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Volume 9

The Applicant's Response to Spirit Energy's Deadline 5 Submission Appendix A: Review of ORS Safety Report

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MORECAMBE OFFSHORE WINDFARM

Review of ORS Report

Morecambe Offshore Windfarm Limited

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Review of the ORS report on the of safety impact of the proposed Morecambe Offshore Windfarm on existing oil and gas operations.

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Table of Contents

1	INTRODUCTION.....	1
2	OVERALL REVIEW	2
3	SAFETY CASE ACCEPTANCE	3
4	DETAILED REVIEW	4
4.1	Legislative Impact	4
4.2	The Nine Issues	5
5	REFERENCES.....	11

Acronyms

Acronym	Meaning
ALARP	As Low as is Reasonably Practicable
CA	Competent Authority
CAT	Commercial Air Transport
ERRV	Emergency Response and Rescue Vessel
HSE	Health and Safety Executive
HTAWS	Helicopter Terrain Awareness and Warning System
IMC	Instrument Meteorological Conditions
IRPA	Individual Risk per Annum
MOWL	Morecambe Offshore Windfarm Limited
MOWF	Morecambe Offshore Wind Farm
NUI	Normally Unattended Installation
POB	Persons on Board
REWS	Radar Early Warning System
SAR	Search and Rescue
SECE	Safety and Environmental Critical Element
TR	Temporary Refuge (on an installation)
UKCS	UK Continental Shelf
VMC	Visual Meteorological Conditions
W2W	Walk to work



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1 INTRODUCTION

There is a potential effect to the helicopter operations associated with a number of offshore oil and gas installations situated in close proximity to the Morecambe Offshore Windfarm Project. Helicopter access reports produced by Anatec /1/ and AviateQ /2/ identify that the range of environmental conditions in which helicopter flight operations to nearby oil and gas facilities can be carried out would be reduced due to the wind turbines.

The facilities are operated by Spirit Energy with the permanently manned platform complex CPC-1 being the hub of the operation (CPC-1 comprises CPP-1, AP-1 and DP-1). Work parties fly from CPC-1 to the Normally Unoccupied Installations (NUIs) for up to 12 hours before returning to CPC-1. Flights at CPC-1 and the NUIs Calder and DP-6 are potentially affected by the Project. Flights to DP-8 and DPPA are potentially affected as personnel travel there via CPC-1. These facilities are collectively termed the 'affected assets' for this purpose of this report, following the terminology used by Spirit Energy in their representations.

Specifically, the effect of the wind turbines is that the availability of Commercial Air Transport (CAT) helicopters to access these installations could be restricted to daytime Visual Meteorological Conditions (VMC) due to the obstacle clearance needed at night or in bad weather being impinged on by the windfarm and specifically, the high turbine blades (~300m above sea level).

For Deadline 5, DNV submitted an update analysis (Revision 2) of the safety implications of the above /3/ and also at deadline 5, Spirit submitted a report by ORS that assessed the same and contains significant comment on DNV's /3/ report (albeit at Revision 1) subject. This report is a critical review of the report from ORS /4/, whom:

have been tasked by Spirit Energy to review the effect of the proposed wind farm layout on safety on the CPC installations; the impact on the CPC safety case, legislative compliance, and requirements for future safety case submissions.

The report is structured with 9 tables each covering a different issue making up Appendix A. Section 1 is an introduction. Section 2 is essentially a summary of the tables plus a legislative impact analysis. Section 3 and 4 are discussion and conclusions respectively. Section 4 of this report includes a detailed review of the 9 issues, each of which is summarised by ORS in 1 or 3 bullets, and the legislative impact analysis (within this review of ship allision and potential REWS degradation has been provided by Flotation's experts in this area – Nash). However, first in section 2, DNV have summarised the review of the whole report. Section 3 is a commentary on safety case acceptance.

The report also contains a reiteration of DNV consideration of whether the changes brought about by the windfarm are material with respect to the safety case.

ORS reviewed Revision 1 of DNV's report. It was updated at Deadline 5 to Revision 2 and the DNV response here is in relation to Revisions 2. It is possible that some of the comments from ORS would have changed had they seen revision 2. The changes between Revision 1 and 2 are noted as:

- Updates following client meetings and most recent representations.
- Improved discussion of maintenance impact, emergency response (including examples) and other aspects.
- Includes offshore working time analysis.
- Inclusion of executive summary.

2 OVERALL REVIEW

Overall, the report is simply a reiteration of Spirit's position with no new analysis, or justification of the position. It contains numerous errors and inaccuracies using information selectively such that it can be misleading. The report:

Does not contain analysis or justification

Does not include any analysis but just takes the Spirit assertions as fact. In doing this, it just reflects the Spirit position without adding to it. For example, there is no assessment of any maintenance impact, merely a repeat of Spirit's' claimed position.

Does not understand material change

Information is given in the DNV report on individual risk to counter claims made by Spirit that a few additional flights could make the risk intolerable. ORS incorrectly claim that this is the only criteria considered by DNV. This is contrary to OEUK guidance on material change, which is a guidance document that was first written under the chairmanship of one of the authors of the DNV report. To think that DNV would not understand this guidance, that is also reflected in HSE requirements, or guidance, is absurd.

Does not understand reverse ALARP

Reverse ALARP is attempt to justify the removal of a safety measure that was previously in place – for example, removal of part of the deluge system when no hazards have changed

Does not understand cumulative impacts

A material change is one that changes the basis on which the safety case was accepted. This is likely to be a single change, such as a new subsea tie-back, but could also be a collection of small changes. DNV are not aware of a material change ever being submitted on this basis, but it is not impossible that it has happened. There is no ORS justification of why the impacts of the windfarm on helicopter access are cumulatively material. Just because there may be more than one impact does not necessarily make that material. It is normal for an Operator to make many smaller changes to an installation and not submit a material change to it on cumulative grounds.

3 SAFETY CASE ACCEPTANCE

Should Spirit choose to declare the changes to be material and submit the safety case to the HSE before any new infrastructure for the windfarm is in place, DNV consider that it would be accepted as:

- The CAA, who have jurisdiction when helicopter rotors are turning would be satisfied with the restrictions and there would be no new risk reduction controls in place. This would have included any consideration of wake effects.
- There would be no maintenance impact as the time lost from any cancelled flights could be easily made-up, or other strategies (such as an additional NUI team, Spirit reverting to a resource model that also allowed them to operate DP3 and DP4) would be possible.
- The emergency response strategy of evacuation by CAT opportunistly otherwise relaying on SAR, then lifeboats would be unchanged.
- Any change in risk from additional flights would be minimal.
- Any impacts on REWS will be low and will be manageable without the need for further risk reduction measures. The presence of the proposed windfarm will not affect Spirit's ability to comply with PFEER Regulation 10 and the ship collision risk will not increase.

For safety case acceptance, the issue of cumulative changes is not relevant: this is only a trigger for whether a change is material or not.

ORS also raised the issue of changes to shipping in relatively close proximity to the installations caused by the windfarm's location, but gave no information as to whether this would increase or decrease. Nash has confirmed that the overall ship collision risk drops and there are also no changes in how the ship impact is managed are likely.

ORS also raised the issue of cumulative change, but as none of the issues are significant, nor linked other than being due to the windfarm, this is not considered to be the case. ORS do not provide justification on why they believe it is cumulative.

4 DETAILED REVIEW

In the detailed review, a colour coding is used whereby red indicates that DNV do not agree with the conclusion made by ORS. Amber indicates that there is some truth in the issue identified, but the impact is less than that claimed by ORS. Green shows agreement.

4.1 Legislative Impact

Legislation	ORS Claimed Issue	DNV review
Air Navigation Order 2016	Buffer zones	The quoted buffer zone does not appear in the legislation.
PFEER Reg.5 Assessment	Substantial revision required	This is incorrect. The only change is to the use of civilian helicopters for non-emergency evacuation.
SCR15 Reg. 16 Management and control of major accident hazards	No reason or justification given	There is no change to the management and control of major hazards. No new safety measures are required.
PFEER Reg.10 Detection of incidents	REWS may be affected	No justification is provided in the ORS Report for the assertion that REWS will be impacted. The assessments undertaken for the application state that any impacts on the REWS would be low and will be manageable without the need for further mitigation measures. Therefore, it is not considered credible that the windfarm will impact Spirit Energy's ability to demonstrate compliance with PFEER Reg. 10 for ship collision threats, nor is there any evidence that ship collision risk will increase.
PFEER Reg.15 Arrangements for evacuation	Flight restrictions on the preferred means of evacuation	Helicopters are preferred but not practical for many emergencies. The only change is to the use of civilian helicopters for non-emergency evacuation.
PFEER Reg.19 Suitability and condition of plant SCR Reg. 9 Establishment of verification	Maintenance is claimed to be affected	Maintenance and verification are shown in revision 2 of DNV's report to be not affected with any hours lost by weather restrictions easily made up on other days.
SCR15 Reg.24 Revision of safety case	Claim that the safety case would be materially affected	No justification is provided for this false claim. The impacts are minor.
SCR15 Reg.28 Duty to conform with safety case and notifications of operation	Unclear what ORS are claiming as the need to comply with the safety case is absolute	ORS claim a substantial change in risk without any analysis of any change in risk.

Legislation	ORS Claimed Issue	DNV review
SCR15 Regulation 29 Duty to control risk	That the helicopter trips will <i>significantly increases the risk of a major accident</i>	This regulation is concerned with one-off conditions (maybe following a failure) that require a risk reduction measure to be implemented (including cessation of an activity). It is nothing to do with any change in helicopter operations

4.2 The Nine Issues

ORS Issue	New information or analysis	Analysis of ORS Conclusions
1 – Aviation Buffer Zone	None	<p>1. <i>Renders Spirit Energy unable to access the affected assets by helicopter at night or in weather conditions that reduce visibility (see Issue 2)</i></p> <p>Acknowledged, though the corridor reduces the impact of this and regardless of this, the impact on working time on the NUIs is minimal.</p>
		<p>2. <i>Exposes Spirit to increased risk of regulatory enforcement action</i></p> <p>Incorrect – helicopter flights will only be made in accordance with applicable regulations</p>
		<p>3. <i>Will require a Material Change submission of the Safety Case to the Regulator</i></p> <p>Incorrect – the safety case referred to in CAP764 is an air traffic control safety case.</p>
2 – Aviation Operations	None	<p>1. <i>Requires Spirit Energy to operate with a 1.5nm buffer zone when CAA practices and agreed industry practice will require a 3nm buffer zone.</i></p> <p>Full justification of the 1.5nm zone has been provided by MOWL. No reference is provided for 3nm and DNV are not aware of it appearing in CAA documentation.</p>
		<p>2. <i>Increase the risk associated with helicopter operations and limit pilots' ability to respond to helicopter equipment failures e.g. engine rotor failure at TDP.</i></p> <p>Any risk increase is acceptable as has been shown by MOWL. By analogy, a new roundabout on a road may increase the risk of collision, but as it will be designed to highway norms, this risk is very low and acceptable.</p>
		<p>3. <i>Increase the number of helicopter flights due to aborts, cancellations, and increased constraints,</i></p> <p>Agreed, though this impact has been shown by DNV to be very small.</p>

ORS Issue	New information or analysis	Analysis of ORS Conclusions
		In addition, contrary to claims made by ORS, CAP1721 refers to several situations in which AMCs have been put forward and accepted by the CAA.
3 - Aviation – Turbine Wake	Yes – wake had not previously been considered	1. <i>The wind turbine array will create a region of turbulence and velocity deficit downwind of the windfarm.</i> Agreed
		2. <i>This effect will result in chaotic changes in magnitude and direction of the wind speed components, with the pilot having to respond to these on approach and take-off.</i> For this to be an issue on approach, the helicopter would clearly also be approaching towards the installation, which would create far more local turbulence than a distant turbine. 6 rotor widths is less than a nautical mile meaning the effect is never an issue on this approach – whether visual or instrument. For an approach from the direction of the windfarm e.g. North wind, the wake would be in the South away from the installations. Wake turbulence sinks and does not rise, As helicopters are typically above the maximum height of the windfarm, this will provide adequate mitigation.
		3. <i>Pilot workload will increase significantly and aircraft handling around the affected platforms will become more challenging. The risk associated with Helicopter transport will increase as a result.</i> As above – not an issue. ORS seem to be suggested a quantitative assessment of the risk, which is not possible for any nuance in helicopter operations (Day, night, VMC, IMC), because thankfully the helicopter incident data is too sparse to provide it due to the sheer lack of incidents.
4 - Emergency Evacuation by Helicopter	None	<i>Overall, this assessment concludes that helicopters currently provide a viable and credible means of evacuation from CPC in the event of a major emergency involving the majority of major accident scenarios associated with fire / explosion or ship collision. It is further concluded that the proposed development will significantly compromise this evacuation capability for the affected assets.</i> There are numerous aspects of this that are incorrect including: <ul style="list-style-type: none"> No analysis of the time to evacuate, nor the possibility of using commercial helicopters in an emergency No distinction between NUIs and CPC-1: NUIs are only visited in “good” weather. To claim that the helideck on DP1 may be used is there is a serious process event on the CPP platform between DP1 and the TR is far-fetched. This would require moving people towards (or even through) the hazard that was

ORS Issue	New information or analysis	Analysis of ORS Conclusions
		<p>necessitating evacuation – something which is contrary to all guidance. For such a serious (and highly unlikely) event, the lifeboats would be used.</p> <ul style="list-style-type: none"> To claim that helicopter can be used for a ship collision threat is incorrect for CPC-1 as there would not be time. It is possible for NUIs, but helicopter evacuation is almost always possible for the NUIs as they are only visited in good flying conditions. Spirit does not have 3 helicopters "at its disposal" – it depends on how the 2 not normally being used for Spirit operations are being utilised.
5 - Emergency Evacuation by Lifeboat	None	<p><i>1. Increased dependence on the use of lifeboats for evacuation with a higher risk of injury and fatality during these activities.</i></p> <p>There is no change to emergency evacuation as CAT helicopter cannot be relied on for this. Precautionary evacuation is not an emergency. There is no distinction or thought on this in the ORS report.</p> <p><i>2. Increased dependence on higher risk escape to sea facilities due to the lower availability of helicopters and;</i></p> <p>As above.</p> <p><i>3. Increase in potential vessel impact events due to existing traffic being re-routed to avoid the proposed windfarm and additional vessels to service the development.</i></p> <p>This is unjustified conjecture. Vessels clearly have the ability to avoid both. There will be additional vessels to service the windfarm, but this would also be the case if it was located anywhere vaguely near to the installations.</p>
6 – Marine Traffic	Yes consideration of REWS impact w.r.t safety	<p><i>The proposed development will increase risks to personnel on the affected assets by increasing the likelihood of a ship collision, and by degrading Spirit's ability to detect threats within the affected area and take timely emergency response action.</i></p> <p>There is no analysis provided by ORS that shows whether the likelihood of impact goes up, or down due to the windfarm location and any change in shipping routes. As noted in previous submissions, given Spirit Energy's use of the term 'collision' to reference infrastructure collision, in the context of this response, 'collision' is considered equivalent to 'allision' as referred to throughout the project application documents. Nash state that:</p> <p>The Applicant has demonstrated that the allision risk is reduced in the future case with the project in place. This is due to the displacement of passing vessels further away from Spirits' assets with the project in place. This is highlighted Appendix E of the Applicant's Response to Spirit Energy's Deadline 4 Submission - Revision 01 (Volume 9) (REP5-067), the allision frequency modelling undertaken provided a total (drifting and powered) allision risk probability for each of the oil and gas</p>

ORS Issue	New information or analysis	Analysis of ORS Conclusions
		<p>assets (see Table 1 within Appendix E of the Applicant's Response to Spirit Energy's Deadline 4 Submission - Revision 01 (Volume 9) (REP5-067)) and considered the future case (deviations with Project in place) scenarios. The results show that, while particular assets will see very minor, localised increases in allision risk, the overall allision likelihood decreases rather than increases as a result of the Project.</p> <p>Spirit Energy state that the project 'will displace current shipping traffic' and increase traffic 'in proximity to the affected assets. With regard to deviated traffic, the Applicant has previously outlined in its response to Spirit Energy Deadline 1 submissions (REP2-030) that these shipping route deviations were included within the risk modelling assessment of allision risk undertaken in the NRA (REP3-028) and that the overall risk was assessed as acceptable through the NRA process. While the vessels would take a different route as a result of the Project, the vessel masters would be equally likely to transit in accordance with international regulations (e.g. SOLAS) and therefore maintain an adequate closest point of approach (CPA) to Spirit's infrastructure. The necessary route deviations therefore do not guarantee that commercial vessels will transit in closer proximity to Spirit's infrastructure. The deviated routes are also minor routes, with less than one vessel transiting on them per day.</p> <p>An assessment of the potential impact of the project on REWS was submitted at part of the application and updated to address comments from Spirit Energy at Deadline 3 (REP3-034). The assessment concludes that any impacts on the REWS would be low and will be manageable without the need for further mitigation measures. No justification is provided in the ORS Report. Therefore, it is not considered credible that the windfarm will impact Spirit Energy's ability to demonstrate compliance with PFEER Reg. 10 for ship collision (sic allision) threats.</p> <p>Although there will be additional project vessel movements associated with the project, they will be time-limited to construction/decommissioning and major maintenance periods and will not transit closer to Spirit Energy assets given that passage plans will be developed to ensure deconfliction and minimise impact on other traffic and infrastructure. At this stage of the Project, the details of the project vessel movements are not well defined, Project vessels will navigate in accordance with national and international conventions and, whilst engaged with the project activities, will be subject to the embedded risk controls that will be secured, including the Vessel Traffic Management Plan (REP5-036). Project vessels will also follow Marine Operating Guidelines during construction and operation and maintenance activities to ensure Project vessels do not present unacceptable risks to each other or other nearby vessels or infrastructure.</p> <p>On the point of increased likelihood of collision (sic allision), the allision modelling undertaken within the NRA (REP3-028) considers both a 15% estimated increase in traffic, to account for increases in traffic caused by the Project, and the future</p>

ORS Issue	New information or analysis	Analysis of ORS Conclusions
		case (route deviations with Project in place) scenarios. Within both the NRA (REP3-028) and CRNRA (APP-074), the term “future case scenarios” refers to the future case route deviations that would be caused by the Project, which are illustrated in the right-hand panels of Figure 57 and Figure 55 within the NRA (REP3-028) and the CRNRA (APP-074), respectively. As highlighted above, the overall allision likelihood decreases rather than increases as a result of the Project.
7 - Execution of Maintenance Plan	No	<p><i>The restrictions which will be placed upon Spirit Energy operations as a result of changes to helicopter operations will seriously curtail the ability of Spirit Energy to maintain their plant in a safe condition, and would therefore lead to increased risks to personnel and increased risk of regulatory enforcement action for the organisation.</i></p> <p>This ORS report contains no analysis of maintenance and simply reflects Spirit's incorrect assertions. It is not an independent analysis.</p>
8 - Safety Case - Tolerability of risk	None	<p><i>Overall, the cumulative effect of the increase in risk associated with Fire & Explosions (as a result of poorer SECE condition); Helicopter Operations (as a result of pilot workload and increase reliance on lifeboats); and Ship Collision (as a result of marine traffic diversions around the affected assets) means that a Material Change to the Safety Case is required.</i></p> <p>There is no justification of the above statement. SECEs will not be adversely affected by the very minor maintenance impact, which can easily be countered (see detail in rev 2 of DNV report). There is likely no change to ship impact risk, but no information is provided by ORS on why they contend it increases. There is no additional reliance on lifeboats in an emergency and helicopter flights are only possible if they meet regulatory hurdles, meaning that the pilots have an acceptable workload.</p>

ORS Issue	New information or analysis	Analysis of ORS Conclusions
9- Safety case	None	<p><i>The proposed development will put Spirit Energy in the position of having to submit a Material Change which they do not support, and which would result in the viability of the continued safe operation of the affected assets being threatened.</i></p> <p>It is clear that Spirit do not support the windfarm and if they thought their operations were not viable, they would never submit such a change. However, nothing in the ORS report justifies any impact on "viability", solely making unjustified claims.</p> <p>The assertion that Spirit need to "Consider whether the development, introduces multiple cumulative impacts that have the potential to affect the major accident risks or their controls, either directly or indirectly" is an incorrect copy of the regulatory guidance, which, from paragraph 293b, of L154, the HSE Guidance to the Safety Case Regulations is <i>where a number of small changes are planned which will cumulatively have a significant impact on safety</i>. ORS has left out the word "significant". Many minor changes could affect the management of major hazards (e.g. two new flanges on hydrocarbon systems, which are both leak sources), but, like the changes brought about by the windfarm, they are not significant.</p> <p>There is no justification that the change is cumulatively material, just a statement that it is material.</p> <p>The report erroneously states that DNV just consider quantitative risk as to whether the change is material. As detailed in Section 2, this is a gross mis-representation of DNV's report.</p>

5 REFERENCES

- /1/ Anatec Limited, Morecambe Offshore Windfarm Helicopter Access Report – A5035-FLO-HAR-03, Revision 01, March 2025
- /2/ AviateQ International Limited, Morecambe Offshore Windfarm – Morecambe Bay Report, August 2024
- /3/ Effect of Proposed Morecambe Offshore Windfarm on Offshore Oil and Gas Operations 10530687-01, Rev. 2 March 2025
- /4/ Review of Impacts from Morecambe Offshore Windfarm to Spirit Energy, ORS, 120.202_TN1-A02 Mach 2025



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