

From: [Victoria Lane \(Brodies Solicitors\)](#)
To: [Hornsea Project Three](#)
Cc: [Karen Hamilton \(Brodies Solicitors\)](#)
Subject: Spirit Energy - Deadline 9 Submission [BRO-D.FID4510105]
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Attachments: [image013.png](#)
[image014.png](#)
[image015.png](#)
[image016.png](#)
[image017.png](#)
[image018.png](#)
[Appendix 2 - GCA.Final Report 25 March 2019_45309744_1.PDF](#)
[Deadline 9 Submission Document - 26 March 2019_45310148_1.PDF](#)
[Appendix 1 - Sworn Statement by Rune Boge_45280779_1.PDF](#)
[Appendix 3 - Spirit Energy Note on Impact of Matters Not Agreed_45310113_1.PDF](#)
[Appendix 4 - Areas of Agreement on J6A Data Set Analysis_45310073_1.PDF](#)
[Appendix 5 - Markham Treaty \(UK version\) dated 26 May 1992_45297145_1.PDF](#)
[Appendix 6 - Sworn Statutory Declaration_45286594_1.PDF](#)

CONFIDENTIAL MESSAGE - INTENDED RECIPIENT ONLY

Dear Sirs,

Please find attached a submission document and accompanying appendices comprising the Deadline 9 Submission on behalf of Spirit Energy.

Kind regards,

Victoria

Victoria Lane
Senior Solicitor
Edinburgh, UK
www.brodies.com

Direct Line +44(0) 131 656 0127



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Impact of matters not agreed between Applicant and Spirit Energy

1. ALARP

- 1.1 Matter not agreed: Spirit Energy submit that the Applicant is required to demonstrate that the risk to personnel supporting Spirit Energy's operations will remain ALARP.
- 1.2 A small increase in risk to personnel will arise as a result of -
 - (a) Personnel spending more time on NUI's than they would have done had windfarm array not been present
 - (b) Greater risk of vessel collision as a result of the presence of the windfarm
 - (c) Greater risk of vessel collision as a result of windfarm construction traffic – especially larger vessels
- 1.3 Increased non-availability of flights (see 2 below) increases the risk of personnel spending longer on NUI's. Absent an ALARP assessment undertaken by the Applicant, *Spirit Energy calculate that ALARP would be achieved if no turbines are placed within 6nm of the NUIs.*
- 1.4 Spirit Energy are of the view that collision risk will be increased by some ships electing to pass to the east of the array under some weather conditions. The risk to personnel on the NUI's may be mitigated by early warning from radar / AIS, a matter on which Spirit Energy and the Applicant are now agreed but it is likely that there would still be an increased risk. *Spirit Energy believe that provision of a 2nm corridor between the array and its permanent platforms would further mitigate this risk to maintain current ALARP levels.*
- 1.5 Impact upon Spirit Energy: Should the ExA decide that risk to personnel is not required to remain at current ALARP levels, each of the platform safety cases will need to be revised with a full quantitative re-analysis of risks. The cost of this would be of order £500k per platform and the costs of any additional mitigation measures are unknown.

2. Impact of array proximity on operations (aviation)

- 2.1 Matter not agreed: Space requirements around each of Chiswick and Grove platforms and subsea wells C6, C7, G5 and Kew
- 2.2 Following extensive consultation, including discussion with helicopter operators, a set of minimum distances for take-off and landings under different conditions have been calculated (Spirit Energy Deadline 7 Submission, Appendix 4). The basis of the calculations is agreed between the Applicant and Spirit Energy. These distances have yet to be accepted by helicopter operators who have already indicated that they may add some safety margins. Simulator flights are being arranged with the helicopter operators to facilitate their making a full assessment.
- 2.3 The Applicant and Spirit Energy have independently undertaken analyses of the same met-ocean dataset and have arrived at broadly similar results that show that the impact upon Spirit Energy's operations is critically dependent upon the distance of the array from Spirit Energy's facilities. Using the minimum distances (i.e. those calculated but now subject to validation in simulator trials and acceptance by helicopter operators), the impact may be

summarised below¹. The table shows, that with no windfarm, flights are possible 97% of the time. With the windfarm in proximity, the proportion of days upon which flights can be conducted is reduced. The fourth column expresses this reduction as a percentage of flights that would otherwise have been available were there no windfarm. In the fifth column, this percentage is converted into the number of days per year (that would otherwise have been available) on which it would not be possible to fly a crew to a NUI and back at the end of their working shift. The sixth column shows the average delay (in days) in being able to fly personnel to a NUI for a working shift. The final column calculates the estimated loss of production revenue arising from delays to flights required to restore production following unplanned shutdowns. The calculation takes into account that in 2017 (regarded as a representative year) there were 66 such unplanned visits to Chiswick. Assuming that the percentage given in the fourth column of these flights would be delayed and using the average delay (based on the met-ocean data) before flights can be resumed (shown in the sixth column), the overall delay is calculated. This is then multiplied by the daily production revenue (taken from Woodmac who are independent industry analysts) to arrive at the lost revenue.

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
3.3	97%	92%	5%	16	1	0.6
3.1	97%	92%	5%	16	1	0.6
2.9	97%	92%	5%	16	1	0.6
2.8	97%	92%	5%	16	1	0.6
2.7	97%	74%	23%	78	1	4.5
2.5	97%	63%	35%	119	2	8.0
2.3	97%	47%	51%	172	2	16.9
2.1	97%	35%	63%	214	3	28.5
1.9	97%	35%	63%	214	3	28.5
1.7	97%	23%	76%	257	5	54.4
1.5	97%	19%	80%	271	6	67.4

<= Distance to Chiswick now proposed by Ørsted in their protective provisions

<= Distance to Chiswick and to Grove G5

¹ Minor modifications since the Deadline 7 submission have been made to the calculations following further discussion between the Applicant and Spirit Energy on 20th March.

1	97%	11%	89%	300	10	124.8

proposed in DCO

<= Distance to C6, C7 now proposed by Ørsted in their protective provisions

- 2.4 It can be seen that, setting aside consideration of ALARP (see 1 above), there is a rapid change in impact as the distance exceeds the minimum distance required for take-off (calculated to be 2.81nm). In this table, the losses resulting from the array being no less than 2.8nm from any installation to which helicopters need to fly may be considered to be reasonable in the spirit of coexistence. Conversely, the level of disruption (e.g. >25% of flights being unavailable) with less separation between any vessel or installation that requires helicopter access would not be reasonable and at a distance of 1.5nm as originally proposed by the Applicant, losing 80% of flights would be quite unmanageable. It should be noted that should the helicopter operators add any additional safety margin to the minimum distances calculated then a corresponding increase would be required in separation between installations and the windfarm array in order to achieve successful coexistence.
- 2.5 During construction, decommissioning and whilst drilling or performing well interventions (at the NUIs or at subsea well locations), the vessels used require to be accessible by helicopter as there is generally a need for frequent changes in personnel (as different skills and specialisms are required).
- 2.6 Impact upon Spirit Energy: If the array were permitted to be *at less than the distances helicopter operators determine is required to execute the majority of take-off and landing manoeuvres* (assumed in this analysis to be 2.8 nm but some operators have already signalled a need for greater space) from offshore installations and vessels, Spirit Energy would effectively be unable to rely upon helicopter support for its operations. As illustrated in the table above, this is likely to make production from the existing NUIs unviable. As frequent movement of equipment and personnel is required during drilling, construction and decommissioning activities (e.g. the current drilling activity at Chiswick is serviced by two flights per day to the rig – typically between 50 – 100 personnel will man a drilling rig) essential operations at the subsea installations would also not be viable.

3. Impact of array proximity on operations (shipping)

- 3.1 Matter not agreed: Space requirements for 3rd party and Spirit Energy vessels around each of Chiswick and Grove platforms and subsea wells C6, C7, G5 and Kew.
- 3.2 Masters of third party vessels may, under certain wind conditions, elect to pass to the east of the array. Evidence to the contrary presented by the Applicant has been shown to be the direct result of input assumptions. In order to ensure safe passage for such vessels and minimise collision risk, a 2nm wide PIANC compliant corridor can be created by the eastern edge of the array being no less than 2nm to the west of a line through the Chiswick and Grove platforms. This would require only a small reduction in the array area to the south of Chiswick but would provide very significant operational and safety benefits by allowing vessels to pass on a constant heading and at a safe distance from Spirit Energy's installations rather than having to divert around Chiswick.
- 3.3 For vessels servicing Spirit Energy's platforms and subsea infrastructure, having at least 2nm to the array would also ensure adequate sea room to place anchors and/or adopt appropriate stand-off positions.

- 3.4 Impact upon Spirit Energy: If there were no corridor, a significant number of false alarms from the AIS and radar early warning system would be expected as third party vessels approach Chiswick on a heading towards the platform before making a diversion to the east to circumnavigate it. Such repeated false alarms would lead to considerable disruption to personnel working on the facility, interfering with and extending the time taken to undertake essential work (including restoring production) with a consequent loss of production revenue and increase in costs. The increased time personnel would spend on the installation would also increase risk to personnel as set out in section 1 above. Spirit Energy's experience in the East Irish Sea was that, following construction of the Walney Extension windfarm, there were frequent alarms warning of potential vessel allision which were highly disruptive. In that case the vessels heading for the platform were regular ferries and it has been possible to modify the early warning system to only raise an alarm for vessels heading for one of the platforms when these are either unknown vessels or known vessels that deviate from their expected courses. In the case of Hornsea Project Three, most vessels passing to the east of the windfarm would be unknown third party vessels so such a solution would not mitigate the impact.
- 3.5 In addition to false alarms, the actual risk of allision is considered by Spirit Energy to increase. Vessel data recently gathered shows that assumptions on vessel routing made by the Applicant in their risk assessment are incorrect and, whilst the volume of traffic may not be great, the consequences of such allision would be significant in terms of potential loss of life and major damage.
- 3.6 If there were not 2nm searoom around each installation, vessels working at or on Spirit Energy infrastructure would face restrictions, particularly in terms of appropriate weather windows in which they could carry out operations. This would significantly add to the cost of these already expensive operations. The kind of vessels utilised typically cost in the range of \$50,000-\$200,000 per day to lease and there are additional costs for personnel and support vessels.

4. C6 and C7

- 4.1 Matter not agreed: The proposed C6 and C7 subsea wells are integral to maximising economic recovery from the Chiswick Field and each of these wells need to be afforded the same space as for a NUI
- 4.2 Documents submitted by Spirit Energy at this Deadline 9 (Appendices 1 and 2) confirm that these wells have been under consideration, and discussed with the regulator OGA, since (in the case of C6) 2014 and (in the case of C7) 2015. Both wells have met the strict criteria to be categorised as Contingent Resource as defined by the Society of Petroleum Engineers' Petroleum Resource Management System. The nature of contingent resource is that some further work is required before considering the resource as proven reserves. In the case of these wells, this would be analysis of the production from the C5 well and then (for C7) from the C6 well. Spirit Energy accepts that it would be reasonable for the protections discussed in sections 2 and 3 above to be contingent upon Spirit Energy meeting milestones in the more detailed planning and execution of these wells.
- 4.3 Spirit Energy acknowledges that the Applicant has proposed some accommodation for these wells in their latest proposed protective provisions but, as outlined in sections 2 and 3 above, the proposed 1nm zone around these wells is inadequate for both vessels and helicopter access to any rig or vessel working on the well (which as a minimum will be required during drilling, during any subsequent workovers which may typically occur approximately every

three years of the well's life, and during decommissioning). Accordingly, the Applicant's proposed protective provisions would not be effective.

- 4.4 Impact upon Spirit Energy: Were C6 and C7 not given the space required for vessel and helicopter access, Hornsea Project Three is likely to prevent the maximisation of economic recovery from Chiswick with the Chiswick field being decommissioned earlier than its true economic end of life.

5. Grove

- 5.1 Matter not agreed: Timescale for cessation of production and decommissioning of Grove

5.2 Although the Grove field is nearer to the end of its economic life than Chiswick, there remain opportunities for life extension, including at least one additional well to be drilled from the platform and a planned workover of G5 (requiring a rig over the subsea well location) and Spirit Energy would not be permitted by the OGA (from whom consent to permanently cease production has to be obtained) to cease production until it has demonstrated that such opportunities have been exhausted. Accordingly, Spirit Energy is unable to commit to any date for the removal of the Grove facilities (the NUI and subsea well G5). Never-the-less, in the spirit of coexistence Spirit Energy believes that by maintaining good communication between Spirit Energy and the Applicant and by each party exercising such flexibility as they have at their disposal (e.g. in the case of the Applicant, a phased development of Hornsea Project Three and, in the case of Spirit Energy, piecemeal decommissioning – particularly of the subsea G5 well rather than waiting to undertake this more efficiently as part of a decommissioning campaign), there should be scope to allow the space around Grove to transition from use in oil and gas exploitation to use in offshore electricity generation without too much inconvenience to either party. It should be noted that as the Grove NUI is 2.4nm from the eastern edge of the array area, there would be limited impact on the array layout of the space requirements set out in section 2 above.

- 5.3 Impact upon Spirit Energy: Were the Grove NUI and G5 not each given the space required for vessel and helicopter access, Hornsea Project Three is likely to prevent the maximisation of economic recovery from the Grove field with it being decommissioned earlier than its true economic end of life.

6. G5

- 6.1 Matter not agreed: The Grove G5 subsea well needs to be afforded the same space as a NUI and subsea wells C6 and C7.

6.2 As set out in sections 2, 3, and 4 above, in order to permit both vessels and helicopter access to any rig or vessel working on the well (which as a minimum will be required during drilling, during any subsequent workovers which may typically occur approximately every three years of the well's life, and during decommissioning) the same space will be required as for a NUI.

- 6.3 Impact upon Spirit Energy: Were G5 not given the space required for vessel and helicopter access, Hornsea Project Three would prevent the maximisation of economic recovery from Grove and the field would be decommissioned earlier than its true economic end of life.