

# **SPIRIT ENERGY**



## **DEADLINE 10 – SUPPLEMENTARY POSITION STATEMENT IN LIGHT OF SIMULATOR TRIAL RESULTS**

**2 APRIL 2019**



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## **1 INTRODUCTION**

- 1.1 At Deadline 10, Spirit Energy submitted a revised set of proposed Protective Provisions reflecting its evolving position in light of early feedback from the helicopter simulator trials which took place on 31 March 2019, and which were referred to in the Joint Statement of the parties submitted at Deadline 10.
- 1.2 Having now received the analysis and conclusions of those trials (**Appendix 4**), Spirit Energy has prepared the following updated Position Statement which represents its final position to the Examination Authority and to the Secretary of State for Business, Energy and Industrial Strategy.
- 1.3 Accompanying the Position Statement are the **Appendices** listed in section 3 below.

## 2 SUPPLEMENTARY POSITION STATEMENT

### Summary of Spirit Energy Written Submissions

1. Spirit Energy has made Written Representations from the outset of the Examination Hearing and consistent with its having raised on 19<sup>th</sup> September 2016 and again on 20<sup>th</sup> September 2017<sup>1</sup> its real concerns about its ability to maintain safe operations resulting from the future presence of large wind turbines in close proximity to the west of existing Spirit Energy infrastructure and any future exploration vessels and activities which will be at greater risk of vessel allision (displaced vessels impacting upon gas infrastructure) and will experience additional constraints on movement of personnel required for operations (due to restricted helicopter access and egress).
2. In particular, despite having raised concerns in September 2017 about the “risk assessment methodology” then adopted by the Applicant and the “incorrect evaluation” (methodology) undertaken by the Applicant, the Applicant continues in April 2019 to refuse to execute the requirements of EN-3 paragraphs 2.6.156 (ALARP) and 2.6.183 (risk reduction to as low as reasonably practicable) placed on it to reduce these recognised “potential affects” on its offshore infrastructure and activities – risks - to as low as reasonably practicable. It is now too late for the Applicant to discharge the expectation and requirement placed upon it, other than within the clear parameters of Spirit Energy’s proposed Protective Provisions (1).
3. The ExA identified early on a difference in the approaches of the Applicant and Spirit Energy. The heart of that difference lies in the *EIA-based* approach adopted by the Applicant as opposed to the (correct) *risk-based* approach adopted by Spirit Energy. Spirit Energy has previously submitted that the basis of the difference in the approach to consideration of offshore infrastructure lies in EN-1, paragraph 4.2.11 where Parliament expressly *separates* an EIA-based assessment *from* other (non EIA-based) types of assessment approaches provided for in EN-1 and EN-3 by defining the meaning of certain terms (“effects”, “impacts”, “benefits”) but not others (“affects”, “risks”). Spirit Energy considers that, in relation to the inter-relationship of offshore petroleum infrastructure and activities with proposed renewable infrastructure, Parliament’s EN-3 express scheme of paragraphs 2.6.179 to 188 is clear and adopts as a risk-based approach (paragraph 2.6.179 “potential to affect”; paragraph 2.6.183 “potential affect”; “risks”) underpinned by the paragraph 2.6.181 requirement to ensure successful co-existence. The assessment of such affects and risks is not excluded by an EIA-based approach to whether or not they are assessed as “likely significant effects” because paragraph 2.6.184 deems “likely affects” to be “adverse effects” and specifies the weight attributable to them. Parliament anticipates measures to resolve sufficiently such weighty risks. The Applicant disagrees and rewrites “affects” and “risks” to equate to the different words specified in paragraph 4.2.11 of EN-1 so that it seeks to exclude from all consideration factors that (in EIA terms) it has not categorised as likely significant effects (as it judges them to be moderate adverse effects only). Spirit Energy rebuts this contention by noting that the Planning Act 2008 provisions prevent the questioning of the merits of the NPSs following Parliament’s resolution and the Applicant’s approach (if correct) would result in avoidance of the EN-3 scheme of risk-based decision taking and paragraphs 2.6.179 and 2.6.183 superfluous.
4. At the same time as resisting risk-based assessment of Spirit Energy assets and activities, the Applicant has offered no explanation for the use of ALARP risk-based terminology in the relevant sections of EN-3. The use of such terminology is clearly deliberate and refers to something other than EIA, as explained by Spirit Energy. The Applicant’s approach is logically inconsistent and unsustainable.

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<sup>1</sup> ES, Chapter 11, Table 11.4, page 6, row 2; page 12, row 1.

5. Spirit Energy has, therefore, produced in **Appendices 1 and 2** two different mitigation measures in the form of Protective Provisions (1) and (2) in line with EN-3, Offshore Infrastructure Guidance, paragraphs 2.6.181 and 2.6.183-2.6.188, as follows:
- 1) In the absence of a quantitative assessment of risks and the reduction of the same to as low as reasonably practicable, but based on all helicopter operations being able to be accomplished within an obstacle-free cylinder of radius 6nm<sup>2</sup> around an offshore installation<sup>3</sup>, Spirit Energy is confident that Protective Provisions (1) would ensure that, when assessed, the risk resulting from the Applicant's proposed wind turbine array would be as low as reasonably practicable;
 

Or, should the ExA and the Secretary of State conclude in due course that EN-3 paragraph 2.6.183 does not require identified risks to be reduced to as low as reasonably practicable, then:
  - 2) Based upon Spirit Energy's own current assessment (informed by extensive discussions with the Applicant, helicopter operators and subsequent simulator trials) of the commercial and safety impacts of proximity to the Applicant's proposed wind turbine array, Protective Provisions (2) would ensure coexistence and a level of risk, that though not as low as reasonably practicable, would never-the-less be likely to be assessed as tolerable when a full quantitative risk assessment is undertaken.
6. Protective Provision (1) results in columns of obstacle free space at and below sea level of 2nm, and above sea level of at least 6NM radius, from the centre of each current infrastructure element or activity<sup>4</sup>. The radius is the minimum required for a helicopter ARA approach. It is a matter for the Secretary of State to address the Applicant's failure to discharge the expectation upon it cast by paragraphs 2.6.157 and (in particular for offshore infrastructure and activities) 2.6.183. The Applicant's plan in ES, Annex 8.1, Figure 7.10 illustrates the successful co-existence at (about 6nm and excluding C6 and C7) of the current Spirit Energy infrastructure and activities with the proposed outline area of the array using the Applicant's radii of 7nm.
7. Protective Provision (2) results in columns of obstacle free space at and below sea level of 2nm, and above sea level of at least 3.3NM, from the centre of each current infrastructure element or activity. The radius is the minimum that Spirit Energy itself considers, on the basis of current information, can be tolerable to it. That is, and for the purposes of EN-3, paragraphs: 2.6.184, after such a mitigation measure, the risk to safety is not unacceptable; and 2.6.186, after such a measure is in place, the measure is "sufficient" to reduce the risks to safety engendered by siting large turbines in very close proximity to existing offshore infrastructure (NUIs) and activities (exploration and exploitation) to a degree that the ExA can properly recommend and the Secretary of State can properly conclude that the risk level is sufficiently safe to not to refuse *outline* consent for up to 300 large turbines. A plan by Spirit Energy entitled "Spirit Energy Protective Provision Areas" shows the successful co-existence of the current Spirit Energy infrastructure and activities with the proposed outline area of the array.
8. Protective Provisions (1) and (2) derive from, and follow, the submission of its original Relevant Representations (Objections) of 20 July 2018, and the continued participation by Spirit Energy in the Examination Hearing process, giving written and oral expert marine and aviation evidence to the

<sup>2</sup> Note that Spirit Energy has arrived at 6nm after discussions with the Applicant and helicopter operators during the course of the examination. This is a reduction from Spirit Energy's initial position that 7.5nm were required.

<sup>3</sup> In line with CAP 764, paragraphs 1.2(1) and 3.31-3.32.

<sup>4</sup> See EN-3, paragraph 2.6.183 where potential affects concerns both infrastructure and activities, and the Marine Policy Statement (March 2011), paragraphs 3.3.7-3.3.10, in particular 3.3.10 where: (Emphasis added)

"... in all areas it is likely that there are new discoveries still to be made and these resources need to be accessed to achieve the objective of maximum economic recovery. Initial exploration for oil and gas is generally undertaken by seismic survey vessels. Continued access to areas of interest for exploration surveys is necessary but this exploration need not be a permanent barrier to other uses of the sea. Where economically recoverable quantities of hydrocarbons are found, the exclusion footprint of any drilling or offshore production facilities required can be relatively small and may have only a limited impact on other resources and uses of the sea."

Examining Authority (ExA) on 4 December 2018 and 7 March 2019, and by further written submission responding to questions of the ExA and the Applicant's position, following the failure of the Applicant to execute reduction of evident risks to Spirit Energy's infrastructure and activities.

9. In requesting that an appropriate set of protective provisions is incorporated within the DCO to ensure (i) the relevant "potential affects" and their consequences ("risks") in so far as relating to Spirit Energy are reduced to "as low as reasonably practicable", and/or (ii) that such risks are sufficiently reduced such that the "successful coexistence" of its existing infrastructure and activities with (in due course) the sited turbines within the currently proposed array of the proposed outline wind farm, Spirit Energy relies on that written and oral evidence in full. The following elements are, however, highlighted for ease of reference –
- Original objections dated 20 July 2018 – PINS ref. RR-107, RR-108 and RR-109
  - Elaborated on in written submissions of 7 November and 14 December 2018 – PINS ref. REP1-041 and REP3-030.
  - Relevant legal and policy case set out in written submissions of 14 December 2018 – PINS ref. REP3-030 and REP3-062
  - The technical case in support of Spirit Energy's on aviation and marine matters respectively is set out in –
    - AviateQ's report, addendum and slides – PINS ref. REP3-055, REP3-06 and REP7—09
    - DNV GL report, addendum and technical notes – PINS ref. REP3-053, REP3-060 and REP7-094
  - Spirit Energy's latest position on the required protective provisions is set out in Appendix 1 and 2 of this submission comprising –
    - Revised protective provisions sought by Spirit Energy originally submitted on 1 April 2019 and
    - Revisals to/comments upon protective provisions proposed by the Applicant.

### **Objection**

10. Spirit Energy's concerns have been set out in full within its written and oral case as referred to above, but for the benefit of the ExA the position at the date of this submission remains as set out below and in the Need for Protective Provisions part of this submission.
11. These are –

### **Restrictions on Safe Aviation Resulting in Restricted Safe Infrastructure Exploitation and Exploration Activities –**

- The safe operation of Spirit Energy's gas extraction operations and exploration activities pursuant to the Secretary of State for Business, Energy and Industrial Strategy's MER Strategy and Core Obligation is currently unaffected by physical impediments in close proximity to them;
- Safe operation includes reliance on helicopter access and egress for assets being maintained and following exploration, drilling vessels<sup>5</sup>;

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<sup>5</sup> Drilling vessels have integral helidecks that enable access and egress to and from them.

- Helicopters can currently access and egress the Spirit Energy assets in all weather conditions in which helicopters are permitted to fly;
- In certain weather conditions and in certain wind directions, the currently available opportunities for accessing and taking off by helicopter from Spirit Energy’s existing platforms, including the NUIs at Chiswick and Grove, and rigs and/or vessels which will from time to time be located at the proposed sub-sea wells will become permanently physically restricted if the (Rochdale Envelope) DCO were to be confirmed without SE’s Protective Provisions;
- The nature and effect of the (proposed) restrictions resulting from the proposed physical presence of large turbines and the circumstances in which the restrictions arise was addressed by Mr Reynolds (AviateQ) at the ISH8 hearing and is set out within the slides prepared by Mr Reynolds submitted with this representation;
- Spirit Energy does not fly to and from its platforms unless it is safe to do so. The safety implications of the proposed physical restrictions upon access and their consequences for safe operation of Spirit Energy’s assets are summarised in Appendix 5 of Spirit Energy’s Deadline 7 submission.
- The commercial implications of the physical restrictions were previously summarised in Appendix 3 of Spirit Energy’s Deadline 9 submission. The table below (Table 1) those impacts as revised in light of the simulator trials of 31 March 2019.

Distance to windfarm (nm)	No windfarm	With Windfarm	% of available flights lost	Lost flights due to H3 (days)	Average time (days) until flights can be resumed	Lost Revenue based on lost time to restore (£million)
3.5	97%	92%	5%	16	1	0.6
3.4	97%	92%	5%	16	1	0.6
3.3	97%	92%	5%	16	1	0.6
3.2	97%	87%	10%	35	1	2.0
3.1	97%	84%	13%	43	2	2.9
3	97%	84%	13%	43	2	2.9
2.9	97%	81%	16%	53	2	4.0
2.8	97%	81%	16%	53	2	4.0
2.7	97%	64%	34%	115	2	9.0
2.6	97%	52%	46%	155	2	13.3
2.5	97%	49%	49%	165	2	14.8

Table 1

### **Restrictions on Sea Space Resulting in Displaced Vessels in Close Proximity to Infrastructure and Activities -**

- There are currently no fixed or permanent physical impediments to navigation in *close* proximity to Spirit Energy assets in relation to which a risk of allision could arise (see, for example, ES, Chapter 11, Figures 11.3; 11.4; 11.6; 11.7; and 11.8);
- With the proposed (Rochdale Envelope) DCO permitting siting of large turbines anywhere within the proposed array area, it must be presently assumed that large turbines could be situated in close proximity to Spirit assets with the result that sea room will be reduced between Spirit Energy assets and proposed physical turbines. Mr Sinclair gave expert marine evidence about this and the matters below in his expert reports and oral evidence;
- With the array in place, in certain weather conditions (particularly westerly and northerly gales) small and medium size commercial vessels may choose to transit, respectively –
  - To the east of the array in close proximity to Spirit Energy's infrastructure
  - To the south of the array and around or through the south east corner of the array in close proximity to the Grove NUI
- Vessels transiting in closer proximity to the Chiswick and Grove NUIs in consequence of the proposed wind farm increases the risk of allision with the platforms;
- Separately, (i) third party vessels transiting through the array and exiting in close proximity to the Chiswick and Grove NUIs and (ii) the Applicant's construction and supply vessels (in the event of going not under command) risk allision with the platforms;
- While these risks should ordinarily be mitigated by the predictive REWS operating from the J6A platform, as is acknowledged by the Applicant, the windfarm once installed may adversely impact on the operation of the REWS thereby prejudicing its ability to give sufficient warning (20 minutes) of potential allision risk;
- Lastly, the presence of the proposed wind farm will restrict the sea room currently available to Spirit Energy's works vessels with consequent delays to required activities;
- The safety implications of this are summarised in Appendix 5 of Spirit Energy's Deadline 7 submission; and
- The commercial implications of this are summarised in Appendix 3 of Spirit Energy's Deadline 9 submission.



## ALARP Assessment

12. “ALARP” is ordinarily a concept applied in the UK jurisdiction in the field of health and safety. ALARP does not represent zero risk but requires risk to be made tolerable. Generally, ALARP is an obligation placed on the occupier or the controller of the workplace. In the offshore sector, the Offshore Installations (Offshore Safety Directive) (Safety Case etc.) Regulations 2015 (SCR 2015) applies to regulate risks in relation to oil and gas operations in external waters. HSE’s Energy Division (ED) is responsible for the offshore oil and gas industry. HSE and DECC (now BEIS), working in partnership, have formed the Offshore Safety Directive Regulator (OSDR), to act as the Competent Authority responsible for implementing the requirements of the EU Directive on the safety of offshore oil and gas operations. However, these provisions do not extend to regulate the prospective inter-relationship between existing oil and gas infrastructure and proposed renewable infrastructure whose future presence may foreseeably change the pre-existing risk profile. Were the DCO to be authorised without the Protective Provisions, then the evidence before the ExA shows that the risk profile would change and, if the turbines were erected close to Spirit Energy’s assets and activities, Spirit Energy would be required to consider whether, after the event of DCO authorisation, the changed risk profile was tolerable by execution of a Safety Case review.
13. But, being live to the challenges posed by existing and developing industries in an offshore context, Parliament introduced the concept of “as low as reasonably practicable” (“ALARP”) as a concept into the field of the Planning Act 2008 authorisation process for DCOs through the vehicle of the statutory guidance of the NPS (here, EN-3, for renewables). It is not open to any party to dispute the merits of Parliament’s statutory guidance and whether Parliament was right to impose ALARP in relation to NRAs or Offshore Infrastructure.
14. In its introduction of the “ALARP” concept, Parliament has been cognisant of the use of the EIA assessment process to assess effects of proposed DCO infrastructure and has chosen to not use the same principles or thresholds in its guidance requirements for the meaning and application of the ALARP concept. Thus, EN-3 expressly provides that the requirement to conduct an ALARP assessment is not contingent upon a baseline threshold of “impact”. See EN-1, paragraph 4.2.11 where “effects” are to be read as “likely significant” but “affects” are not so read. Thus, the threshold for triggering ALARP risk reduction is not the same as EIA and can be a lot lower.
15. Parliament has used “ALARP” in three places in EN-3:
  - In relation to Navigation Risk Assessment (NRA), an NRA is required, under paragraph 2.6.156, to be undertaken in accordance with relevant Government guidance, and, thereby, ALARP is incorporated through MGN 543 (M+F) because MGN 543 page 1 requires MGN 543 to be read in conjunction with the “Methodology for Assessing the Marine Navigational Safety Risks & Emergency Response of Offshore Renewable Energy Installations” (2013). That Methodology (2013) introduces ALARP at C4, page 58<sup>6</sup> and page 59. It also introduces the “Marine Navigational Safety Goal” at page 20<sup>7</sup> that accommodates a process of “Through life review” (see paragraphs 4.3 and 5.1).

<sup>6</sup> “Determining whether the predicted level of risk from an OREI development is tolerable or not is in the first instance a matter of asking the following questions:

i) is the risk below any unacceptable limit that has been established?

ii) if so, has it also been reduced to as low as reasonably practicable (ALARP)?

The risk is only tolerable if the answer to both these questions can be demonstrated to be ‘Yes’.”

<sup>7</sup> Paragraph 42 states (Emphasis added): Due to the lack of specified goals it is therefore prudent to consider the overarching UK principle of reducing risk to that which is “as low as reasonably practical” and that “relevant good practice risk controls are in place”.

This overarching principle is based on the UK Health and Safety Executive (HSE) document “Reducing Risks Protecting People”, which is a guide to the HSE’s decision-making process<sup>7</sup>. The document is aimed at explaining the decision making process of the HSE<sup>8</sup> and therefore contains much useful information on risk-based decision making.

16. Spirit Energy understands paragraph 4.3 to mean that EN-3 NRA envisages that ALARP applies and that (with appropriate clearly defined legal parameters in this outline DCO Application<sup>8</sup>) a staged approach to ALARP can occur in an NRA. Spirit Energy's marine Protective Provisions (1)9 and (2)9 accommodate a staged approach through admitting a construction management protocol within a minimum protective diameter. This enables turbine siting in conjunction with detailed management. Spirit Energy's approach and its Protective Provision (1)9 and (2)9 clear legal parameters provide a framework within which subsequent decisions can be worked out in detail and appears consistent with the staged approach envisaged by the Applicant at ES, Annex 7.1, paragraph 3.2.1.5: "Further risk control measures may be required to further mitigate the impact [affect] in accordance with ALARP principles. Unacceptable risks are considered not to be ALARP". Spirit Energy has made previous expert marine submissions about the current gaps in the Applicant's assessment but these can be accommodated within Spirit's Protective Provisions (1)9 and (2)9).

- In relation to Navigation (see paragraph 2.6.163) where it says this:

*In such circumstances the IPC should expect the applicant to minimise negative impacts to as low as reasonably practicable (ALARP).*

- And in relation to offshore infrastructure (see paragraph 2.6.183) where it says this:

*In such circumstances the IPC should expect the applicant to minimise negative impacts and reduce risks to as low as reasonably practicable.*

17. It is evident from paragraphs 2.6.163 and 2.6.183 that Parliament identifies the "applicant" as the relevant individual to bear the obligation to reduce "risk", and "expects" such an applicant, here, the Applicant, to discharge the obligation by its reduction of the risks to as low as reasonably practicable. This approach is consistent with the law in relation to ALARP. See Spirit Energy's previous submissions. If it were otherwise, then (as with the application of the ALARP concept elsewhere), the relevant individual could avoid its responsibilities and the burden placed on it.

18. Under the express "ALARP" guidance in paragraph 2.6.163 (navigation), the Applicant has raised no dispute about the "expectation" cast upon it or application of that "ALARP" concept in that situation as Parliament there applies it. See ES, Annex 7.1, paragraph 2.1.1.1, bullet 1, and paragraph 3.2.1.5 ("unacceptable risks are considered not to be ALARP"). It has begun an NRA under EN – 3 paragraph 2.6.156 and applied MGN 543 (but not the Methodology (2013) required by MGN 543 to also be considered). But, the Applicant does dispute that it is under any "expectation" or any "ALARP" expectation under the same wording ("as low as reasonably practicable") in paragraph 2.6.183. The Applicant's dispute about not addressing the "expectation" upon it in 2.6.183 but not in 2.6.163 is logically inconsistent.

19. Further, the Applicant has persistently (from ISH1 and to date) disputed that there is any *need* at all to undertake an ALARP assessment for two reasons:

- 1) that the concept of reducing risks to "*as low as reasonably practicable*" does not *apply* in the Planning Act 2008 sphere (the Applicant's oral submissions to ISH1);
- 2) there is no need for the Applicant to execute a process to reduce risks to "*as low as reasonably practicable*" in relation to Spirit's assets.

In relation to (1), it can be reasonably concluded from the Applicant's contention that its Application (and EIA) is devoid of an EN-1 and EN-3 compliant ALARP assessment per se as the Applicant would not otherwise seek to avoid the expectation upon it of that requirement. Therefore, it can also be reasonably understood that the Applicant has no evidence to itself discharge that expected requirement.

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<sup>8</sup> See Advice Note 9: Rochdale Envelope; and the *Smith* [2003] 2 P+CR 11 (CA) case previously provided, paragraph 33.

In relation to (2), the Applicant also disputes the “need” for such an assessment per se. Again, it can be reasonably understood from that contention that it has no evidence of a compliant assessment itself. Ultimately, the Applicant’s suggestion, that paragraph 2.6.183 is a matter of “interpretation”, is a thinly veiled attempt to avoid Parliament’s clear express wording of the expectation cast by it upon the Applicant but which the Applicant remains not entitled to dispute because that would be to dispute the merits of the NPS. Despite its suggestion, the Applicant has advanced to date no reasoned argument to show why its suggestion can or must be correct. Nor can it. At ISH8 it fell back on trying to apply a “planning balance” into EN-3, paragraphs 2.6.179-188 to avoid addressing its own obligation.

20. In substance, the Applicant’s arguments distil to a contention to the ExA and to the Secretary of State that it is not required by EN-3 paragraphs 2.6.179-188 to descend to a level of detail below that of the EIA process nor to consider potential affects comprising “risks”. The Applicant’s argument is consistent with it disputing the relationship of EN-1 paragraph 4.2.11 and EN-3. However, once again, the Applicant’s real contention is that it is not required by EN-3 to consider “risks” or “affects” that are below the level of “likely significant” effects. Spirit Energy has made submissions in relation to the misplaced nature of the Applicant’s contentions and that the Applicant’s seeking to dispute the merits of EN-3, paragraphs 2.6.183 to 2.6.188. The result is that the Applicant itself now presents no evidence about the “risks” (viewed through a paragraph 2.6.183 risk-based assessment as opposed to an EIA-based assessment) of concern to Spirit Energy other than viewed through the very different lens of EIA that excludes any factor that does not qualify by assessment as a likely significant effect. So viewed, the Applicant continues to exclude from consideration (and excludes from consideration by the ExA and the Secretary of State) the risks required to be addressed by paragraphs 2.6.183-188 in the circumstances of this Application.
21. However, Parliament’s statutory guidance EN-3, in paragraphs 2.6.183-188 is addressed to situations of offshore “infrastructure or activity” concerning the interposition of new renewables infrastructure into existing situations where petroleum assets are being exploited (“infrastructure”) and explored (“activity”). Therefore, the concept of “risks” and their reduction to “as low as reasonably practicable” falls to be considered in that context.
22. The particular “risks” here concern risks to ongoing safe gas exploitation and exploration engendered by changes to the subsisting marine risk and reduced availability of opportunities to access / egress Spirit Energy’s assets by helicopter arising from the proposed physical array.
23. It is common ground that:
  - 1) allision of vessels of a minimum size with Spirit Energy infrastructure will likely result in a catastrophic consequence to life by explosion and to offshore infrastructure (ES, Chapter 12, paragraph 12.7.2.22, bullet 1);
  - 2) the physical presence of large turbines actually impede access and egress by helicopters to:
    - a) gas infrastructure exploiting resource (ES, Chapter 12, paragraph 12.7.2.35, bullet 3);
    - b) identified Contingent Resources at C6 and C7 that currently is being actively explored and in due course will be drilled and then got (ES, Chapter 12, paragraph 12.7.2.35, bullets 4-5 and 8).
24. The Applicant presents no evidence that its proposed windfarm would not “potentially affect” this infrastructure and activity, and it cannot exclude such potential affects because the Applicant has applied for a Rochdale Envelope DCO and awaits a Financial Board decision later in Autumn 2019. Therefore, it cannot today know where large turbines may be sited. Rather, in adopting a Rochdale Envelope approach, the ExA and Secretary of State are required to adopt a “reasonable worst case” approach. Adopting that approach, it is reasonable to consider that the Applicant would (without additional parameters, controls, or measures) seek to site turbines as far east as the array edge and also without avoiding the C6 and C7 locations. Indeed, there is no current parameter in its Application or in its DCO that recognises a spatial constraint at sub-sea level, sea level or above sea level.

25. As is set out in detail within previous submissions, there is a clear expectation within national policy EN3 that an applicant seeking a development consent order for an offshore wind farm such as the Applicant, will reduce risks in relation to navigation and shipping, and to offshore infrastructure and activities to as low as reasonably practicable (ALARP). Those risks include the risks to Spirit Energy's existing and future infrastructure and activities described above. Risk reduction should be achieved by the Applicant through site selection and design but the Rochdale Envelope approach reserves these matters to a future date and so these cannot be relied on today.
26. In order to fulfil this expectation, the Applicant must carry out an appropriate ALARP assessment(s). The Applicant has not done so – its assessment work being limited to the Environmental Impact Assessment, including (for marine risks) the Navigational Risk Assessment. DNV GL's Technical Note (Gap Analysis of MGN543 (M&F) Requirements and the Applicant Energy Hornsea 3 Navigational Risk Assessment), Appendix 3 of Spirit Energy's Deadline 7 Submission addresses the evidential gaps and deficiencies in the latter.
27. The Applicant acknowledges that an ALARP assessment has not been carried out by it in relation to Offshore Infrastructure and Activities, but disputes any requirement to do so. That it disputes that it must assess risks reveals the heart of the difference between the Applicant and Spirit Energy summarised in the introduction to this position statement: the Applicant has adopted an EIA-based approach and Spirit Energy has adopted a risk-based approach. Spirit Energy submits that its own approach properly reflects the requirements and approach of the express terms of EN-3, paragraphs 2.6.156 (MGN 543 and the Methodology (2013) application of ALARP and the Marine Goal) and also 2.6.183 (reduction of risks to as low as reasonably practicable). The correct approach and, (if Spirit are correct) the consequences for an applicant using the Rochdale Envelope approach in failing to adopt a risk-based approach) are matters for the Secretary of State to determine.
28. In these circumstances, if otherwise minded to grant the DCO sought, the Secretary of State must incorporate appropriate protective provisions in order to reduce the risks to ALARP and provide clear parameters for their future outworking<sup>9</sup>. Spirit Energy's position on protective provisions is set out below.
29. If, however, the ExA and the Secretary of State disagree that identified risks must be reduced to as low as reasonably practicable pursuant to EN-3, paragraphs 2.6.156 and 2.6.183, then protective provisions (2) for the benefit of Spirit Energy remain necessary, justified, and reasonable on policy grounds, namely –
- Securing successful co-existence in terms of EN3, paragraph 2.6.181; and
  - Maximising economic recovery of oil and gas in line with the MER Strategy authored by the same Secretary of State who is also determining this DCO Application but pursuant to his Petroleum Act 1985 statutory obligation<sup>10</sup>.

### **Discussions**

30. Spirit Energy raised its concerns in September 2016 and 2017 (see ES, Chapter 11, pages 6, row 2 "impracticalities regarding helicopter access/egress to/from the Chiswick platform and any future exploration vessels", and page 12, row 1 "risk assessment methodology: ... intolerable from a safety perspective ... incorrectly evaluated..."). It and the Applicant have engaged in discussions in an attempt to narrow the issues between them. Appendix 4 of Spirit Energy Deadline 9 Submission sets out the parties' joint position on progress made in this respect, while Appendix 3 of the same submission sets out Spirit Energy's understanding of the key matters remaining in dispute.
31. It has not therefore been possible to agree a set of jointly proposed protective provisions as set out below.

<sup>9</sup> See Advice Note 9; and *Smith (CA)*, paragraph 33.

<sup>10</sup> See Spirit Energy's original Written Representations where this is set out.

### **Simulator Trial**

32. Spirit Energy has commissioned simulator trials to assess the impact on helicopter flights. It has undertaken flight simulations reported in its first AviateQ Report that identified the relevant risks. It has recently undertaken further flight simulations to ascertain whether or not the particular theoretical manoeuvres advanced by the Applicant can be undertaken practically, and, if so, the extent of obstacle free airspace likely to be required to render impacts tolerable (envisaged by CAP 764, paragraph 3.31(2)<sup>11</sup>).
33. The Applicant and Spirit Energy agree that, based on their calculations, a distance of 2.8nm may be sufficient to carry out the majority of helicopter operations such that the impact on Spirit Energy's operations is manageable. The calculated (but untested/theoretical) distance remains untested by the parties jointly at this time.
34. In the interests of practicably ascertaining appropriate distances required rather than relying on that theoretical minimum, Spirit Energy arranged for an appropriate simulator trial to take place on 31 March 2019. Pilots were provided by Spirit Energy and the Applicant's current helicopter provider, CHC, and included an independent training pilot from a pilot school. The simulator trials were designed by the helicopter operator and observed by a former national aviation regulator. The simulator provider also monitored the trials.
35. The Applicant was given the opportunity to attend and assist with planning and evaluation, but was unavailable to participate.
36. A more detailed description of the scope and design of the trial and process adopted is set out in Appendix 4 of this submission.
37. The trial entailed 12 flights each testing a different manoeuvre or that manoeuvre under different environmental conditions. The main results of the trial were that:
- A take-off (even with an engine failure) can be executed within 2.8nm as calculated by the Applicant and Spirit Energy
  - A descent (not into wind) followed by circling the platform to make the final approach into wind proved to be very challenging and it was assessed that contrary to earlier calculations performed by the Applicant and Spirit Energy, this manoeuvre cannot safely be undertaken within 2.8nm rather a distance of 3.3nm from the nearest WTG would be required. This manoeuvre would be relied upon when the wind is from the east as the alternative, a straight line instrumented descent (ARA), would require 6nm unobstructed airspace downwind of the destination installation.
  - Notwithstanding the above, the pilots (who were an experienced test pilot and an experienced training pilot) commented that flying these manoeuvres close to the windfarm was very challenging and felt very uncomfortable.
38. The findings of the trial support a separation (radius) between Spirit Energy's platforms and sub-sea wells (existing and proposed) of 3.3nm for the reasons set out in Appendix 4.
39. While it is recognised that further jointly planned simulator trials at a later date may be beneficial to corroborate the outcome of this exercise, these findings from the 31 March trial may be viewed as

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<sup>11</sup> CAP 764, paragraph 3.31(2) includes: “

As helicopters approaching offshore installations must make the final approach substantially into wind, the approach could be from any direction. The obstacle-free zone must, therefore, extend throughout 360° around the installation to prevent restrictions being placed on the direction of low visibility approaches and departures“.

(3) includes: “

For obvious safety reasons, a go-around involving a climb from the minimum descent height needs to be conducted in an area free of obstructions as this procedure assures safe avoidance of the destination structure“.

(4) includes: “

The distance to climb to a safe altitude by which either a turn can be carried out, or straight ahead, to reach separation from obstacles will be dependent on aircraft one engine inoperative performance criteria”.

the best evidence before the Examination of actual pilot requirements in a “real life” scenario with the wind farm constructed.

40. If the parties are able jointly to organise further simulator trials following the conclusion of the hearing phase of the Examination, such that additional evidence of the position becomes available then Spirit Energy will work with the Applicant to make that available to the Examining Authority in the hope that it can be taken into account by the Secretary of State in due course.

### **Protective Provisions (1) and (2)**

#### **The Need for Protective Provisions (1) and (2) by Spirit Energy**

##### “Potential Affects”

41. EN-3 provides specifically for establishing the inter-relationship of existing infrastructure and activities in paragraphs 2.6.182 to 188. Paragraph 2.6.182 recognises that there are certain relevant statutory provisions, whereas the policy objective of securing successful co-existence in the physical relationship between offshore infrastructure and activities and proposed turbines is set out in paragraphs 2.6.183 to 188, taken together and with the paragraph 2.6.181.
42. (Not accepting that the EIA *approach* complies with, or can be a proxy for the EN-3, paragraph 2.6.183 expectation upon the Applicant and the 2.6.157 NRA requirement (including ALARP)), the Applicant’s ES includes evidence that accepts, for example, that “due to the installation of wind turbines within the Hornsea Three array area, ... a volume of airspace would be considered unavailable for instrument approaches” (ES, Annex 8.1, paragraph 7.4.5.2).
43. The Applicant also accepts that (for example) “for obvious safety reasons” helicopter procedures (in particular, a MAP) “involving a climb from the minimum descent height needs to be conducted in an area free of obstructions” (ES, Annex 8.1, paragraph 7.4.3.1). It also accepts (for example) that the presence of turbines “*may* impair safety of air operations to [the given] installation and *affect* the installation operators’ regulatory requirements with regard to *safety* of operation” (see ES, Annex 8.1, paragraph 7.4.1.4).
44. The Applicant further accepts that “during the approach to an installation ... maintaining required distances from any obstacles ... may impair the safety of instrument approaches and MAP to and from an offshore installation. This may result in a restriction on helicopter operations to an installation in certain weather conditions, which may have safety implications. Safety implications include a potential impact upon the integrity of offshore platform Safety Cases that are based on the use of helicopters to facilitate evacuation procedures” (ES, Chapter 8, paragraph 8.7.4.13). Such restrictions are wide ranging and include restrictions on decommissioning “activities” (ES, Chapter 8, paragraph 8.7.4.14), and restrictions may affect “the presence of a rig or vessel that is equipped with a helideck” (ES, Chapter 8, paragraph 8.7.4.15).
45. Spirit Energy has provided evidence that its Safety Case does indeed rely on helicopters to facilitate evacuation and that in the absence of appropriate protective provisions, the wind farm is likely to lead to the premature cessation of operations to exploit gas and impede exploration and decommissioning activities. Therefore, and by way of such examples, it is common ground that the proposed array *area* will likely result (when finally populated by turbines following discharge of detailed design requirements) in “potential affects” on both offshore infrastructure and activities, including those of Spirit Energy, that qualify on Spirit’s evidence as “risks” to safe exploitation and exploration activities, and satisfy the trigger requirement of EN-3, paragraph 2.6.183.
46. Therefore, there can be no dispute that, in fact, the “expectation” of paragraph 2.6.183 is engendered and required to be discharged by the Applicant. But the Applicant has not executed or discharged an expectation upon it *other than* an EIA process and that process has stopped short of the discrete further requirement of 2.6.183 to reduce risks to as low as reasonably practicable.

Instead, the Applicant has purported to address the risk by excluding it from further consideration because it is a less than likely significant effect". However, the practical outcome of the Applicant's approach and case is to rewrite 2.6.183 to delete the last part of that paragraph. But, the Applicant is not entitled to dispute the merits of Parliament's NPS. Consequently, there remains a gap in the Applicant's application evidence that it cannot now fulfil.

47. There are also potential affects arising from the proposed presence of turbines within the array area from the allision of displaced vessels with Spirit infrastructure due to reduced sea room. The Applicant has undertaken an NRA purportedly in line with EN-3 paragraph 2.6.156. But, again, this NRA is incomplete as it fails to address the requirements of Government guidance in "Methodology for Assessing the Marine Navigational Safety & Emergency Response Risks of Offshore Renewable Energy Installations" (2013) required by MGN 543.
48. Spirit Energy has led expert evidence showing that the Applicant's Figure 18.6 simulation in ES, Annex 7.1, is not credible as its arbitrary input of a notionally solid array area has excluded evidence of vessels transiting the array area (in breach of MGN 543 and MGN 372) and so not taken account of these nor vessels travelling along the array eastern boundary in a reduced sea area. Spirit Energy has also provided evidence that a vessel having more than a 50 mega joule impact upon its infrastructure would likely result in catastrophic consequences for those on the vessel and infrastructure as well as the infrastructure.
49. The Applicant accepts at ES, Chapter 12, paragraphs 12.7.2.22, bullet 2 "potential impacts" of "increase in vessel to structures allision risk (including emergency situations) ... externally ... the array", 12.7.2.23 and Table 12.11 that recognises as "minor adverse" the "external risk" of increased allision risk. But, the Applicant has not begun to apply EN-3, paragraph 2.6.156 (ALARP) to allision risk nor paragraph 2.6.183 in relation to the reduction of allision risks with offshore infrastructure to as low as reasonably practicable. Spirit Energy's evidence identifies where the gaps in the current approach of the Applicant lie. The consequence of this is that there is evidence of a "potential affect" of vessel allision and that this is a "risk". Consequently, there remains a gap in the Applicant's application evidence also on vessel allision with offshore infrastructure that it cannot now fulfil.
50. There are also potential affects arising from the proposed presence of turbines within the array area in close proximity to the areas in which Spirit Energy is currently exploring and exploiting from subsea locations as part of the discharge of the requirement on it to explore, bore, and get, and in line with the Secretary of State's MER Strategy. The Applicant accepts at ES, Chapter 12, paragraphs 12.7.2.35, bullets 4, 5 and 8, and Table 12.15 (see rows 4, 5, and 8), that exploration space would be restricted also by the presence of turbine structures to an EIA degree including "minor adverse".
51. The presence of turbines in the location of the areas shown in C6 and C7 as "Contingent Reserves" will likely impede the exploitation of gas from those locations and raise risk levels for personnel working there due to constraints on helicopter access/egress. Spirit Energy's evidence in its Written Representations identified their locations and status, and this has been recently amplified with further evidence. (See Deadline 9 Submission, Appendices 1 and 2)However, whilst the Applicant properly recognises that restrictions on exploration and future gas drilling, and vessel access to gas platforms and subsea infrastructure are relevant and important activities to assess for EN-3 EIA purposes, its *EIA* assessment has categorised them as "minor adverse" (even on an EIA scale).
52. Then, again, the Applicant has stopped short of undertaking an EN-3, paragraph 2.6.183 assessment to reduce the identified risk of safe exploration (and, in turn, safe exploitation by jacked up vessel) in the subsisting Spirit Energy licenced areas, in particular of C6 and C7. Consequently, there remains a further gap in the Applicant's application evidence in relation to: vessel allision with offshore infrastructure; physical restrictions on space for future gas drilling and placement of infrastructure; and, the disruption on vessel access to gas platforms and subsea infrastructure, in the locations of C6 and C7 that it cannot now fulfil. That is, it has no evidence (other than in and for EIA purposes) before the ExA and the Secretary of State. Without reversing onto Spirit Energy the

burden of proof established by Parliament in 2.6.183 upon the Applicant, the Applicant remains currently in breach of 2.6.183 expectation upon it. The consequences of that breach for the Applicant are a matter for the Secretary of State.

53. These are not gaps in its Application that can have taken the Applicant by surprise because Spirit Energy alerted the Applicant to flaws in the Applicant's methodology in September 2017. See ES, Chapter 11, page 12, row 1: the "risk assessment methodology: discussion is needed on the approach and conclusions" and that Spirit Energy's predecessor "has concerns that what is considered intolerable from a safety perspective are incorrectly evaluated". Regrettably, that remains the case as at 1<sup>st</sup> April 2019. Further, the same predecessor raised the concerns about proximity and also about maximising economic recovery as "discussion is needed on impacts of the proposed development on ... gas companies' legal obligation to take the steps necessary to secure the maximum value of economically recoverable petroleum from the strata beneath UK waters". See ES, Chapter 11, page 12, row 1, column 3. The Applicant's approach does not reflect the requirement upon it in EN-3, paragraph 2.6.181 to itself ensure "successful co-existence" between subsisting gas petroleum activity and exploitation and the Applicant's proposed array.

54. The Applicant purported to respond to the concerns in column 4 on page 12 of that ES Chapter 11. But it is now clear that it has failed to descend to the level of detailed analysis that Parliament has required in EN-3, paragraph 2.6.156 (ALARP) and paragraph 2.6.183 (as low as reasonably possible) in relation to the potential for successful co-existence between subsisting exploitation and exploration of subsisting licensed areas for gas extraction and the proposed establishment of a turbine array. The Applicant contends that it has no obligation under EN-3, paragraph 2.6.183 to reduce identified risks to infrastructure and activities (separate and discrete from EIA processes) to "as low as reasonably practicable". In so contending, it variously asserts that:

- a) "ALARP" is not a concept used in EN-3. But see EN-3, paragraphs 2.6.156 (and the Methodology incorporated by MGN 543), and 2.6.163;
- b) "ALARP" is not a concept applicable in EN-3 in relation to "offshore infrastructure and activities". But see EN-3, paragraph 2.6.163 abbreviating the phrase "as low as reasonably practicable" to "ALARP" and then reusing the very same phrase "as low as reasonably practicable" in paragraph 2.6.183;
- c) "ALARP" is not applicable in vessel allision risk with offshore infrastructure or reduced sea room. But see EN-3, paragraph 2.6.156 incorporating MGN 543 incorporating the Methodology (2013) that includes Section C4 on ALARP and its assessment on pages 58-59 as well as the Marine Goal at paragraphs 4.2-4.3 and the phrase "as low as reasonably practical" as well as "risk-based decision making". See in respect of paragraph 4.2:

*"Due to the lack of specified goals it is therefore prudent to consider the overarching UK principle of reducing risk to that which is "as low as reasonably practical" and that "relevant good practice risk controls are in place".*

*This overarching principle is based on the UK Health and Safety Executive (HSE) document "Reducing Risks Protecting People", which is a guide to the HSE's decision-making process<sup>7</sup>. The document is aimed at explaining the decision making process of the HSE<sup>8</sup> and therefore contains much useful information on risk-based decision making. (Emphasis added)*

- d) "ALARP" is not applicable by the CAA in its CAP 764. But see footnote 4 to paragraph 1.11:

*"[Obstacle Limitation Surface] is the hypothetical boundary which indicates the extent of a volume of airspace which should be kept free of obstacles, so far as is reasonably practicable, to facilitate the safe passage of aircraft. It is used collectively to refer to other terms which are fully defined in Chapter 4 of Annex 14 to the Chicago Convention and incorporated into UK civil aviation regulation within CAP 168. OLS comprises of: approach surface, balked landing surface, conical surface, inner approach surface, inner horizontal surface, inner transitional surface, take-off climb surface and transitional surface. "*



The phrase “so far as is reasonably practicable” is synonymous with ALARP. See HSE Guidance “ALARP “at a glance”: (Emphasis added)

“ “ALARP” is short for “as low as reasonably practicable”. “SFAIRP” is short for “so far as is reasonably practicable”. The two terms mean essentially the same thing and at their core is the concept of “reasonably practicable”; this involves weighing a risk against the trouble, time and money needed to control it. Thus, ALARP describes the level to which we expect to see workplace risks controlled.”

And

“You may come across it as SFAIRP (“so far as is reasonably practicable”) or ALARP (“as low as reasonably practicable”). SFAIRP is the term most often used in the Health and Safety at Work etc Act and in Regulations. ALARP is the term used by risk specialists, and duty-holders are more likely to know it. We use ALARP in this guidance. In HSE’s view, the two terms are interchangeable except if you are drafting formal legal documents when you must use the correct legal phrase.”

In relation to the application of EN-3, paragraph 2.6.183, the “CAA policy on wind energy [in CAP 764] is that “safety in the air is paramount and will not be compromised” (see paragraph 1.4(1)). That is, the requirement to reduce risk in EN-3 paragraph 2.6.183 to as low as reasonably practicable assumes in relation to safety in the air that such safety is paramount and overrides wind turbine proposals. See also paragraphs 3.30-3.32<sup>12</sup>.

- e) It cannot undertake ALARP because it cannot know the financial situation or commercial situation of Spirit Energy (*inter alia*, its own financial situation). But that contention challenges the merits of EN-3 paragraph 2.6.183 (and ALARP in 2.6.156) because it seeks to reverse the burden that Parliament has placed upon the Applicant as the Applicant: paragraph 2.6.156: “the applicant should undertake...”; paragraph 2.6.183: “The IPC should expect the applicant to ... reduce risks to as low as reasonable practicable” . The terms of EN-3 are consistent with the law in the *Edwards* case in relation to the burden:

‘Reasonably practicable’ is a narrower term than ‘physically possible’ ... a computation must be made by the owner in which the quantum of risk is placed on one scale and the sacrifice involved in the measures necessary for averting the risk (whether in money, time or trouble) is placed in the other, and that, if it be shown that there is a gross disproportion between them – the risk being insignificant in relation to the sacrifice – the defendants discharge the onus on them.”<sup>13</sup>

And in relation to which the HSE has summarised: (Emphasis added)

In essence, making sure a risk has been reduced ALARP is about weighing the risk against the sacrifice needed to further reduce it. The decision is weighted in favour of health and safety because the presumption is that the duty-holder should implement the risk reduction measure. To avoid having to make this sacrifice, the duty-holder must be able to show that it would be grossly disproportionate to the benefits of risk reduction that would be achieved. Thus, the process is not one of balancing the costs and benefits of measures but, rather, of adopting measures except where they are ruled out because they involve grossly disproportionate sacrifices.

<sup>12</sup> CAP 764, paragraph 3.32 provides: “

Owing to the obstruction avoidance criteria, inappropriately located wind turbines could delay the descent of a helicopter on approach such that the required rate of descent (at low level) would be excessive and impair the ability of a pilot to safely descend to 200/300 ft by the appropriate point of the approach (2 NM). If the zone is compromised by an obstruction, it should be appreciated that routine low visibility flight operations to an installation may be impaired with subsequent consequences for the platform operator or drilling unit charterer. One such consequence could be that the integrity of offshore platform or drilling unit safety cases, where emergency procedures are predicated on the use of helicopters to evacuate the installation, is threatened. Additionally, helicopter operations to wind farms may impact on oil and gas operations. It is therefore essential that the installation operators, helicopter operators and other interested parties are engaged in the consultation process”.

<sup>13</sup> See the HSE website at <http://www.hse.gov.uk/risk/theory/alarp.glance.htm> .

Here, the Applicant (not Spirit Energy) is the relevant “duty holder” identified by Parliament in its statutory guidance of EN-3 paragraphs 2.6.156 and 2.6.183: “the applicant should ...”. Spirit Energy is not. It is for the Applicant’s proposal to be made subject to or to implement risk reduction measures rather than for Spirit Energy’s operations to be prejudiced in relation to risk by their absence.

As has been previously submitted, the absence of available financial information to the Applicant by its pending Autumn 2019 Finance Board decision on the DCO project cannot be used in advance by the Applicant as a means to justify itself not being able to comply with its EN-3 obligations in relation to risk-based assessments. Rather, it means that the Applicant has no evidence of finance at this time to place in the scales of risk assessment. But that does not preclude the application of risk reduction measures. If it were otherwise, then an applicant relying on the Rochdale Envelope approach or delayed financial decisions could invariably avoid the requirements of EN-3 paragraph 2.6.156 (ALARP) and paragraph 2.6.183 (as low as reasonably practicable).

55. Adopting the “risk-based” approach of the Methodology (2013) to vessel allision, it is evident from the Applicant’s own evidence of fact in its EIA that there is a recognised “increased” risk of vessel allision with structures or upon exploration activities arising from the proximity of turbines close to such situations (the foreseeable situation being categorised for EIA purposes as “minor adverse”). Adopting the CAA approach of “safety” being paramount, it is also evident from (for example, ES Annex 8.1, paragraph 7.4.4.11, bullets 3 and 6 and Tables 7.6 and 7.9, and paragraphs 7.4.4.14 and 7.4.4.17) that, in fact and in relation to each of Chiswick and Grove NUIs, “the impact of the Hornsea Three array area would be to prevent instrument approaches” for at least some periods.

#### **Resulting Need for the Protective Provisions (1)**

56. Thus, the requirements of EN-3, paragraphs 2.6.156 (ALARP in relation to vessel allision) and 2.6.183, (reduction of the risk to as low as practicable) are expected to be executed and discharged by the Applicant. However, it has not done so.
57. The absence of an assessment by the Applicant itself to have discharged the EN-3 requirements in relation to offshore infrastructure and activities generates a need for the Protective Provisions (1) that concern ALARP and require radii of obstacle free air space of 6NM and sea level areas of 2NM around the Spirit Energy’s NUIs. These Protective Provisions act as a proxy to ensure that the risks required to be reduced to as low as reasonably practicable by the Applicant remain at their current (pre-array) level with the wind farm in place. The 6NM is the minimum distance required to maintain the current level of risk because 6NM is the minimum distance required for helicopter (straight line) ARA approaches.
58. The Secretary of State determining the DCO is that for Business, Energy and Industrial Strategy (“BIES”). He is also the author of the MER Strategy and the Central Obligation, pursuant to section 9A(2) of the Petroleum Act 1998. The Central Obligation requires that Spirit Energy:  
 Relevant persons must, in the exercise of their relevant functions, take the steps necessary to secure that the maximum value of economically recoverable petroleum is recovered from the strata beneath relevant UK waters.

The MER Strategy defines “economically recoverable”.

59. There is, therefore, also a need to ensure that Spirit Energy is able to continue to take steps to safely exploit and explore for petroleum in the discharge of the Secretary of State’s MER Strategy Central Obligation. It is difficult to see how a grant of development consent could override that parallel duty of statutory genesis. Protective Provisions (1) would allow for successful co-existence of existing infrastructure and activities which could otherwise be prejudicially affected by the proposed array and the siting of turbines in close proximity to such infrastructure and activities.

**Spirit Energy's Alternative Protective Provisions (2) in the absence of an ALARP assessment**

60. These Protective Provisions (2) are necessary because, despite continuing discussions with the Applicant referred to below and in the Joint Statement, Spirit Energy's key concerns arising from the proposed wind farm remain unresolved.
61. The EN-3 scheme for establishing successful co-existence between offshore infrastructure and activities and proposed renewables is evidently premised on risk assessment and not on EIA. See EN-3, paragraph 2.6.156 (ALARP derived from the Methodology (2013)) and 2.6.183 (reduction of "risks" to as low as reasonably practicable). In the absence of the Applicant itself having adopted such a risk-based approach (it having adopted an exclusively EIA-based approach evidenced by its production of an EIA), and it having not discharged its obligations under those paragraphs, Spirit Energy has considered the available information to come to a judgement about the likely "stand-off" required to ensure that safety and commercial impacts are likely not to be unacceptable (i.e. that they will remain tolerable). Spirit Energy's conclusions are reflected in the measures comprised in Protective Provisions (2).
62. The Protective Provisions (2) duplicate those in (1) except that they provide for a 3.3NM radii of obstacle free air space around the infrastructure and activity areas of Spirit Energy are not an ALARP result. Rather, that radii extent is judged at this time by Spirit Energy, on the basis of all of the information (including flight simulator evidence) recently now available to it, to be a "sufficient" distance to reduce the risk to safety of operations to a not unacceptable level. These Spirit Energy measures are in line with EN-3 paragraphs 2.6.184 and 2.6.186 and the "risk"-based approach evident from paragraphs 2.6.156 and 2.6.183 required in relation to offshore infrastructure and activities. The CAA authorisation remains required in relation to aviation safety where operational procedures are changed. See CAP 764, paragraphs 2.40 and 1.21-1.22<sup>14</sup>.
63. Should the ExA and the Secretary of State disagree with Spirit Energy's ALARP risk-based assessment case, then Protective Provisions (2) remain necessary, appropriate, and evidentially justified.

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<sup>14</sup> CAP 764, paragraph 1.22 provides: "

"Where a service provider has to make a change to equipment or operational procedures in order to safely accommodate a wind turbine development then the following must be addressed: [see 1-5]".

### **3 NOTE OF APPENDICES**

- 3.1 Appendix 1 – Spirit Energy proposed Protective Provisions (1)
- 3.2 Appendix 2 - Spirit Energy proposed Protective Provisions (2)
- 3.3 Appendix 3 - Spirit Energy's comments on the Applicant's proposed protective provisions – Spirit Energy does not support the Applicant's proposed Protective Provisions but has included these comments upon them as discussed at the hearing on 7 March 2019.
- 3.4 Appendix 4 – Report on findings from aviation simulator trials – 31 March 2019

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**PROTECTIVE PROVISIONS (1) 01.04.19**

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**SCHEDULE 9**

**Part 8**

**For Protection of Spirit Energy North Sea Limited, Spirit Energy Resources Limited and Spirit Energy Nederland B.V. and their Co-Venturers**

**Application**

1. For the protection of the Spirit Energy Group referred to in this part of this Schedule the following provisions must, unless otherwise agreed in writing between the undertaker and the Spirit Energy Group, the affected undertaking concerned, have effect.

**Interpretation**

2. In this Part of this Schedule -

**“Chiswick Restricted Area”** means a volume of obstacle-free space comprising two cylinders each with a horizontal radius of 6<sup>1</sup> nautical miles extending from points at (i) the centre of the helideck of the Chiswick Platform; and (ii) the centre point of the Kew subsea well-head, and extending vertically from mean sea level.

**“Grove Platform Restricted Area”** means a volume of obstacle-free space comprising a cylinder with a horizontal radius of 6<sup>1</sup> nautical miles extending from a point at the centre of the helideck of the Grove Platform, and extending vertically from mean sea level.

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<sup>1</sup> Without prejudice to the requirements of EN-3 and to Spirit Energy’s evidence on the need for the Applicant to carry out pursuant to EN-3 paragraphs 2.6.156 and 2.6.183 an assessment that reduces identified risks to existing offshore infrastructure and activities to as low as reasonably practicable (an ALARP assessment), and this Protective Provision being an acceptable proxy in light of that breach of EN-3 by the Applicant, Spirit Energy has itself undertaken consideration of the risks to the safe operation of its infrastructure and activities and currently considers that alternative protective provisions requiring an obstacle free column of a radius of at least 3.3NM would be sufficient to result in a not unacceptable level of risk (in the language of EN-3, paragraph 2.6.184, and a sufficiently low level of risk (in the language of paragraph 2.6.186) that, after imposition of the Protective Provision, then the ExA and Secretary of State should not refuse to grant consent. Each of the two sets of Protective Provisions accommodates the potential for the Applicant and Spirit Energy to co-operate with clear parameters so as to seek a more refined detailed radii for each of the said infrastructure elements and activities.

**“Grove G5 Restricted Area”** means a volume of obstacle-free space comprising a cylinder with a horizontal radius of 6<sup>1</sup> nautical miles extending from a point at the centre of the Grove G5 subsea well-head, and extending vertically from mean sea level.

**“C6 Restricted Area”** means a volume of obstacle-free space comprising a cylinder with a horizontal radius of 6<sup>1</sup> nautical miles extending from a point at the centre of the Proposed C6 subsea well-head, and extending vertically from mean sea level.

**“C7 Restricted Area”** means a volume of obstacle-free space comprising a cylinder with a horizontal radius of 6<sup>1</sup> nautical miles extending from a point at the centre of the Proposed C7 subsea well-head, and extending vertically from mean sea level.

**“C6 Milestones”** means the following milestones -

(i) A Development Plan for the Proposed C6 subsea well-head shall be produced by Spirit Energy and shared in writing with the Undertaker on or before 31 December 2020.

(ii) Spirit Energy has entered into a contract or other legally binding commitment to lease or otherwise procure a drilling rig and provided written confirmation of this to the Undertaker on or before 31 December 2021.

(iii) Drilling for oil and / or gas at the Proposed C6 subsea well-head has commenced on or before 31 December 2022.

**“C7 Milestones”** means –

(i) A Development Plan for the Proposed C7 subsea well-head shall be produced by SE and shared in writing with the Undertaker on or before 31 December 2023.

(ii) Spirit Energy has entered into a contract or other legally binding commitment to lease or otherwise procure a drilling rig and provided written confirmation of this to the Undertaker on or before 31 December 2024.

(iii) Drilling for oil and / or gas at the Proposed C7 subsea well-head has commenced on or before 31 December 2025.

**“Completion of Decommissioning”** means the date on which the actions required for the decommissioning of the Grove Platform and any related infrastructure in accordance with the Decommissioning Plan are complete.

**“Decommissioning Plan”** means a plan for the decommissioning of the Grove Platform which is approved by the OGA.

**“Development Plan”** means a written exploration and development programme for the Proposed C6 subsea well-head or the Proposed C7 subsea well-head as the context so admits, including details and location of the related infrastructure but only to the extent that the details may impact on the detailed design or development of the authorised works.

**“Proposed C6 subsea well-head”** means the proposed subsea well-head located within the area of sea bed within loxodromes drawn between the following coordinates:

002° 41' 30.7736" E	53° 56' 38.9480" N
002° 42' 25.6172" E	53° 56' 39.0852" N
002° 42' 25.1636" E	53° 57' 43.7954" N
002° 41' 30.2965" E	53° 57' 43.6581" N
002° 41' 30.7736" E	53° 56' 38.9480" N

**“Proposed C7 subsea well-head”** means the proposed subsea well-head located within the area of sea bed within loxodromes drawn between the following coordinates:

002° 40' 47.7256" E	53° 56' 09.6506" N
002° 41' 42.5584" E	53° 56' 09.7933" N
002° 41' 42.4405" E	53° 56' 25.9708" N
002° 40' 47.6018" E	53° 56' 25.8282" N
002° 40' 47.7256" E	53° 56' 09.6506" N

**“Chiswick Field”** means the hydrocarbon accumulation underlying blocks 49/4a, 49/4c and 49/4b of the United Kingdom Continental Shelf.

**“Chiswick Platform”** means the production and processing platform installed in block 49/4a of the United Kingdom Continental Shelf for the exploitation of the Chiswick Field.

**“Co-Venturer”** means any other entity with whom Spirit Energy is or may be from time to time a party to a joint operating agreement or unitisation agreement or similar agreement relating to the operations of the Relevant platforms, the J6A Platform and/or the Relevant Subsea Well Heads, and any future successors and/or assignees of such Co-Venturer.

**“Grove Field”** means the hydrocarbon accumulation underlying blocks 49/10a and 49/9c of the United Kingdom Continental Shelf.

**“Grove Platform”** means the production and processing platform installed in block 49/10a of the United Kingdom Continental Shelf for the exploitation of the Grove Field.

**“Grove G5 subsea well-head”** means the existing subsea well-head located at (lat/long: 53° 43' 04.080", N 02° 49' 48.020" E).

**“J6A Platform”** means the production and processing platform installed in block J6 of the Netherlands Continental Shelf for the exploitation of the Markham Field.

**“Kew subsea well-head”** means the existing subsea well-head located at (lat/long: 53° 57' 20.520" N, 2° 47' 9.395" E).

**“Markham Field”** means the hydrocarbon accumulation underlying blocks 49/5a and 49/10b of the United Kingdom Continental Shelf and blocks J3b and J6 of the Netherlands Continental Shelf.

**“OGA”** means the Oil and Gas Authority, a company incorporated under the Companies Acts (Company Number 09666504), having its registered office at 21 Bloomsbury Street, London, WC1B 3HF, and any successor thereto as oil and gas industry regulator.

**“Relevant platforms”** means, together, each of the Chiswick Platform, the Grove Platform, and the Relevant Subsea Well Heads.

**“Relevant Subsea Well Heads”** means, together, each of Grove G5 subsea well-head, the Kew subsea well-head, and the Proposed C6 subsea well-head and Proposed C7 subsea well-head.

**“Spirit Energy”** means one or each of (as applicable) Spirit Energy North Sea Limited (UK Company Number: 04594558), Spirit Energy Resources Limited (UK Company Number: 02855151) and/or Spirit Energy Nederland B.V. (Company Number: 34081068) who are owners of the Relevant platforms, the J6A Platform and/or the Relevant Subsea Well Heads, and any future successors and/or assignees.

**“Spirit Energy Group”** means Spirit Energy, its Co-Venturers (as applicable), and its and their respective affiliates.

**“Vessel Exclusion Area”** means in so far as relevant, the volumes extending from the sea surface at mean sea level down to the sea bed (i) bounded to the east by a notional loxodrome drawn through and extending beyond the centres of the Chiswick Platform and Grove Platform, to the west by a loxodrome parallel to that loxodrome and at all times 2 nm to the east of it, to the north by the line of latitude passing through the northernmost point on the perimeter of the windfarm array, to the south by the line of latitude passing through the southernmost point on the perimeter of the windfarm array and (ii) bounded by a circle of radius of 2 nautical miles centred on the centre point of each of the Relevant Subsea Well Heads.

**“Hornsea Project 3 Infrastructure”** means any temporary or permanent infrastructure (including but not limited to vessels supporting wind generator turbine infrastructure, buoys, anchor chains, pipes and cables).

**“Buoy”** means any buoy as defined in either Article 2(1) of the Order or in paragraph 1(1) of Part 1 of Schedule 11.

**“Vessel”** means any vessel as defined in Article 2(1) of the Order or in paragraph 1(1) of Part 1 of Schedule 11.

**“Predictive Radar Early Warning System”** means measures including a radar early warning system used to monitor and track the positions of vessels proximate to the Relevant Platforms and the J6A Platform with associated software providing a multi-sensor integrated marine surveillance system with a predictive early warning capability.

**“Works No. 1”** means the area of land within the Order Land specified in paragraph 5 of Part 1 of Schedule 11, the volume of water above it, and the volume of air above that water.

**“Includes”** is to be construed without limitation unless the contrary intention appears.

**“Order Land”** means the Order Land as defined in Article 2(1) of the Order.

**“Undertaker”** means the Undertaker as defined in Article 2(1) of the Order, and any entity within Article 5(1).



## Protective Provisions

### Chiswick Platform

3. No authorised development described in paragraph 1, Work No. 1 (a) and (b) and Work No. 2 (a) and (b) of Part 1 of Schedule 1 may be within the Chiswick Restricted Area.

### Grove Field

4. No authorised development described in paragraph 1, Work No. 1 (a) and (b) and Work No. 2 (a) and (b) of Part 1 of Schedule 1 may be within the Grove G5 Restricted Area until the first of January 2028, or such earlier date as the Spirit Energy Group may advise in writing, at which date the restriction within this paragraph shall have no further effect.
5. No authorised development described in paragraph 1, Work No. 1 (a) and (b) and Work No. 2 (a) and (b) of Part 1 of Schedule 1 may be within the Grove Platform Restricted Area until Completion of Decommissioning or the first of January 2032 whichever is the earlier], at which date the restriction within this paragraph shall have no further effect.

### C6, C7 Sub-sea Well Locations

6. Subject to paragraphs 7 and 8, no authorised development described in paragraph 1, Work No. 1 (a) and (b) and Work No. 2 (a) and (b) of Part 1 of Schedule 1 may be within the C6 Restricted Area or the C7 Restricted Area.
7. The restriction on development within the C6 Restricted Area in terms of paragraph 6 is subject to the timeous occurrence of each of the C6 Milestones, failing which the said restriction shall have no further effect.
8. The restriction on development within the C7 Restricted Area in terms of paragraph 6 is subject to the timeous occurrence of each of the C7 Milestones, failing which the said restriction shall have no further effect.

### Vessel Exclusion Area

9. Unless otherwise agreed in writing by the Spirit Energy Group, no authorised development comprising Hornsea Project 3 Infrastructure under any deemed licence in terms of paragraph 31 of Part 6 of the Order and paragraph 3 of Part 1 of Schedule 11, or otherwise permitted, may be constructed within any Vessel Exclusion Area.

### REWS

10. Unless otherwise agreed in writing by the Spirit Energy Group, no electricity shall be generated by the authorised development unless and until: (i) a validation test in relation to the existing Predictive Radar Early Warning System operating from the J6A Platform has been carried out; (ii) the results of the aforementioned validation test have been shared in writing with the Spirit Energy Group; and (iii) the results of the validation test demonstrate to the Spirit Energy Group's satisfaction in writing acting reasonably

that the Predictive Radar Early Warning System will continue to operate effectively in relation to the Spirit Energy Group's Relevant platforms and the J6A Platform following construction and installation of the authorised development, such that a minimum of 20 minutes warning of potential vessel allision with that infrastructure may be given.

11. Prior to commencing construction of the authorised development described in paragraph 1, Work No. 1 (a) and (b) and Work No. 2 (a) and (b) of Part 1 of Schedule 1, the Undertaker and the Spirit Energy Group shall enter into a good working and communications protocol. The purpose of this protocol is to ensure the safe working of each of the parties' supply and work vessels during the construction, operational and decommissioning phases of the authorised development. The protocol shall be observed and complied with by both the Undertaker and the Spirit Energy Group unless or until any alternative co-operation agreement has been entered into.
12. Unless the Spirit Energy Group has been consulted in writing for 60 days and such representations as it may make to the Undertaker have been included in an application under paragraph 14 of Part 2 of Schedule 11, no application may be made under that paragraph.
13. Subject to a minimum of three arbitrators being appointed with at least one of the arbitrators appointed having expertise in planning and public law and the arbitration taking place in England, the provisions of Article 37 and the Arbitration Rules in Schedule 13 apply to any dispute arising between the Undertaker and the Spirit Energy Group under this Part unless otherwise agreed in writing by the Spirit Energy Group.

**Proposed Drafting Amendments to Part 2 of Schedule 11.**

1. The term "collision" in paragraph 5(5) and (6) of Part 2 of Schedule 11 shall include "allision".

## ADDENDUM TO PROTECTIVE PROVISIONS

It is Spirit Energy's primary position that each of the infrastructure assets and activities specified in the Protective Provisions should be protected by requiring a stand off distance (radius) of **6nm** measured from the centre of the relevant asset, subject to certain qualifications in the case of the Proposed C6 and C7 subsea well-heads; the G5 subsea well-head and the Grove Platform. The standoff distance of 6nm is required, in the absence of an ALARP assessment by the Applicant, to ensure that the risk profile in relation to the risks addressed by the Protective Provisions remain at their current ALARP level. This is in line with the EN3 policy expectation (paragraph 2.6.183-186) cast by the NPS expressly onto the Applicant requiring that it will reduce risks to as low as reasonably practicable by site selection and design, but here in circumstances where the Rochdale Envelope approach is relied on such that design siting of individual wind turbine generators cannot be known at this stage whereas overall siting (by way of areas of exclusion around the eastern edge of the proposed array) can be addressed at this (outline) stage.

In the event that the ExA and the Secretary of State disagree that EN-3, paragraphs 2.6.156 and 2.6.183 require the Applicant to reduce potential affects (here, risks) to as low as reasonably practicable, then, an appropriate stand-off distance remains required to ensure the successful co-existence of Spirit Energy's said infrastructure and activities (existing infrastructure and exploration and future infrastructure for gas exploitation) with the Hornsea 3 Project pursuant to EN-3, paragraph 2.6.181 (and in line with the Marine Plan also). In these circumstances, Spirit Energy have considered the information which is presently available to them and concluded that a stand-off distance (radius) of **3.3nm** is likely to achieve that policy objective, albeit *without* being ALARP pursuant to EN-3, paragraph 2.6.183 or otherwise. This conclusion is informed by the outcome of the helicopter simulator trials conducted by Spirit Energy on 31 March 2019 and is justified more fully in this submission. While turbines within this 3.3nm of Spirit Energy's infrastructure will raise the risk profile for Spirit Energy's operations and personnel (and so not itself reduce the risk to as low as reasonably practicable (paragraph 2.6.183 of EN-3 for aviation and vessel allision, and paragraph 2.6.156 for vessel allision), the increased risk resulting from the proposed physical intervention of large turbines in close proximity to Spirit Energy's exploitation and exploration activities is judged by Spirit Energy on the presently available information to be likely to be tolerable. In addition the commercial cost to Spirit Energy, in terms of "lost days" at that distance is judged by it also to be acceptable. Therefore, the identified risks, after having taken account of the said Protective Provisions would not be unacceptable (in EN-3 paragraph 2.6.184, last sentence, terms) and would be reduced sufficiently (in paragraph 2.6.186, last sentence, terms).

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**PROTECTIVE PROVISIONS (2) 01.04.19**

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**SCHEDULE 9**

**Part 8**

**For Protection of Spirit Energy North Sea Limited, Spirit Energy Resources Limited and Spirit Energy Nederland B.V. and their Co-Venturers**

**Application**

1. For the protection of the Spirit Energy Group referred to in this part of this Schedule the following provisions must, unless otherwise agreed in writing between the undertaker and the Spirit Energy Group, the affected undertaking concerned, have effect.

**Interpretation**

2. In this Part of this Schedule -

**“Chiswick Restricted Area”** means a volume of obstacle-free space comprising two cylinders each with a horizontal radius of 3.3<sup>1</sup> nautical miles extending from points at (i) the centre of the helideck of the Chiswick Platform; and (ii) the centre point of the Kew subsea well-head, and extending vertically from mean sea level.

**“Grove Platform Restricted Area”** means a volume of obstacle-free space comprising a cylinder with a horizontal radius of 3.3<sup>1</sup> nautical miles extending from a point at the centre of the helideck of the Grove Platform, and extending vertically from mean sea level.

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<sup>1</sup> Without prejudice to the requirements of EN-3 and to Spirit Energy’s evidence on the need for the Applicant to carry out pursuant to EN-3 paragraphs 2.6.156 and 2.6.183 an assessment that reduces identified risks to existing offshore infrastructure and activities to as low as reasonably practicable (an ALARP assessment), and Protective Provision (1) being an acceptable proxy in light of that breach of EN-3 by the Applicant, Spirit Energy has itself undertaken consideration of the risks to the safe operation of its infrastructure and activities and currently considers that this alternative Protective Provisions (2) requiring an obstacle free column of a radius of at least 3.3NM would be sufficient to result in a not unacceptable level of risk (in the language of EN-3, paragraph 2.6.184, and a sufficiently low level of risk (in the language of paragraph 2.6.186) that, after imposition of the Protective Provision, then the ExA and Secretary of State should not refuse to grant consent. Each of the two sets of Protective Provisions accommodates the potential for the Applicant and Spirit Energy to co-operate with clear parameters so as to seek a more refined detailed radii for each of the said infrastructure elements and activities.

**“Grove G5 Restricted Area”** means a volume of obstacle-free space comprising a cylinder with a horizontal radius of 3.3<sup>1</sup> nautical miles extending from a point at the centre of the Grove G5 subsea well-head, and extending vertically from mean sea level.

**“C6 Restricted Area”** means a volume of obstacle-free space comprising a cylinder with a horizontal radius of 3.3<sup>1</sup> nautical miles extending from a point at the centre of the Proposed C6 subsea well-head, and extending vertically from mean sea level.

**“C7 Restricted Area”** means a volume of obstacle-free space comprising a cylinder with a horizontal radius of 3.3<sup>1</sup> nautical miles extending from a point at the centre of the Proposed C7 subsea well-head, and extending vertically from mean sea level.

**“C6 Milestones”** means the following milestones -

- (i) A Development Plan for the Proposed C6 subsea well-head shall be produced by Spirit Energy and shared in writing with the Undertaker on or before 31 December 2020.
- (ii) Spirit Energy has entered into a contract or other legally binding commitment to lease or otherwise procure a drilling rig and provided written confirmation of this to the Undertaker on or before 31 December 2021.
- (iii) Drilling for oil and / or gas at the Proposed C6 subsea well-head has commenced on or before 31 December 2022.

**“C7 Milestones”** means –

- (i) A Development Plan for the Proposed C7 subsea well-head shall be produced by SE and shared in writing with the Undertaker on or before 31 December 2023.
- (ii) Spirit Energy has entered into a contract or other legally binding commitment to lease or otherwise procure a drilling rig and provided written confirmation of this to the Undertaker on or before 31 December 2024.
- (iii) Drilling for oil and / or gas at the Proposed C7 subsea well-head has commenced on or before 31 December 2025.

**“Completion of Decommissioning”** means the date on which the actions required for the decommissioning of the Grove Platform and any related infrastructure in accordance with the Decommissioning Plan are complete.

**“Decommissioning Plan”** means a plan for the decommissioning of the Grove Platform which is approved by the OGA.

**“Development Plan”** means a written exploration and development programme for the Proposed C6 subsea well-head or the Proposed C7 subsea well-head as the context so admits, including details and location of the related infrastructure but only to the extent that the details may impact on the detailed design or development of the authorised works.

**“Proposed C6 subsea well-head”** means the proposed subsea well-head located within the area of sea bed within loxodromes drawn between the following coordinates:

002° 41' 30.7736" E	53° 56' 38.9480" N
002° 42' 25.6172" E	53° 56' 39.0852" N
002° 42' 25.1636" E	53° 57' 43.7954" N
002° 41' 30.2965" E	53° 57' 43.6581" N
002° 41' 30.7736" E	53° 56' 38.9480" N

**“Proposed C7 subsea well-head”** means the proposed subsea well-head located within the area of sea bed within loxodromes drawn between the following coordinates:

002° 40' 47.7256" E	53° 56' 09.6506" N
002° 41' 42.5584" E	53° 56' 09.7933" N
002° 41' 42.4405" E	53° 56' 25.9708" N
002° 40' 47.6018" E	53° 56' 25.8282" N
002° 40' 47.7256" E	53° 56' 09.6506" N

**“Chiswick Field”** means the hydrocarbon accumulation underlying blocks 49/4a, 49/4c and 49/4b of the United Kingdom Continental Shelf.

**“Chiswick Platform”** means the production and processing platform installed in block 49/4a of the United Kingdom Continental Shelf for the exploitation of the Chiswick Field.

**“Co-Venturer”** means any other entity with whom Spirit Energy is or may be from time to time a party to a joint operating agreement or unitisation agreement or similar agreement relating to the operations of the Relevant platforms, the J6A Platform and/or the Relevant Subsea Well Heads, and any future successors and/or assignees of such Co-Venturer.

**“Grove Field”** means the hydrocarbon accumulation underlying blocks 49/10a and 49/9c of the United Kingdom Continental Shelf.

**“Grove Platform”** means the production and processing platform installed in block 49/10a of the United Kingdom Continental Shelf for the exploitation of the Grove Field.

**“Grove G5 subsea well-head”** means the existing subsea well-head located at (lat/long: 53° 43' 04.080", N 02° 49' 48.020" E).

**“J6A Platform”** means the production and processing platform installed in block J6 of the Netherlands Continental Shelf for the exploitation of the Markham Field.

**“Kew subsea well-head”** means the existing subsea well-head located at (lat/long: 53° 57' 20.520" N, 2° 47' 9.395" E).

**“Markham Field”** means the hydrocarbon accumulation underlying blocks 49/5a and 49/10b of the United Kingdom Continental Shelf and blocks J3b and J6 of the Netherlands Continental Shelf.

**“OGA”** means the Oil and Gas Authority, a company incorporated under the Companies Acts (Company Number 09666504), having its registered office at 21 Bloomsbury Street, London, WC1B 3HF, and any successor thereto as oil and gas industry regulator.

**“Relevant platforms”** means, together, each of the Chiswick Platform, the Grove Platform, and the Relevant Subsea Well Heads.

**“Relevant Subsea Well Heads”** means, together, each of Grove G5 subsea well-head, the Kew subsea well-head, and the Proposed C6 subsea well-head and Proposed C7 subsea well-head.

**“Spirit Energy”** means one or each of (as applicable) Spirit Energy North Sea Limited (UK Company Number: 04594558), Spirit Energy Resources Limited (UK Company Number: 02855151) and/or Spirit Energy Nederland B.V. (Company Number: 34081068) who are owners of the Relevant platforms, the J6A Platform and/or the Relevant Subsea Well Heads, and any future successors and/or assignees.

**“Spirit Energy Group”** means Spirit Energy, its Co-Venturers (as applicable), and its and their respective affiliates.

**“Vessel Exclusion Area”** means in so far as relevant, the volumes extending from the sea surface at mean sea level down to the sea bed (i) bounded to the east by a notional loxodrome drawn through and extending beyond the centres of the Chiswick Platform and Grove Platform, to the west by a loxodrome parallel to that loxodrome and at all times 2 nm to the east of it, to the north by the line of latitude passing through the northernmost point on the perimeter of the windfarm array, to the south by the line of latitude passing through the southernmost point on the perimeter of the windfarm array and (ii) bounded by a circle of radius of 2 nautical miles centred on the centre point of each of the Relevant Subsea Well Heads.

**“Hornsea Project 3 Infrastructure”** means any temporary or permanent infrastructure (including but not limited to vessels supporting wind generator turbine infrastructure, buoys, anchor chains, pipes and cables).

**“Buoy”** means any buoy as defined in either Article 2(1) of the Order or in paragraph 1(1) of Part 1 of Schedule 11.

**“Vessel”** means any vessel as defined in Article 2(1) of the Order or in paragraph 1(1) of Part 1 of Schedule 11.

**“Predictive Radar Early Warning System”** means measures including a radar early warning system used to monitor and track the positions of vessels proximate to the Relevant Platforms and the J6A Platform with associated software providing a multi-sensor integrated marine surveillance system with a predictive early warning capability.

**“Works No. 1”** means the area of land within the Order Land specified in paragraph 5 of Part 1 of Schedule 11, the volume of water above it, and the volume of air above that water.

**“Includes”** is to be construed without limitation unless the contrary intention appears.

**“Order Land”** means the Order Land as defined in Article 2(1) of the Order.

**“Undertaker”** means the Undertaker as defined in Article 2(1) of the Order, and any entity within Article 5(1).

## Protective Provisions

### Chiswick Platform

3. No authorised development described in paragraph 1, Work No. 1 (a) and (b) and Work No. 2 (a) and (b) of Part 1 of Schedule 1 may be within the Chiswick Restricted Area.

### Grove Field

4. No authorised development described in paragraph 1, Work No. 1 (a) and (b) and Work No. 2 (a) and (b) of Part 1 of Schedule 1 may be within the Grove G5 Restricted Area until the first of January 2028, or such earlier date as the Spirit Energy Group may advise in writing, at which date the restriction within this paragraph shall have no further effect.
5. No authorised development described in paragraph 1, Work No. 1 (a) and (b) and Work No. 2 (a) and (b) of Part 1 of Schedule 1 may be within the Grove Platform Restricted Area until Completion of Decommissioning or the first of January 2032 whichever is the earlier], at which date the restriction within this paragraph shall have no further effect.

### C6, C7 Sub-sea Well Locations

6. Subject to paragraphs 7 and 8, no authorised development described in paragraph 1, Work No. 1 (a) and (b) and Work No. 2 (a) and (b) of Part 1 of Schedule 1 may be within the C6 Restricted Area or the C7 Restricted Area.
7. The restriction on development within the C6 Restricted Area in terms of paragraph 6 is subject to the timeous occurrence of each of the C6 Milestones, failing which the said restriction shall have no further effect.
8. The restriction on development within the C7 Restricted Area in terms of paragraph 6 is subject to the timeous occurrence of each of the C7 Milestones, failing which the said restriction shall have no further effect.

### Vessel Exclusion Area

9. Unless otherwise agreed in writing by the Spirit Energy Group, no authorised development comprising Hornsea Project 3 Infrastructure under any deemed licence in terms of paragraph 31 of Part 6 of the Order and paragraph 3 of Part 1 of Schedule 11, or otherwise permitted, may be constructed within any Vessel Exclusion Area.

### REWS

10. Unless otherwise agreed in writing by the Spirit Energy Group, no electricity shall be generated by the authorised development unless and until: (i) a validation test in relation to the existing Predictive Radar Early Warning System operating from the J6A Platform has been carried out; (ii) the results of the aforementioned validation test have been shared in writing with the Spirit Energy Group; and (iii) the results of the validation test demonstrate to the Spirit Energy Group's satisfaction in writing acting reasonably



that the Predictive Radar Early Warning System will continue to operate effectively in relation to the Spirit Energy Group's Relevant platforms and the J6A Platform following construction and installation of the authorised development, such that a minimum of 20 minutes warning of potential vessel allision with that infrastructure may be given.

11. Prior to commencing construction of the authorised development described in paragraph 1, Work No. 1 (a) and (b) and Work No. 2 (a) and (b) of Part 1 of Schedule 1, the Undertaker and the Spirit Energy Group shall enter into a good working and communications protocol. The purpose of this protocol is to ensure the safe working of each of the parties' supply and work vessels during the construction, operational and decommissioning phases of the authorised development. The protocol shall be observed and complied with by both the Undertaker and the Spirit Energy Group unless or until any alternative co-operation agreement has been entered into.
12. Unless the Spirit Energy Group has been consulted in writing for 60 days and such representations as it may make to the Undertaker have been included in an application under paragraph 14 of Part 2 of Schedule 11, no application may be made under that paragraph.
13. Subject to a minimum of three arbitrators being appointed with at least one of the arbitrators appointed having expertise in planning and public law and the arbitration taking place in England, the provisions of Article 37 and the Arbitration Rules in Schedule 13 apply to any dispute arising between the Undertaker and the Spirit Energy Group under this Part unless otherwise agreed in writing by the Spirit Energy Group.

**Proposed Drafting Amendments to Part 2 of Schedule 11.**

1. The term "collision" in paragraph 5(5) and (6) of Part 2 of Schedule 11 shall include "allision".

## ADDENDUM TO PROTECTIVE PROVISIONS

It is Spirit Energy's primary position that each of the infrastructure assets and activities specified in the Protective Provisions should be protected by requiring a stand off distance (radius) of **6nm** measured from the centre of the relevant asset, subject to certain qualifications in the case of the Proposed C6 and C7 subsea well-heads; the G5 subsea well-head and the Grove Platform. The standoff distance of 6nm is required, in the absence of an ALARP assessment by the Applicant, to ensure that the risk profile in relation to the risks addressed by the Protective Provisions remain at their current ALARP level. This is in line with the EN3 policy expectation (paragraph 2.6.183-186) cast by the NPS expressly onto the Applicant requiring that it will reduce risks to as low as reasonably practicable by site selection and design, but here in circumstances where the Rochdale Envelope approach is relied on such that design siting of individual wind turbine generators cannot be known at this stage whereas overall siting (by way of areas of exclusion around the eastern edge of the proposed array) can be addressed at this (outline) stage.

In the event that the ExA and the Secretary of State disagree that EN-3, paragraphs 2.6.156 and 2.6.183 require the Applicant to reduce potential affects (here, risks) to as low as reasonably practicable, then, an appropriate stand-off distance remains required to ensure the successful co-existence of Spirit Energy's said infrastructure and activities (existing infrastructure and exploration and future infrastructure for gas exploitation) with the Hornsea 3 Project pursuant to EN-3, paragraph 2.6.181 (and in line with the Marine Plan also). In these circumstances, Spirit Energy have considered the information which is presently available to them and concluded that a stand-off distance (radius) of **3.3nm** is likely to achieve that policy objective, albeit *without* being ALARP pursuant to EN-3, paragraph 2.6.183 or otherwise. This conclusion is informed by the outcome of the helicopter simulator trials conducted by Spirit Energy on 31 March 2019 and is justified more fully in this submission. While turbines within this 3.3nm of Spirit Energy's infrastructure will raise the risk profile for Spirit Energy's operations and personnel (and so not itself reduce the risk to as low as reasonably practicable (paragraph 2.6.183 of EN-3 for aviation and vessel allision, and paragraph 2.6.156 for vessel allision), the increased risk resulting from the proposed physical intervention of large turbines in close proximity to Spirit Energy's exploitation and exploration activities is judged by Spirit Energy on the presently available information to be likely to be tolerable. In addition the commercial cost to Spirit Energy, in terms of "lost days" at that distance is judged by it also to be acceptable. Therefore, the identified risks, after having taken account of the said Protective Provisions would not be unacceptable (in EN-3 paragraph 2.6.184, last sentence, terms) and would be reduced sufficiently (in paragraph 2.6.186, last sentence, terms).

## SCHEDULE 9, PART 10

### Protection for Oil and Gas Licensee

#### 1 Application

- 1.1 For the ~~P~~rotection of the Licensee from time to time of United Kingdom Petroleum Production Licences P83, ~~and~~ P468, [and 385/111/228/EAM](#) unless otherwise agreed in writing between the Undertaker and the Licensee the provisions of this part of this Schedule shall have effect for so long as those Licences shall remain in full force and effect.
- 1.2 In the event that one or more of the Licences is terminated and no longer has effect, the obligations on the Undertaker in this Schedule shall no longer have effect in so far as they relate to the Licensee's Works under the terminated Licence(s).

#### 2 Interpretation

- 2.1 In this Part of this Schedule:

2.1.1 "Applicable Laws" means applicable laws, rules, orders, guidelines and regulations, including without limitation, those relating to health, safety and the environment and logistics activities such as helicopter and vessel operations;

2.1.2 "C6 Protected Area" means the spherical area of seabed, [including the sea and air space directly above it](#), having a radius of ~~3.3[4]~~ nautical miles from 479776 Easting, 5978186 Northing (ETRS89 UTM Zone 31N) in respect of the proposed C6 wellhead in Licence P468, which is subject to Licences held by the Licensee shown delineated dark blue on the Protective Provisions Plan;

2.1.3 "C7 Protected Area" means the spherical area of seabed, [including the sea and air space directly above it](#), having a radius of ~~3.3[4]~~ nautical miles from 479444 Easting, 5976524 Northing (ETRS89 UTM Zone 31N) in respect of the proposed C7 wellhead in Licence P468, which is subject to Licences held by the Licensee shown delineated light blue on the Protective Provisions Plan;

~~2.1.3~~ **Comment** - [there is no reasoned justification for a radius of 1nm given the requirement to be accessible by helicopter. If it is appropriate to offer protection \(as Spirit Energy say\) then logically the protected area should have the same radius as in the case of Chiswick and Grove;](#)

2.1.4 "Completion of Decommissioning" means [the date on which the actions required for the decommissioning of the Grove Platform and any related infrastructure in accordance with the Decommissioning Plan are complete;](#)

2.1.5 "Decommissioning Plan" means [a plan for the decommissioning of the Grove Platform and any related infrastructure which is approved by the OGA;](#)

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2.1.42.1.6 "Good Offshore Wind Farm Construction Practice" means the application of those methods and practices customarily used in construction of wind farms in the United Kingdom Continental Shelf with that degree of diligence and prudence reasonably and ordinarily exercised by experienced operators and contractors engaged in the United Kingdom Continental Shelf in a similar activity under similar circumstances and conditions;

2.1.52.1.7 "Good Oilfield Practice" means the application of those methods and practices customarily used in good and prudent oil and gas field practice in the United Kingdom Continental Shelf, including those applicable to the aviation industry serving oil and gas operators, with that degree of diligence and prudence reasonably and ordinarily exercised by experienced operators engaged in the United Kingdom Continental Shelf in a similar activity under similar circumstances and conditions;

2.1.62.1.8 "Guidance" means the "Oil and gas clause in Crown Estate leases, Guidance on procedures for independent valuation where necessary" published by the Department of Energy and Climate Change in June 2014, or any similar supplementary or replacement policy;

2.1.9 "Grove Platform Restricted Protected Area" means the spherical area of seabed, including the sea and air space directly above it, having a radius of 3.3~~2.8~~ nautical miles from 490342.72 Easting, 5951915.84 Northing (ETRS89 UTM Zone 31N) that point being the centre of the existing Grove platform in Licence P83 operated by the Licensee shown delineated green on the Protective Provisions Plan;

2.1.10 "Grove G5 Restricted Area" means the spherical area of seabed, including the sea and air space directly above it, having a radius of 3.3 nautical miles from [ insert coordinates] (ETRS89 UTM Zone 31N) that point being the centre of the existing sub-sea wellhead known as G5 in Licence P83 operated by the Licensee shown delineated [ add colour ] on the Protective Provisions Plan;

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2.1.7**Comment** – the Restricted Areas for the G5 and Kew wellheads (see para 2.1.21 below) are not currently shown on the Applicant's Protective Provisions Plan, but are shown enclosed by circles with a radius of 3.3nm on the Spirit Energy Protective Provisions Plan.

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2.1.11 "Licences" means United Kingdom Petroleum Production Licences P83, and P468 and 385/111/228/EAM;

2.1.8**Comment** – additional licence relates to J6A. The block for each Licence should also be added.

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2.1.92.1.12 "Licensee" means anythe licensee from time to time of the Licences (or any one of them);

2.1.102.1.13 "Licensee's Works" means ~~the operation of~~ any infrastructure ~~existing in the Grove Protected Area at the time of this Order, or~~ to be installed in the C6 Protected Area or C7 Protected Area after the date of this Order, and owned, occupied or maintained by or on behalf of the Licensee, and authorised by the Licences;

2.1.14 "Ministerial Statement" means the written statement given by the Secretary of State for Energy and Climate Change to the UK Parliament regarding Crown Estate Leases for Offshore Renewables Projects on 12 July 2011, or any similar supplementary or replacement policy;

2.1.142.1.15 "OGA" means the Oil and Gas Authority, a company incorporated under the Companies Acts (Company Number 09666504), having its registered office at 21 Bloomsbury Street, London, WC1B 3HF, and any successor thereto as oil and gas industry regulator;

2.1.142.1.16 "Plan of the Licensee's Works" means an exploration and development programme and proposed details and location of Licensee's Works and minimum requirements known at that time in accordance with Good Oilfield Practice and Applicable Laws to enable the Licensee to, as applicable, explore, appraise, develop and/or decommission hydrocarbon resources as permitted by the Licences, and access the Licensee's Works;

2.1.142.1.17 "Plan of the Undertaker's Works" means a construction programme and details of the proposed location of the Undertaker's Works and minimum requirements known at that time such as safety in accordance with Good Offshore Wind Farm Construction Practice and Applicable Laws to enable the Undertaker to construct and operate the Undertaker's Works;

2.1.142.1.18 "the Protected Areas" means ~~the Grove Protected Area and~~ the C6 Protected Area and the C7 Protected Area, and Protected Area shall be construed accordingly;

2.1.142.1.19 "the Protective Provisions Plan" means the plan entitled Protective Provisions Plan and certified as the Protective Provisions Plan for the purposes of this Part of this Schedule;

2.1.142.1.20 "Proximity Agreement" means an agreement entered on reasonable terms between the Undertaker and the Licensee ~~in respect of the Undertaker's Works~~ to reconcile and protect the interests of the parties as are known at the time to secure the implementation of the Undertaker's Works and the Licensee's Works, taking account of the matters in paragraph 4.8;

2.1.142.1.21 "Chiswick Restricted Area" means the spherical areas of seabed, including the sea and air space directly above those areas, each having a radius of ~~3.32-8~~ nautical miles from (i) 483310.36 Easting, 5976788.24 Northing (ETRS89 UTM Zone 31N) that point being the centre of the existing Chiswick platform and (ii) latitude/longitude: 53°

57' 20.520" North, 2° 47' 9.395" East, that point being the centre of the existing sub-sea wellhead known as Kew, both in Licence P468 operated by the Licensee shown delineated purple and [add colour] on the Protective Provisions Plan;

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2.1.22 "Restricted Areas" means the Chiswick Restricted Area, and the Grove Restricted Area and the Grove G5 Restricted Area;

2.1.182.1.23 "Relevant Activities" means all development activity relating to the carrying on of the Undertaker's and Licensee's businesses within, or adjacent to the Protected Areas and the Restricted Areas, including (but not limited to) the preparation of development proposals, the submission of applications for statutory consents associated with those proposals and consultation in respect thereof, the acquisition of or application for new licence oil or gas blocks;

2.1.192.1.24 "REWS" means the radar early warning system fixed to the existing J6A platform located at 496306.16 Easting, 5963872.35 Northing (ETRS89 UTM Zone 31N) operated by the Licensee and shown on the Protective Provisions Plan;

2.1.202.1.25 "Undertaker's Works" means the works permitted by this Order within the Protected Areas.

**3 Restriction on authorised development**

3.1 No wind turbine generator or any other temporary or permanent infrastructure, including buoys or cables, shall be erected in, or extend into the Chiswick Restricted Area, unless otherwise agreed in writing between the Licensee and the Undertaker.;

3.2 No wind turbine generator or any other temporary or permanent infrastructure, including buoys or cables, shall be erected in, or extend into the Grove G5 Restricted Area until the first of January 2028, or such earlier date as the Licensee may advise in writing, at which date the restriction within this paragraph shall have no further effect.

3.3 No wind turbine generator or any other temporary or permanent infrastructure, including buoys or cables, shall be erected in, or extend into the Grove Platform Restricted Area until Completion of Decommissioning or the first of January 2032 whichever is the earlier, at which date the restriction within this paragraph shall have no further effect.

**Comment** – as existing, operational facilities, Grove and G5 merit protection on the same initial footing as Chiswick, but it is accepted that this may be scaled back in line with decommissioning or appropriate longstop dates in due course.

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**3.4** **Comment** – no marine protection area/channel has been included within these provisions. As supported by the evidence, before the ExA, Spirit Energy considers that the relevant marine provisions are incorporated from its own proposed protective provisions.

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#### 4 Proximity Agreement

4.1 Save as provided in paragraphs 4.5, ~~4.84.7~~ and ~~4.94.40~~ no part of the Undertaker's Works shall commence until in respect of the relevant Protected Area either:

4.1.1 one or more Proximity Agreement(s) has been ~~concluded~~ agreed between the Undertaker and the Licensee in respect of the Undertaker's Works and the Licensee's Works; or

4.1.2 the Undertaker and the Licensee shall have agreed in writing that no Proximity Agreement is required in respect of the Undertaker's Works and the Licensee's Works.

4.2 Preparation of a Proximity Agreement by the Undertaker must commence when the Undertaker serves written notice on the Licensee of the Undertaker's intention to commence the Undertaker's Works.

4.3 Any such notice must be served within no less than 12 months of and no more than 24 months before the intended commencement date of the Undertaker's Works and shall include a Plan of the Undertaker's Works and a request to the Licensee to produce a Plan of the Licensee's Works.

4.4 In response to the notice the Licensee shall produce a Plan of the Licensee's Works within 28 days of service of the notice.

4.5 Preparation of a Proximity Agreement must be concluded within 3 months of the date for production of the Plan of the Licensee's Works under paragraph 4.4 above.

4.6 If the Undertaker reasonably considers that the Plan of the Licensee's Works produced pursuant to paragraph 4.4 above provides insufficient detail of:

4.6.1 the existence of economically recoverable ~~a realistic~~ oil and gas ~~prospect~~ within the areas subject to the Licences (or any one of them);

4.6.2 the nature and location of the Licensee's Works in order to enable the Undertaker to define or mitigate the effects of the Undertaker's Works on the Licensee's Works; and/or

~~4.6.3 [any area of sea and/or airspace required for the Licensee's Works having been minimised in light of (i) above to enable a Proximity Agreement to be concluded which contains ongoing limitations on the programming siting design construction or operation of the Undertaker's Works];~~ any reasonable attempts to reduce the sea and/or airspace required for the Licensee's Works given the potential impact on the Undertaker's Works.

4.6.3 Comment – initial drafting at [4.6.3] is not easily understood. Accordingly alternative drafting is suggested.

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4.7 then (as applicable) the Undertaker must in writing notify the Licensee of the additional detail required, with a reasoned justification therefor, whereupon the Licensee must use reasonable endeavours to provide all such additional detail within 28 days of such notification by the Undertaker.

~~4.8~~4.7 Subject to paragraph 4.9 below, paragraph 4.1 shall not apply if the plan of the Licensee's Works or additional detail provided pursuant to paragraph 4.6 above provides insufficient detail for the purposes set out in paragraph 4.1 above.

~~4.9~~4.8 The Proximity Agreement must be based on the Plan of the Licensee's Works and the Plan of the Undertaker's Works and must take account of:

~~4.8.1~~ The impact of the nature and location of the Licensee's Works on any Plan of the Undertaker Licensee's Works as known at that time;

~~4.9.14~~4.8.2 The impact of the nature and location of the Undertaker's Works on any Plan of the Licensee's Works as known at that time;

~~4.9.24~~4.8.3 the location and extent of sea and/or airspace required for the Licensee's Works (including all applicable exclusive zones) as known at that time;

~~4.9.34~~4.8.4 all such evidence as is available at the time to support the existence of an oil and gas prospect within, adjacent to or accessed through the Protected Areas ~~areas subject to the Licences;~~

~~4.9.44~~4.8.5 the objectively assessed ability of the Licensee to reduce or remove its sea and/or airspace area requirement under (ii) above in light of evidence at (iii) above, whether with immediate effect or at a specified later date;

~~4.9.54~~4.8.6 the date by which the Licensee will seek to commence exploitation pursuant to the Licensee's Works, ~~or at which works of exploration, will cease as known at that time;~~

~~4.9.64~~4.8.7 the objectively assessed ability of the Undertaker to maintain areas of air and sea space free of obstacles around the Licensee's Works through siting and design of the Undertaker's Works on any Plan of the Undertaker's Works as known at that time and based on the requirement under (4.8.3) above in light of evidence at (4.8.4) above, whether with immediate effect or at a specified later date;

~~4.8.8~~ the objectively assessed minimum ~~feasible exclusive zones~~, buffer zones and/or safety zones required for safe construction and operation of and between the Undertaker's Works and the Licensee's Works, including the ability to access and egress each;

~~4.9.74~~4.8.9 the Undertaker's objectively assessed ability to (i) design a detailed layout and (ii) phase the Undertaker's Works so as to minimise impact on or interference with the Licensee's Works;

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~~4.9.8~~4.8.10 protocols protective of navigation communication and use of the sea or air by third parties;

~~4.9.9~~4.8.11 possible future transfer of the benefit of the Order or of the Licence; and

~~4.9.10~~4.8.12 the national objectives of co-existence and the ongoing commercial viability of each of (i) the authorised development permitted under the Order and (ii) the Licensee's Works and related~~Related activities, where both are permitted together with exploration for and commercial exploitation of oil and gas~~ within the Protected ~~a~~Areas.

~~4.10.4~~9 If no Proximity Agreement is concluded, or the parties shall not have agreed whether paragraph 4.1 applies within the period specified in paragraph 4.5, the outstanding matters in dispute must be determined in accordance with Article 37 (Arbitration) of this Order. The Undertaker's Works must not commence until the final determination of the arbitrator has been made and must only be implemented in accordance with the arbitrator's said determination which is final and binding on the parties (save for manifest or legal error):

~~4.10.14~~9.1 the arbitration shall be decided by a panel of three~~sole~~-arbitrators whose appointment shall be agreed by the parties, but where the parties fail to agree to appoint ~~an~~ panel arbitrator within 28 days of the delivery of a notice of arbitration, then upon application the Secretary of State will appoint ~~an~~ panel of arbitrators~~arbitrator~~ within 28 days. At any time prior to the appointment by the Secretary of State the parties may make an agreed appointment;

~~4.10.24~~9.2 the arbitrators shall ~~include~~be (i) a person (which may include~~ing~~ one who has retired) with not less than twenty years' aviation, radar or shipping and marine navigation, experience (as relevant and applicable) associated with a combination of offshore oil and gas development and offshore wind farm development ~~or as a lawyer~~ or other professional advisor serving those industries and having that experience and (ii) an infrastructure planning lawyer with not less than twenty years' experience, including experience in offshore industries;

~~4.10.34~~9.3 ~~the intention of the parties is that, so far as practicable, the said panel~~arbitrator should make a determination within 3 months of appointment; and

~~4.10.44~~9.4 the seat of arbitration shall be London.

## 5 Radar Early Warning System

5.1 If the Licensee considers there to be an adverse impact on the REWS caused by the installation and/or operation of the wind turbine generators comprised in the authorised development the Licensee may serve notice of that impact on the Undertaker. The notice served under this paragraph must be accompanied by a REWS mitigation proposal specifying:

5.1.1 the nature and extent of the impact;

- 5.1.2 the evidence in support of the impact;
- 5.1.3 mitigation the Licensee reasonably believes would resolve the impact; and
- 5.1.4 programme and cost estimate for implementing and maintaining the mitigation.

5.2 On receipt of a notice served under paragraph 5.1 the Undertaker shall forthwith ensure that:

5.2.1 ~~the wind turbine generators affecting the REWS shall cease to operate, and~~

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5.2.2 no additional wind turbine generators shall be installed in or adjacent to the area of authorised works affecting the REWS, -until -

5.2.2.1 an agreed REWS mitigation is implemented in terms of paragraph 5.4; ~~or~~

5.2.2.2 the Licensee gives notice in writing that no mitigation is required, or

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5.2.2.3 It is determined under paragraph 4.9 that no such mitigation is required.

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5.25.3 The parties shall thereafter use reasonable endeavours to agree the terms of the REWS mitigation proposal within six weeks of the Undertaker's receipt of the notice and REWS mitigation proposal.

5.35.4 The Licensee shall thereafter implement and maintain ~~the the agreed~~ REWS mitigation proposal as agreed or determined under paragraph 4.95.5 within 28 days of such agreement or determination, the cost of which shall be borne by the Undertaker, including the cost of assessing any radar impacts and reporting thereon, in accordance with the terms of the REWS mitigation proposal.

5.5 If the parties cannot agree any matter prescribed by paragraph 5.1, then the matters in dispute must be determined in accordance with Article 37 (Arbitration) of this Order and the provisions of paragraph 4.9.1 to 4.9.4 of this Part of the Schedule shall apply to those proceedings.

5.4 **Comment** – these provisions as initially drafted allow the turbines to operate in advance of testing and to continue to operate if a problem is identified. The alternative is to provide for temporary shutdown in the event of a problem, or require testing to take place in advance of full operation.

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## 6 Provision of information

Without prejudice to any other rights or obligations under this Part of the Schedule the Licensee and the Undertaker shall from time to time keep each other informed of Relevant Activities such that the Licensee and the Undertaker may seek to agree solutions to allow the Undertaker's works and the Licensee's Works to successfully co-exist as far as reasonably practicable or if later until completion of activities required under any statutory decommissioning plan required under the

Petroleum Act 1998 in relation to the Licences and taking place within the areas subject to the Licences.

**7 Compensation**

Nothing in this Part of the Schedule shall affect any rights or obligations or assessment of compensation in accordance with the Ministerial Statement and the Guidance (as applicable).

## AviateQ International Limited

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### AW139 Level D Full Flight Simulator Flight Approaches and Departures to an Offshore Helideck Positioned in Close Proximity to Wind Turbines



**Date:** 31<sup>st</sup> March 2019  
**By:** Jacob Bart (Test pilot, technical pilot AW139)  
Chris Schlepers (TRI/TRE AW139)  
Henk van Erkelens Pilot (Observer)

**Distribution:**

- Spirit Energy
-

Hornsea Three Project: AW139 Flight Simulator Evaluation

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## 1 INTRODUCTION

- 1.1 In June 2018 Ørsted submitted a draft Development Consent Order for the proposed Hornsea Project Three windfarm.
- 1.2 The examination of the DCO application by the Examining Authority commenced on 2 October 2018 and will close on 2 April 2019.
- 1.3 During the course of the examination there has been considerable dialogue and several meetings between Ørsted and their advisors, Spirit Energy and their advisors and the helicopter operators operating in the North Sea. Through this process, calculations were made of the footprints required in order to execute the various helicopter manoeuvres required to take off and land at offshore installations under a variety of weather conditions. The helicopter operators involved proposed that these calculations should be validated by means of simulator trials.
- 1.4 AviateQ, who are aviation advisors to Spirit Energy, secured time on an AW139 full motion simulator at CopterSafety in Helsinki in order to enable trials to be undertaken prior to the end of the examination. Ørsted and each of the helicopter operators were invited to assist in the planning and to attend. The trials took place on Sunday 31<sup>st</sup> March with a test pilot/technical pilot AW139 employed by the aviation services provider which currently supports both the Applicant's and Spirit Energy's Southern North Sea operations; an AW139 Type Rated Instructor and Type Rated Examiner - a training pilot with North Sea offshore experience working for Coptersafety; and a pilot observer – a former national aviation regulator now engaged by AviateQ. Simulator staff were also in attendance supporting the simulations.
- 1.5 This document provides an initial report and assessment of the simulator trials. It should be noted that for completeness all flights undertaken are recorded whether or not the findings contribute to the conclusions and recommendations.
- 1.6 This document is to be read as an addendum to the AviateQ “Proposed Hornsea Three Offshore Wind Farm” report, date 31st October 2018.

## 2 SCOPE

- 2.1 The scope of the flight test evaluations was aimed at delivering an objective result with the main focus on continued safe operations involving the transportation of passengers and was designed to determine:
  - a. the dimensions of the Helideck Protected Zone (HPZ - unobstructed environment) required around an oil and gas facility located in close proximity to a proposed windfarm array with wind turbines spaced at intervals of 3281 (1000m), extending to a height of 1056ft (322m) and with a rotor diameter of 869ft (265m) permitting unrestricted access operations in all flying conditions day and night which had been theoretically determined prior to the simulator trials as 2.8nm.
  - b. flight crew workload when flying the various profiles identified in the body of this report.

## 3 METHODOLOGY

- 3.1 A total of twelve flight profiles were flown which included departures to and from the platform under day and night Visual and Instrument Meteorological Conditions (VMC/IMC) with all engines operating and with simulated engine and system malfunctions.
- 3.2 For flights involving engine failures the climb to 200ft was on 2.5 minute One Engine Inoperative (OEI) Power with the climb from 200 ft to 1000ft on maximum continuous OEI power.
- 3.3 Simulated emergencies were carried out in accordance with Standard Operating Procedures (SOPs)

Hornsea Three Project: AW139 Flight Simulator Evaluation

- 3.4 The flight evaluations were carried out using a fully certified AW139 Level D Full Motion flight simulator, with EPIC Phase 7 software update.
- 3.5 The maximum permitted mass for the AW139 was 7000kg. For the purpose of the exercise the aircraft all up mass was set at 6800kg, with frozen fuel state.
- 3.6 The flight crew consisted of Chris Schlepers (TRI/TRE AW139) and Jacob Bart (Test pilot, technical pilot AW139) with Henk van Erkelens (pilot -observer)
- 3.7 The Bedford Workload Rating Scale (Appendix 1) was used to determine the pilot workload.
- 3.8 Two separate two hour sessions were flown.
- 3.9 Helideck height 104ft at a range of 1.4nm (this distance arose from using the actual coordinates of the Chiswick platform and the windfarm array. Never-the-less the trials considered the actual minimum separation that would be required)
- 3.10 The platform (Chiswick) and Hornsea Three wind farm array proposed boundary were plotted into the simulator. As the exact positions of the wind turbines is not known, the wind turbines were plotted in rows with the turbines 1000m apart. While the platform and wind turbines were clearly visible to the pilots, they did not show up on the weather radar as they were not hard coded. As a fallback a platform and windfarm array offshore Norwich which was hard coded in the simulator was available and used during session 2. The field line was oriented 135<sup>0</sup>-315<sup>0</sup> and the platform was at a distance of 1.6nm.

Note <sup>1</sup>. The recorded data could not be retrieved after the simulator session and is pending investigation by the simulator technicians.

#### 4 FLIGHT TEST EVALUATIONS (Session 1 – no radar returns)

4.1 Flight test evaluation session 1 was dedicated to the engine failures, engine fire, autopilot failure and VMC approaches at night under day and night. Conditions used were day and night VMC. All distances were taken from the Flight Management System (FMS).

##### 4.2 Flight Test Evaluation 1

<b>Exercise: Airborne Radar Approach to Oil and Gas Platform Without Obstructions</b>	
<b>Simulator Set Up:</b>	
<ul style="list-style-type: none"> <li>- AW139 positioned at 1500ft and 10nm from an unobstructed offshore platform</li> <li>- Wind 10 knots on the nose (W/V 190/10)</li> <li>- Visibility 1800m, Overcast cloud layer at 250ft</li> <li>- OAT 25°C, QNH 1013</li> <li>- Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>	
<b>Objective:</b>	
<ol style="list-style-type: none"> <li>1. To carry out an ARA to a landing on the platform</li> <li>2. To record the workload for the complete procedure</li> </ol>	
Recorded Work Load: 3	
<b>Evaluation:</b> Standard Operating Procedure	
Remarks:	
<ul style="list-style-type: none"> <li>- Not representative of the proximity of the windfarm to the platform as the ARA was flown almost parallel with the wind farm array boundary.</li> </ul>	

##### 4.3 Flight Test Evaluation 2

<b>Exercise: Take-Off from Oil and Gas Platform without Obstructions with Engine Failure at TDP</b>	
<b>Simulator Set Up:</b>	
<ul style="list-style-type: none"> <li>- AW139 positioned on the helideck</li> <li>- W/V 190 /10</li> <li>- Visibility 1000m</li> <li>- Overcast cloud layer 250ft</li> <li>- OAT 25°C, QNH 1013</li> <li>- Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>	
<b>Objective:</b>	
<ol style="list-style-type: none"> <li>1. To carry out a standard category A offshore take-off with a TDP of 20 feet and rotation point of 30 feet from the offshore platform. At TDP fail one engine and continue the take-off as per RFM.</li> <li>2. To record: <ol style="list-style-type: none"> <li>a. drop down below the take-off surface</li> <li>b. distance required to attain VTOSS</li> <li>c. distance required to attain VY</li> <li>d. distance required to attain 500 feet</li> <li>e. distance required to attain 1000 feet.</li> </ol> </li> <li>3. To record WL for the procedure until the end of path 2 (1000 feet)</li> </ol>	
Remarks: Take-off from the helideck in direction of 190°	
<b>Procedure:</b> Standard Operating Procedure	
Drop down below Helideck level:	Awaiting interpretation of simulator data
Distance to VTOSS:	Awaiting interpretation of simulator data



## Hornsea Three Project: AW139 Flight Simulator Evaluation

Distance to VY:	Awaiting interpretation of simulator data
Distance to 500 feet:	Awaiting interpretation of simulator data
Distance to 1000 feet:	1.35 nm. read from the FMS
Recorded Work Load:	3
<b>Evaluation:</b> Standard Operating Procedure	
Remarks: Not representative of the proximity of the windfarm to the platform as the take-off was flown almost parallel with the wind farm array boundary.	

## 4.4 Flight Test Evaluation 3

<b>Exercise: Airborne Radar Approach to Oil and Gas Platform with Obstructions</b>
<b>Simulator Set Up:</b> <ul style="list-style-type: none"> <li>- AW139 Helicopter positioned at 1500ft at 10 nm from an obstructed offshore platform</li> <li>- W/V 215/10 (from the windfarm)</li> <li>- Visibility 1000 m, Overcast cloud layer at 250ft</li> <li>- OAT 25°C, QNH 1013</li> <li>- Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>
<b>Objective:</b> <ol style="list-style-type: none"> <li>1. To carry out an ARA to a landing on the platform</li> <li>2. To record the workload for the complete procedure</li> </ol>
Recorded Work Load: 3
<b>Evaluation:</b> Standard Operating Procedure
<b>Remarks:</b> Platform set up as a waypoint to facilitate the ARA

## 4.5 Flight Test Evaluation 4

<b>Exercise: Take-Off from Oil and Gas Platform with Obstructions at 1.4nm and Engine Failure at TDP</b>
<b>Simulator Set Up:</b> <ul style="list-style-type: none"> <li>- AW139 positioned on the helideck</li> <li>- W/V 260/10</li> <li>- Visibility CAVOK</li> <li>- OAT 25°C, QNH 1013</li> <li>- Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>
<b>Objective:</b> <ol style="list-style-type: none"> <li>1. To carry out a standard category A offshore take-off with a TDP of 20 feet and rotation point of 30 feet from the offshore platform. At TDP fail one engine and continue the take-off as per RFM.</li> <li>2. To record: <ol style="list-style-type: none"> <li>a. drop down below the take-off surface</li> <li>b. distance required to attain VTOSS</li> <li>c. distance required to attain VY</li> <li>d. distance required to attain 500 feet</li> <li>e. distance required to attain 1000 feet.</li> </ol> </li> <li>3. To record WL for the procedure until the end of path 2 (1000 feet)</li> </ol>

## Hornsea Three Project: AW139 Flight Simulator Evaluation

<b>Remarks:</b> Take-off from the helideck in direction of 260°	
<b>Procedure:</b> Standard Operating Procedure	
Drop down below Helideck level:	Awaiting interpretation of simulator data
Distance to VTOSS:	Awaiting interpretation of simulator data
Distance to VY:	Awaiting interpretation of simulator data
Distance to 500 feet:	Awaiting interpretation of simulator data
Distance to 1000 feet:	1.35 nm. read from the FMS
Recorded Work Load:	3
<b>Evaluation:</b> The distance as calculated to climb to 1000ft ASL following an engine failure after TDP using the approved AW139 RFM appeared to be accurate (1.43 nm).	
The distance taken up in the simulator to climb to 1000ft ASL following an engine failure after TDP was approximately 1.35 nm.	
<b>Remarks:</b> This procedure brought the aircraft very close to the turbines and <b>even in VMC felt uncomfortable.</b>	
<b>A turn away from the turbines was not carried out on reaching 1000ft AMSL.</b>	

## 4.6 Flight Test Evaluation 5

<b>Exercise requested:</b> <b>Take-Off from Oil and Gas Platform with Obstructions at 1.4nm with Engine Failure at TDP and Positive indications of Fire</b>	
<b>Exercise carried out:</b> <b>Take-Off from Oil and Gas Platform with Obstructions with Engine Fire Warning shortly after TDP</b>	
<b>Simulator Set Up:</b> <ul style="list-style-type: none"> <li>- AW139 positioned on the helideck</li> <li>- W/V 260/10</li> <li>- Visibility CAVOK</li> <li>- OAT 25°C, QNH 1013</li> <li>- Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>	
<b>Objective to:</b> <ol style="list-style-type: none"> <li>1. Carry out a standard category A offshore take-off with a TDP of 20 feet and rotation point of 30 feet from the offshore platform. At TDP fail one engine and continue the take-off as per RFM, during the drop down segment to include an engine bay fire warning with positive signs of fire. First bottle discharged, fire warning remains illuminated – second bottle discharge – engine bay fire extinguished.</li> <li>2. Record the workload during the procedure and the closest distance to the windfarm boundary.</li> </ol> <p><b>Note: Objectives were not met.</b></p>	
<b>Remarks:</b> The exercise carried out was in reversed sequence. Handling pilot turned onto a heading of 010 at 200 ft. whilst visual as there was no cloud base.	
<b>Procedure:</b> Engine bay fire procedure followed but the exercise was not delivered as intended.	
Recorded Work Load:	Not assessed
<b>Evaluation:</b> N/A	

4.7 Flight Test Evaluation 6

<p><b>Exercise: Night Visual Approach to Oil and Gas Platform with Obstructions at 1.4nm</b></p> <p><b>Simulator Set Up:</b></p> <ul style="list-style-type: none"> <li>- AW139 positioned beginning of downwind at 500 feet</li> <li>- W/V 080/10</li> <li>- Visibility 5000 m, OVC cloud layer at 1200 feet</li> <li>- OAT 25°C, QNH 1013</li> <li>- Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>
<p><b>Objective to:</b></p> <ol style="list-style-type: none"> <li>1. Perform a night visual approach to the platform: turn to a 2 nm final, then descend to 300 feet on RHT. At 1 nm reduce airspeed to end up at 50 knots GS at 0.5 nm. Continue coupled to approximately 0.3 nm, then decouple and manually execute the landing.</li> <li>2. Record the lateral profile (furthest distance from platform).</li> </ol>
<p>Recorded Work Load: Not recorded</p>
<p><b>Evaluation:</b> NON Standard Operating Procedure. Operators normally prohibit flights into windfarm at night.</p>
<p>Remarks:</p> <ul style="list-style-type: none"> <li>- A downwind approach was flown with the intention to set up a 2 nm final to the platform, from where the stabilised descent was to begin for landing. However, this required the aircraft to enter the windfarm for a considerable distance (maximum distance to the platform 2.3 nm, measured from the apex), which was felt as uncomfortable by the flight crew.</li> <li>- An alternative procedure was trialled, where the helicopter was descended to 300 feet AGL on downwind and a turn from downwind to base was started at 1.0 nm distance from the platform. With this procedure the aircraft ended up approximately 1.3 nm from the platform (0.1 nm from the turbines) where speed was reduced for landing. A stronger easterly wind could force the aircraft into the windfarm which is unacceptable.</li> </ul> <p><b>Note:</b> Some operators require at least 0.5 nm (900 m) separation with obstacles in night VMC during all phases of flight (obstacle accountability).</p>

4.8 Flight Test Evaluation 7

<p><b>Exercise: Night Take-Off from Oil and Gas Platform with Obstructions at 1.4nm and Dual Autopilot Failure</b></p> <p><b>Simulator Set Up:</b></p> <ul style="list-style-type: none"> <li>- AW139 positioned on the helideck</li> <li>- W/V 260/10</li> <li>- Visibility 5000 m, OVC cloud layer at 1200 feet</li> <li>- OAT 25°C, QNH 1013</li> <li>- Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>
<p><b>Objective to:</b></p> <ol style="list-style-type: none"> <li>1. Perform a normal offshore take-off, TDP 20 feet, rotation point 30 feet and fail both autopilots on rotation.</li> </ol>

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<ul style="list-style-type: none"> <li>2. Record the lateral profile (shortest distance to windfarm) and any remarks.</li> <li>3. Record WL for the procedure until the end of path 2 (1000 feet)</li> </ul>
<b>Remarks:</b> Take-off from the helideck in direction of 260°
<b>Procedure:</b> Standard Operating Procedure
Recorded Work Load: 3
<b>Evaluation:</b> <ul style="list-style-type: none"> <li>- Night VMC take-off in the direction of the wind farm</li> <li>- Both autopilots were failed just after rotation</li> <li>- Autopilots were selected ON approximately 1 minute after the failure which resulted in the aircraft becoming stable again at 0.5 nm from the platform (1.1 nm from the wind farm).</li> </ul>
<b>Remarks:</b> The interval between the autopilot(s) failure and subsequent ON selection was considered as not realistic as in actual conditions this would be carried out without delay. The 1 minute delay served to assess the controllability of the aircraft which was not considered an issue.

5 FLIGHT TEST EVALUATIONS (Session 2 – with radar returns)

5.1 Flight test evaluation 2 was carried out with full radar returns based on a platform and windfarm array offshore Norwich. The windfarm boundary line was oriented 135°-315° with the platform at a distance of 1.6nm. The take-off headings were adjusted by up to 10° from right angles to the wind farm boundary.

5.2 Flight Test Evaluation 8

<b>Exercise: Airborne Radar Approach to oil and gas platform with obstructions – GO AROUND</b>
<b>Simulator Set Up:</b> <ul style="list-style-type: none"> <li>- AW139 positioned at 1500ft and 10nm from an unobstructed offshore platform</li> <li>- W/V 215/10</li> <li>- Visibility 500 m, Overcast cloud layer at 150 feet (to force a go around at the MAP)</li> <li>- OAT 25°C, QNH 1013Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>
<b>Objective:</b> <ol style="list-style-type: none"> <li>1. To perform an ARA to a go-around</li> <li>2. To record the work load for the complete procedure.</li> </ol>
<b>Procedure:</b> Standard Operating Procedure
Recorded Work Load: 3
<b>Remarks:</b> <ul style="list-style-type: none"> <li>- A standard ARA as per SOPs was carried out inbound towards the windfarm (Direction 215°), followed by a Go-Around due to no visual contact with the platform at the MAP</li> <li>- The go-around was initiated by turning 30° further left and then selecting ALTA to climb to the MSA of 2100 feet. MSA was reached at approximately 0.9 nm from the wind farm. <b>Flying towards a massive field of radar return in the missed approach path was experienced as awkward.</b></li> <li>- An ARA with or without go-around with AEO was deemed possible.</li> </ul>

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## 5.3 Flight Test Evaluation 9

<b>Exercise: Straight in Airborne Radar Approach to oil and gas platform with obstructions at 1.6nm.</b>
<b>Simulator Set Up:</b> <ul style="list-style-type: none"> <li>- AW139 positioned at 1500 feet at 10 nm from an obstructed offshore platform</li> <li>- W/V 215/10</li> <li>- Visibility 1nm, Overcast cloud layer at 250 feet</li> <li>- OAT 25°C, QNH 1013</li> <li>- Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>
<b>Objective to:</b> <ol style="list-style-type: none"> <li>1. Carry out a straight-in ARA to a landing on the platform.</li> <li>2. Record the work load for the complete procedure.</li> </ol>
<b>Procedure:</b> Standard Operating Procedure
Recorded Work Load: 3
<b>Remarks:</b> <ul style="list-style-type: none"> <li>- The aircraft was flown directly into wind with the ARA carried out in the unobstructed sector.</li> <li>- A standard ARA as per SOPs inbound towards the windfarm (direction 215°)</li> <li>- An ARA with or without go-around with All Engines Operating (AEO) was deemed possible.</li> </ul>

## 5.4 Flight Test Evaluation 10

<b>Exercise: Airborne Radar Approach to oil and gas platform with obstructions at 1.6nm.</b>
<b>Simulator Set Up:</b> <ul style="list-style-type: none"> <li>- AW139 positioned at 1500 feet at 10 nm from an obstructed offshore platform</li> <li>- W/V 035/10</li> <li>- Visibility 1nm, Overcast cloud layer at 250 feet</li> <li>- OAT 25°C, QNH 1013</li> <li>- Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>
<b>Objective to:</b> <ol style="list-style-type: none"> <li>1. Carry out an ARA to a landing on the platform.</li> <li>2. Record the work load for the complete procedure.</li> </ol>
<b>Procedure:</b> Standard Operating Procedure
Recorded Work Load: 3
<b>Remarks:</b> <ul style="list-style-type: none"> <li>- The ARA was carried out with the crew selecting a final track of 135°. This resulted in a wind correction angle of 5°, well within limits. The offset was selected to the left, to steer away from the wind farm. As the destination platform became visual, the Pilot Flying steered towards the platform, as per normal procedure (steer OIP away from platform and when visual turn towards the platform). However, this caused the helicopter to fly towards the platform with a tailwind component (which was realised later in the approach). <b>Following such a procedure will cause the helicopter to quickly approach the wind farm in a tail wind condition!</b></li> </ul>

## 5.5 Flight Test Evaluation 11

<b>Exercise: Airborne Radar Approach to oil and gas platform with obstructions at 1.6nm.</b>
<b>Simulator Set Up:</b> <ul style="list-style-type: none"> <li>- AW139 positioned at 1500 feet at 10 nm from an obstructed offshore platform</li> <li>- W/V 035/50</li> <li>- Visibility 1nm, Overcast cloud layer at 350 feet</li> <li>- OAT 25°C, QNH 1013</li> <li>- Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>
<b>Objective to:</b> <ol style="list-style-type: none"> <li>1. Carry out an ARA to a landing on the platform.</li> <li>2. Record the work load for the complete procedure.</li> </ol>
<b>Procedure: NON Standard Operating Procedure</b>
Recorded Work Load: 3
<b>Remarks:</b> <ul style="list-style-type: none"> <li>- Daytime</li> <li>- With the wind increased to 50 knots, the flight crew evaluated a possible way into the windfarm. Using a 90° angle on the wind was no longer possible due to the high cross wind and resulting wind correction angle, an ARA was not possible.</li> <li>- The crew elected to fly towards the corner of the wind farm and circle to land from there.</li> <li>- The final approach track was 060°. As the base of a Wind Turbine Generator (WTG) became visual, the crew flew from WTG to WTG, taking care to correct for the wind blowing the aircraft towards the wind farm as it was turned towards a left hand base.</li> <li>- From the windfarm the Flight Management System was used to steer to the platform (which was not visible as the crew tried to remain visual with the individual WTGs).</li> <li>- The platform became visual at 1 nm distance.</li> <li>- Overall the manoeuvre was experienced as very uncomfortable and definitely not recommended in the weather conditions used (350 feet cloudbase and 1 nm visibility). Significantly higher visibility and cloud base limitation would be required in order to safely execute this procedure.</li> </ul>

## 5.6 Flight Test Evaluation 12

<b>Exercise: ARA to circling approach to oil and gas platform with obstructions at 1.6nm – Inadvertent entry into IMC during circling with obstructions.</b>
<b>Simulator Set Up:</b> <ul style="list-style-type: none"> <li>- AW139 positioned at 1500 feet at 10 nm from an obstructed offshore platform</li> <li>- W/V 035/20</li> <li>- Visibility 2000m, Overcast cloud layer at 350 feet</li> <li>- OAT 25°C, QNH 1013</li> <li>- Parking brake ON and floats ARMED</li> <li>- Simulator recording ON</li> </ul>
<b>Objective to:</b> <ol style="list-style-type: none"> <li>1. Perform an ARA with a circling to land</li> <li>2. During the circling procedure reduce the cloud base to overcast at 100ft.</li> <li>3. Inadvertent entry onto IMC and execute a go-around (missed approach)</li> </ol>

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4. Record the work load for the complete procedure and closest distance to the windfarm.
<b>Procedure:</b> Standard Operating Procedure
Recorded <b>Work Load:</b> 8
<p><b>Remarks:</b></p> <ul style="list-style-type: none"> <li>- Daytime</li> <li>- The flight was conducted to evaluate an ARA with a tailwind leading to a circling approach with tailwind until positioned back into wind to set up a stabilised approach to land.</li> <li>- The final approach was flown at 65kts Indicated Airspeed to maintain approximately 90kts groundspeed.</li> <li>- Platform became visual at the downwind MAP.</li> <li>- With the weather worsening on the downwind leg of the visual circling manoeuvre contact with the platform was lost as the aircraft inadvertently entered IMC.</li> <li>- As the aircraft entered IMC, the go around mode was selected to start a climb, followed by the selection of HDG mode to steer away from the wind array. However, the wind pushed the aircraft very close to the WTGs and the crew was fully occupied with steering away and climbing as fast as possible. Closest point to the wind farm was approximately 0.5 nm in IMC at 700 feet. Workload was assessed as very high with almost no spare capacity. Difficulty in maintaining level of effort.</li> </ul> <p><b>Note: if inadvertent entry into IMC had occurred further along the downwind leg of the visual circling manoeuvre the aircraft would have approach closer to the wind turbine. Moreover, the workload on the pilots would further increase in the event of an engine or aircraft system malfunction coinciding at this point.</b></p>

## 6 CONCLUSION

- 6.1 Overall, flying ARAs to a platform so close to a wind farm as presented is considered very challenging.
- 6.2 The results of the simulator trials do not take into consideration any increased response time for the flight crew to recognise, analyse and react to aircraft system malfunctions.
- 6.3 To ensure continued safe commercial air transport operations the distance between the platform and the windfarm boundary needs to be increased and a safety margin added, creating more space for safe approaches and departures. A minimum safe distance to accommodate approach and departures is considered to be not less than 3.3nm.
- 6.4 Implementing higher weather minima to allow the flight crew to remain visual with both the WTGs and the platform as an alternative would have a significant negative impact on access to the facility and on the applicable safety case.

7 Appendix 1 – Bedford Workload Rating Scale

