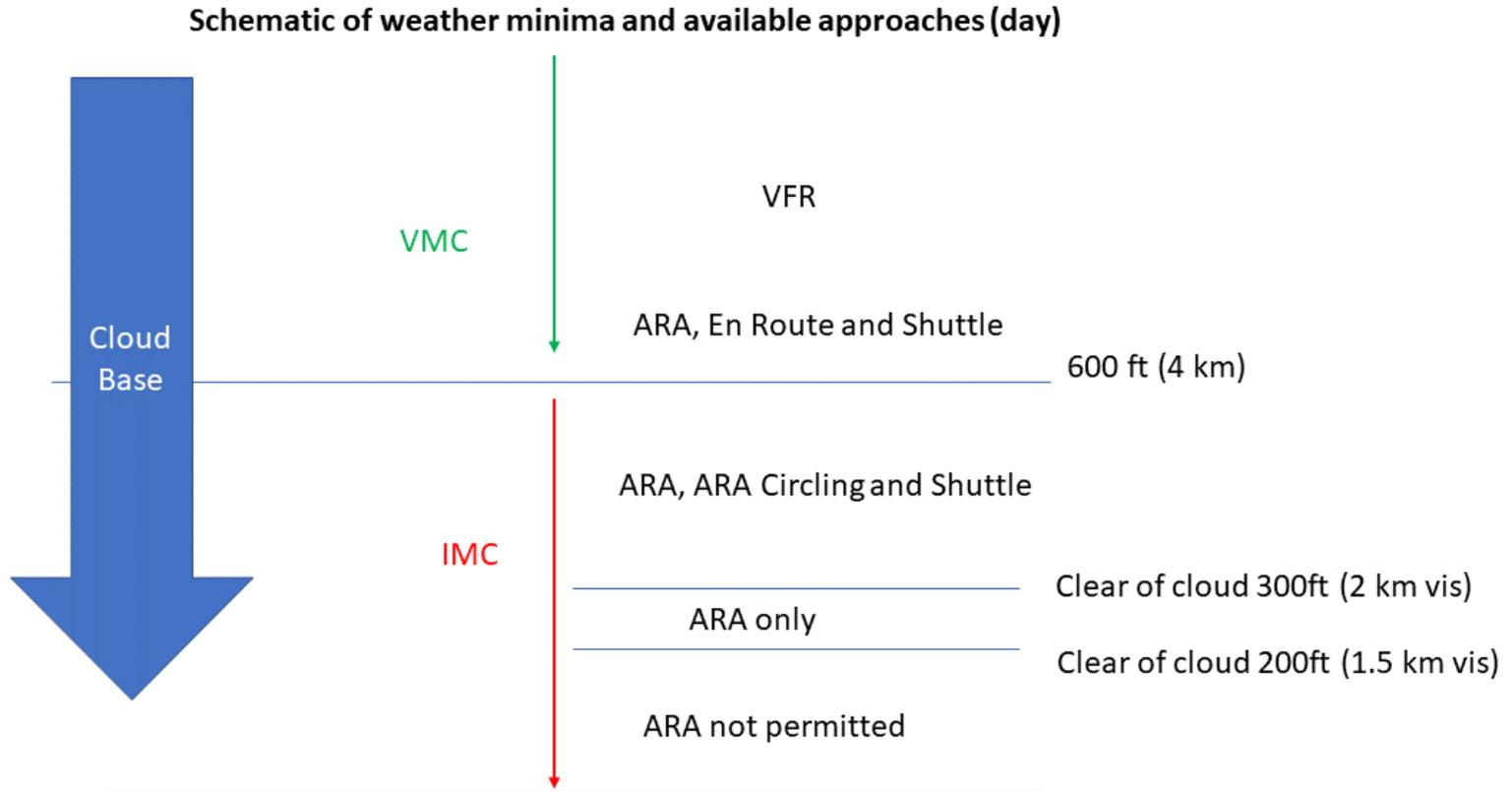


Figure 2: Illustrative slide illustrating the confirmed weather minima in which an ARA approach is required to be flown at night.



ANNEX C: Schematic showing weather minima and available helicopter approaches (day)



Annex D: Notes on Spirit Energy slides provided by Mark Prior

Slides 1&2: No comment.

Slides 3,4 & 5: No comment, this slide is a repeat of EASA text

Slide 6&7: These slides are showing restricted ARA flights from the west which is as submitted by the Applicant.

Slide 8: Slide shows turbines removed to 5 nm and a flight path tracking to a 4 nm FAF. This exclusion has not been discussed with the Applicant and the ARA approach shown has not been discussed with the Applicant or during any aviation consultation meetings.

Slide 9:
No comment, this slide is a repeat of EASA text

Slides 10&11: This makes the point that the max tailwind for an ARA in the AW139 is 20 kt.

Slide 12: This slide tries to make the point that a downwind ARA might not be possible in strong easterly winds. The Applicant will consider looking at the percentage of time that this actually occurs, i.e. cloud base <400 ft (no shuttle) and wind from the east with a tailwind component >20 kt which is probably a very small percentage.

Slide 13: The Applicant wishes to advise that a stabilised approach is for a visual approach only. Ironically an ARA results in an unstabilised approach when turning from the MAP towards the helideck.

Slide 14: This slide shows no lateral scale. The penultimate red dot at 200 ft should be 1/2nm from the platform. This is the critical point of the VSA. The rest of the points are only to line up with that 200 ft point. Spirit Energy referred to 2nm when the final descent starts, but that only applies at night, it is 1nm by day.

Slides 15,16,17,18: The Applicant advises that if you are circling off an ARA you are not then going to fly out to 2nm to set up for a gate at 1/2nm. The reason you are doing an ARA is low cloud and poor visibility, a circling approach needs to keep the deck in sight and flying in the opposite direction to 2nm will not do this.

Slide 19: The Applicant notes this shows a circling approach tracking out to 2nm. If you had to do an ARA you would not circle out to 2nm unless the visibility was good. If the visibility was good then you do not need the 1nm IFR buffer. Also, the HO guidance recommends a 1nm finals. The Applicant notes Spirit Energy are trying to merge IFR and VFR requirements to increase the distance to 3.3nm.

Slide 20: No comment

Slides 21,22,23,24: The Applicant notes that 35ft min clearance should be 15ft for all types as it is in the acceleration to V_{toss}. 35ft applies to the 1st sector climb. It does not make the point that an engine failure in the first 9 seconds is improbable.

Slide 25: The applicant notes this shows the required distance as 2.81nm including a buffer. The Applicant notes this is the value calculated by the Applicant which is with a full passenger load and sufficient fuel to fly to Den Helder, Norwich or Humberside with reserves. 2.81 nm applies to a 6.4 tonne take-off in the AW139, which gives them sufficient fuel + reserves and a 1400kg payload. So they can have 12 passengers at 100kg each and 200 kg (max capacity of AW139 baggage bay) of freight plus sufficient fuel. Furthermore, most NUI staff shuttle from the J6A platform, the helicopter could refuel there after dropping off the NUI passengers.

Slide 26: The Applicant notes this is a repeat of slide 25 with a turn shown.

Slide 27 & 28: See comments on slides 27 and 28 in regard to turbulence below.

Slide 29: The Applicant will consider a simulator trial if this is deemed appropriate at the time and is organised in a scientific and rigorous manner to obtain repeatable data.

Comments on slides 27 and 28 in regard to turbulence presented by Emily Wood

- The Applicant notes that Spirit Energy have superimposed a picture depicting the wake effect from a turbine taken from CAP 764 and superimposed this onto the figure with a supposed scale of some 1.5 nm. The Applicant states that this is unhelpful as there is no basis for this scale. The Applicant wishes to advise that yes there is a known wake effect from a turbine, however what is of importance is the level of effect that this has on a CAT and SAR helicopter, machines designed and built to be stable and flown in weather induced turbulence, and used to the turbulence created from oil and gas platforms.
- Ørsted is the market leader in the offshore wind industry with 18 operational wind farms and 6 offshore wind farms under construction. As such Ørsted has an internal aviation group within the company which is managed by a team of 4 aviation experts who manage the aviation contracts serving these wind farms.
- Helicopters are used during both the construction and operation and maintenance phase of wind farms in the UK and overseas. Ørsted uses helicopters to transport equipment and personnel during construction and operational and maintenance activities, both to the transformer substations with the array and to the turbines themselves where they undertake hoist operations during maintenance activities.
- Ørsted are in the process of constructing Hornsea Project One which will have their first offshore accommodation platform equipped with a helideck located within the Hornsea Project One array. Ørsted are currently in the process of developing flight plans for helicopter access to this platform for personnel transfer.
- The largest scale wind turbines that Ørsted presently operate are 8 MW with a rotor diameter of 164 m. Ørsted pilots and contracted helicopter operators have unparalleled experience operating within and around wind farms. The Ørsted aviation group have not had any reports of the wind turbine induced turbulence having a significant effect on any of their flights. The pilots report that the effects have not been significant enough to interfere with the stability of flight or the ability to conduct stable approaches, so as not to require reporting.

The Applicant has prepared a position statement on turbulence which is submitted at Deadline 7 to provide assurance in this regard.