Morecambe Offshore Windfarm: Generation Assets

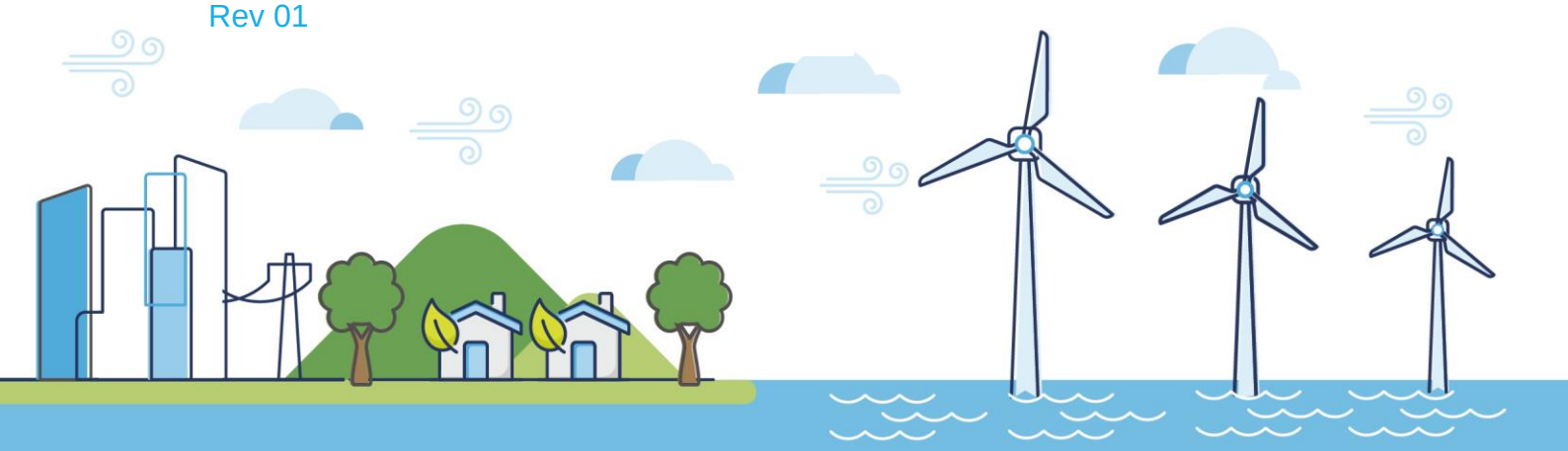
Examination Documents

Volume 9

The Applicant's Response to Spirit Energy's Deadline 4 Submission Appendix G: Third Party Review of Safety Case by CityPort Oil and Gas Services Limited

Document Reference: 9.59.7

Rev 01



Document History

Doc No	MOR001-FLO-CON-ENV-NOT-0040	**Rev**	01
Alt Doc No	245028-RPT-001		
Document Status	Approved for Use	**Doc Date**	11 March 2025
PINS Doc Ref	9.59.7	**APFP Ref**	n/a

Rev	Date	Doc Status	Originator	Reviewer	Approver	Modifications
01	11 March 2025	Approved for Use	CPOGS Ltd	Morecambe Offshore Windfarm Ltd	Morecambe Offshore Windfarm Ltd	n/a

Morecambe Offshore Windfarm Limited

Independent Peer Review

CityPort Oil & Gas Services Limited

Document Title:	Independent Peer Review
Project:	Morecambe Offshore Windfarm
Prepared for:	Morecambe Offshore Windfarm Limited
CPOGS Report No:	245028-RPT-001
Revision:	1 (For General Release)
Report Date:	11th March 2025

DOCUMENT APPROVAL AND REVISION RECORD	
Project	Morecambe Offshore Windfarm
Document Title	Independent Peer Review
Client	Morecambe Offshore Windfarm Limited
Document Number	245028-RPT-001
Custodian	CityPort Oil & Gas Services Limited
Notes	Morecambe Offshore Windfarm Limited, Flotation Energy, Morecambe Offshore Windfarm, Development Consent Order, Spirit Energy, South Morecambe Gas Field.

REV	DATE	ISSUE DESCRIPTION	PREPARED	REVIEWED	APPROVED
1	11-03-25	For General Release	DSAR	KROB	[redacted] DSAR
0	06-03-25	For Client Comment	DSAR	KROB	DSAR
A	06-03-25	Internal Review Copy	DSAR	SBRA	-

enquiries@cpogs.com

EXECUTIVE SUMMARY

Morecambe Offshore Windfarm Limited (MOWL) is the 'Applicant' for the ongoing Development Consent Order Hearing for the future Morecambe Offshore Windfarm (MOW). The proposed offshore windfarm location is to be within the immediate vicinity of the existing South Morecambe (CPC, DP6 and DP8) and Calder (CA1) gas field assets which are due to cease production within the next four years. Spirit Energy is the Seaward Production Licence (SPL) Holder of the South Morecambe gas field and Harbour Energy is the SPL Holder of the Calder gas field. Spirit Energy is the designated Duty Holder and Operator of both the South Morecambe and Calder gas fields.

The Development Plan submitted by MOWL for the windfarm has been opposed by Spirit Energy who are concerned that the windfarm layout may adversely affect their existing commercial interests in relation to the South Morecambe and Calder gas fields.

MOWL has commissioned City Port Oil & Gas Services (CPOGS) to complete an Independent Peer Review of the key documentation relating to the principal objections submitted to the Examining Authority in relation to deadline submissions numbered one to four. In particular, CPOGS has been requested to provide their professional opinion on matters relating to the UK Safety Case of the hydrocarbon installations and related operational factors. These matters have been highlighted by Spirit Energy as having the potential to adversely affect the health and safety of their ongoing and future activities in the South Morecambe and Calder gas fields.

CPOGS has completed the Independent Peer Review as requested, and our key findings relate to helicopter operations and ship collision. With respect to helicopter operations, CPOGS do not agree with Spirit Energy that restricting helicopter operations to 'Visual Flight Requirements (VFR) only' will necessarily result in a significant adverse impact on the overall safety of operations.

CPOGS consider that the primary mitigation for adopting VFR for future helicopter operations would be the provision of additional maintenance flights direct from the heliport to the Normally Unattended Installations (NUIs). Additional flights may be necessary for a limited period of time to prevent the build-up of a maintenance backlog before the South Morecambe and Calder platform assets are decommissioned.

The risk to maintenance personnel associated with helicopter shuttling to the NUIs is measured and reported in the UK Safety Case as the 'Individual Risk Per Annum' (IRPA). As a result of imposing VFR for helicopter operations, the IRPA of the present maintenance personnel working offshore for Spirit Energy is expected to *decrease*, as the frequency of shuttle flights completed by individual maintenance workers, per offshore working rotation, will decrease.

Additional shuttle flights from shore to the NUIs could be used to meet maintenance objectives, but the personnel completing the extra flights will be additional to the existing maintenance teams. Therefore, CPOGS consider the primary impact of adopting VFR for future operations is essentially a commercial matter rather than an unacceptable safety issue as Spirit Energy imply.

With respect to ship collision, Spirit Energy raises a concern that there will be a material increase in the residual risk to the fixed installations from collision/ allision scenarios linked to passing shipping. CPOGS believe this assertion is weak and it is not supported by the submissions made by Spirit Energy to date.

To the contrary, CPOGS believe that the presence of the windfarm is likely to reduce the residual shipping risk to the CPC and Calder platforms, as passing merchant ships travelling to and from Liverpool, (the largest regional port), will be diverted further away from those assets to the east or west of the new windfarm site. It is possible that the shipping risk to the DP6 and DP8 NUIs may marginally increase due to compression of passing vessel traffic into shipping lanes to the north of the Morecambe windfarm. However, any such marginal increase will not be material in nature.

CPOGS are of the opinion that none of the individual hazard scenarios described by Spirit Energy in their existing submissions are sufficient to warrant a Material Change submission of the existing Safety Cases. However, were the UK Health and Safety Executive (HSE) to exercise their legal right to request a Material Change resubmission to address cumulative smaller changes, we do not see any reasons why a Material Change should not be accepted for the windfarm development as currently proposed by MOWL.

Overall, the objections that are presented to the Examining Authority by Spirit Energy and their advisors in respect of the current Development Plan paint a very pessimistic view of how the UK HSE Inspectors would view any changes to the existing operations and the Safety Case. If the Spirit Energy view of the future were to be true, it would not be possible to introduce any windfarm developments in proximity to existing oil and gas infrastructure.

We believe that the reality is far more favourable, and that all of the proposed hazard scenarios and concerns raised by Spirit Energy can be addressed by routine amendments to existing operational and maintenance activities already described within the existing hydrocarbon installation Safety Case(s) for the South Morecambe and Calder installations.

TABLE OF CONTENTS

Executive Summary 3
Table of Contents 5
Abbreviations 6
1 Introduction 7
1.1 CPOGS Credentials 8
1.2 Documentation Reviewed 9
2 Independent Peer Review Findings 10
2.1 Proposed Changes to Helicopter Operations 10
2.1.1 Flight Safety of Arrival and Departure Helicopter Operations 10
2.1.2 Precautionary Evacuation 12
2.1.3 Essential Maintenance of the Assets 15
2.1.4 Increased Transport Risk 18
2.2 Passing Vessel Collision Risk 20
2.3 UK Installation Safety Cases 21
2.4 Morecambe Net Zero Obligations 23
3 References 25
3.1 Development Consent Order References 25
3.2 External References 25

ABBREVIATIONS

AB3	UK standard for well plug and abandonment
ALARP	As Low As Reasonably Practical
CA1	Calder Normally Unattended Installation
CAA	Civil Aviation Authority
CPC	Central Processing Complex (Platforms AP1, DP1 & CPP1)
CPOGS	CityPort Oil & Gas Services
DCO	Development Consent Order
DNV	Det Norske Veritas
DP	Dynamic Positioning
DP6 / DP8	South Morecambe Normally Unattended Installations
ER	Emergency Response
ERRV	Emergency Response and Rescue Vessel
HSE	The (UK) Health and Safety Executive
IFR	Instrument Flight Rules
IRPA	Individual Risk Per Annum
MOW	Morecambe Offshore Windfarm
MOWL	Morecambe Offshore Windfarm Limited
MW	Megawatt
NSOAF	North Sea Offshore Authorities Forum
NAI	Non Acceptance Issue (Note)
nm	Nautical mile
NUI	Normally Unattended Installation
OEUK	Offshore Energies UK
PFEER	Offshore Installations (Prevention of Fire and Explosion, and Emergency Response) Regulations 1995
POB	Personnel On Board
REWS	Radar Early Warning System
ROV	Remotely Operated Vehicle
SAR	Search and Rescue
SECEs	Safety and Environmentally Critical Elements
Tcf	Trillion Cubic Feet
UK	United Kingdom
VFR	Visual Flight Rules

1 INTRODUCTION

Morecambe Offshore Windfarm Limited (MOWL) is the 'Applicant' for the ongoing Development Consent Order Hearing for the future Morecambe Offshore Windfarm (MOW) to be located in the eastern area of the Irish Sea in water depths of 18-40m.

The Generation Assets of the Morecambe Offshore Windfarm will include fixed-foundation wind turbine generators, inter-array cables, offshore substation platform(s), and possibly platform-link cables for substations. The windfarm will have an expected nominal capacity of 480MW.

The proposed offshore windfarm location is situated outside of the installation 500m zones, but in the immediate vicinity of the South Morecambe and Calder gas fields, which are currently expected to cease all production around 2027 (+/- 2 years). An important factor in the windfarm site's selection was the potential for the project to be the first windfarm to fully co-exist with oil and gas operations on previously developed seabed. The offshore windfarm site was selected as part of the Crown Estate's Offshore Wind Leasing Round Four.

Several operational windfarms are already located near the proposed site. Two larger Round Four offshore windfarms are also planned to the west of the site. The implementation of the Morecambe Offshore Windfarm will support the UK Government's commitments to achieve net zero carbon emissions by 2050, and to tackle the climate emergency by increasing the production of electricity from renewable energy.

The proposed windfarm site overlaps with the existing legacy hydrocarbon infrastructure of platforms, pipelines, cables and wells. Within the South Morecambe and Calder gas fields, the hydrocarbon assets are owned by two energy companies - Spirit Energy and Harbour Energy respectively. However, Spirit Energy is the appointed Duty Holder and Installation Operator of the South Morecambe multi-platform installation hub, the South Morecambe NUIs DP6 and DP8, and the Calder platform CA1 on behalf of all licence holders.

The Development Consent Order (DCO) process for the Morecambe Offshore Windfarm began in October 2024 and the examination schedule contains a number of deadline submission dates. Deadline Submission Five (D5) is scheduled for closure on Tuesday the 11th of March 2025.

The development plan submitted by MOWL for the Morecambe Offshore Windfarm has been opposed by Spirit Energy who are concerned that the windfarm layout may adversely affect their existing commercial interests, in relation to the South Morecambe and Calder gas fields.

The key objections raised by Spirit Energy are that the present windfarm development plans will have a significant adverse effect on the overall safety of South Morecambe and Calder oil and gas operations. Spirit Energy has indicated that the adverse consequences could be of sufficient magnitude to be considered 'unacceptable' with respect to major accident risks and could impact their currently accepted UK Safety Case. It is concluded by Spirit Energy that the impact of the proposed operational changes will contravene UK health and safety requirements as defined within the Relevant Statutory Provisions unless they are radically curtailed.

MOWL has commissioned City Port Oil & Gas Services (CPOGS) to complete an Independent Peer Review of the key documentation relating to the principal objections submitted to the Examining Authority as part of the DCO in respect of deadline submissions numbered one to four. In particular, CPOGS has been requested to provide feedback to the UK Safety Case matters and related operational safety factors that have been highlighted by Spirit Energy as having the potential to negatively affect their ongoing and future activities adjacent to and within the windfarm operating location.

1.1 CPOGS Credentials

CPOGS is a specialist Technical Safety engineering consultancy which supports clients who are active in the Oil & Gas offshore energy sector. CPOGS recent client engagements include Offshore Energies UK (OEUK), who are the leading trade association for the UK offshore energy industry, as well as leading companies in the UK and international energy sectors such as Bluewater Offshore, Haliburton, Heerema, Helix, KCA-Deutag, Petrofac, Prosafe Offshore, Shell, Total Energies and Weatherford.

In the last three years, CPOGS engineering consultants have prepared Safety Cases for new UK installations that have been reviewed and accepted by the UK Competent Authority, the Health and Safety Executive (HSE). CPOGS has also completed the preparation of multiple 'Material Change' Safety Case submissions to the UK HSE, all of which have been accepted on schedule, and without significant amendments to the proposed changes.

CPOGS engineering consultants routinely lead and direct the statutory five-yearly independent 'Thorough Review' processes for some of our Clients' UK installations. They also undertake site audits on mobile oil and gas installations re-entering the UK Sector. The auditing work is necessary to ensure compliance with all UK Relevant Statutory Provisions, and it provides our consultants with a unique overview of UK compliance requirements as understood by the UK HSE Inspectors.

This Independent Peer Review has been led by CPOGS CEO Diccen Sargent - a degree qualified Technical Safety Engineer with over 35 years' experience in the Oil & Gas industry. He is currently working closely with both the OEUK and the UK HSE to resolve emergency response issues relating to the increasing size and weight of UK Offshore workers. Mr Sargent has previously made presentations to UK HSE Inspectors in 2024 as a Subject Matter Expert in relation to offshore lifeboat provisions, and in May 2025, he will be presenting similar research material to the North Sea Offshore Authorities Forum (NSOAF).

CPOGS clients include all of the largest companies who provide mobile accommodation support vessels (Flotels) in the UK Offshore Sector. Our engineering consultants have direct contact with UK HSE Inspectors to clarify HSE requirements in relation to UK relevant statutory provisions on behalf of our clients.

Within this report, the principal conclusions of the Independent Peer Review completed by CPOGS are provided.

1.2 Documentation Reviewed

The publicly available documents listed below have been reviewed by CPOGS consultants in March 2025 during the completion of the Independent Peer Review.

Party	Title	Document #	Report Date
Spirit Energy	Relevant Representation of Spirit Energy Production UK Limited in Response to the S56 Notice, PIN Reference: EN010121.	RR-077	19 Aug 2024
Spirit Energy	Written Representation of Spirit Energy Production UK Limited, EN010121, Unique Reference: 20049981.	REP1-116	26 Nov 2024
MOWL	3.5 Development Consent Order: Schedule 3 Spirit and Harbour Protective Provisions Plan - Revision 01 (Volume 3).	REP2-007	12 Dec 2024
MOWL	5.2.17.2.1 Environmental Statement Appendix 17.2 Radar Early Warning System Technical Report - Revision 02 (Volume 5) (Tracked)	REP3-035	22 Jan 2025
MOWL	PIN Reference 9.43 Remaining Responses from the Applicants to Spirit Energy Deadline 1 Submissions – Revision 01 (Volume 9).	REP3-070	22 Jan 2025
MOWL	PIN Reference 9.43.2 Responses from the Applicant to Spirit Energy Deadline 1 Submissions Appendix B Effect of Proposed Morecambe Offshore Windfarm on Oil and Gas Operations – Revision 1 (Volume 9).	REP3-072	22 Jan 2025
Spirit Energy	Deadline 4 Submission by Spirit Energy - Response to the Applicant’s Deadline 3 Submissions, Reference: 20049981.	REP4-069	18 Feb 2025

2 INDEPENDENT PEER REVIEW FINDINGS

This section of the report provides a summary of the specific findings of the Independent Peer Review. The findings are broken down into the key subject areas which CPOGS consultants conclude are at the heart of the objections raised by Spirit Energy in respect of the proposed Morecambe Offshore Windfarm development.

2.1 Proposed Changes to Helicopter Operations

One of the key changes to Spirit Energy's current offshore hydrocarbon operations that is proposed as part of the Morecambe Offshore Windfarm development plan is to create a buffer zone of 1.5 nautical miles (nm) between the siting of the wind turbines and the Helidecks of the existing CPC and NUI hydrocarbon installations. The placement of the wind turbines will therefore result in changes to the existing helicopter flight requirements.

In the absence of the windfarm, the helicopters servicing the South Morecambe and Calder hydrocarbon installations can operate in sub-optimal weather conditions by using their aircraft instruments. This flying method is known as Instrument Flight Rules (IFR). After the windfarm turbines closest to the hydrocarbon installations are installed, the creation of the 1.5nm buffer zone for helicopter operations will require the helicopter pilots to follow Visual Flight Rules (VFR). This change in helicopter operating procedures will exclude further routine nighttime flying and introduce a higher standard for both visibility and cloud base levels before routine helicopter flying is permitted.

Spirit Energy have concluded that the introduction of the 1.5nm helicopter buffer zone is unacceptable to them as it will adversely affect the following:

- The overall flight safety of arrival and departure helicopter operations.
- Existing precautionary evacuation processes.
- The ability to complete essential maintenance of the hydrocarbon assets.
- Risk levels associated with 'shuttling' for maintenance activities.

Each of the above concerns are described and addressed in more detail below.

2.1.1 Flight Safety of Arrival and Departure Helicopter Operations

Within the Spirit Energy Written Representations [REP1-116], there is significant discussion relating to the overall levels of safety that can be achieved for helicopter arrival and departure operations following the introduction of the 1.5nm helicopter buffer zone. There are two opposing technical views that have been articulated by the respective aviation experts representing MOWL and Spirit Energy. It is outside of the expertise of CPOGS consultants to comment on the relative merits of the specialist arguments raised by the aviation industry experts. However, CPOGS can offer an informed opinion with respect to the potential impact of such changes on the existing Safety Case(s) of the hydrocarbon assets.

UK Safety Cases for fixed installations will generally contain the following summary information in relation to helicopter operations:

- A description of the offshore Helideck(s).
- A description of the Helideck crewing arrangements.
- A description of the arrangements for weather monitoring and reporting to support helicopter operations.
- A description of the Helideck Emergency Response provisions.
- A description of standby vessel requirements to support helicopter landing and take-off.
- A description of platform arrangements to prevent down-draught debris hazards.
- Confirmation of the onshore Heliport(s) used for routine crew transfers to and from the installation.
- A description of the flight rotation frequency for core crew.
- A description of any permitted shuttling operations.
- A calculation of the residual individual risk levels for offshore personnel.

It must be noted that CPOGS has not had sight of the Spirit Energy Safety Cases, but the above list of information to be included is typical for a fixed UK oil and gas installation, and generally relates to requirements defined by the Safety Case Regulations [1], existing Safety Case document templates and a variety of HSE and industry guidance documents.

It would be highly unusual for the South Morecambe and Calder Safety Case(s) to include specific details of aeronautical restrictions on permissible flying conditions for helicopter operations. These details would vary depending on the type and capacity of aircraft employed. The standard expectation is that the helicopter operating company and the Duty Holder will systematically follow the requirements dictated by the Civil Aviation Authority (CAA) who have a memorandum of understanding in place with the UK HSE regarding aviation matters.

Specific flight limitations are not normally documented in offshore Safety Cases. A key reason for not including such information in the Safety Case is that it would then be necessary to revise and update the offshore installation Safety Case every time there was a change in the aeronautical procedures and requirements of the relevant authority, the CAA - all of which are outside of the control of the Duty Holder.

Therefore, CPOGS are confident that a change in the helicopter buffer zone radius to 1.5 nm will not require a ‘Material Change’ to the South Morecambe and Calder Safety Case(s) as this information is not already described or required to be addressed within the standard UK Safety Case content.

2.1.2 Precautionary Evacuation

One of the concerns that Spirit Energy raise in their 'Relevant Representation' document [RR-077] dated 19th of August 2024 is the potential restriction on 'Non-Emergency Downmanning' or 'Precautionary Evacuation' as it is more commonly known. Both of these industry terms refer to the same hazardous event scenarios where the Duty Holder believes it is necessary to remove personnel from the installation in a controlled manner to further reduce residual risk.

Precautionary evacuation is a very different situation to a full emergency evacuation of an installation. A full emergency evacuation is usually required when one of the major accidental events described within the installation Safety Case arises and is not immediately controlled. In such situations where there is an immediate threat to life and limb, the affected installation will be evacuated using the lifeboats. This method of evacuation allows all personnel to be evacuated within a very short period of the major accidental event occurring, and generally less than one hour.

In Paragraphs 5.38 and 5.39 of the Spirit Energy Relevant Representation [RR-077], some examples are provided of non-emergency downmanning 'scenarios' where it is considered necessary to remove personnel in a controlled manner using the civilian helicopter transport provisions. These scenarios include:

- Contagious illness.
- Loss of utilities such as power, water, heating, etc.
- Extreme weather events.
- Non-emergency medical evacuation.

Spirit Energy note that the imposition of the 1.5nm helicopter buffer zone shall increase the time required to complete a precautionary evacuation from 1.5 days to 2.0 days because of the loss of IFR and nighttime flying activities. This calculation is not disputed. However, the evacuation scenario provided is classed as 'precautionary' and is not a genuine emergency situation. Therefore, the extra half day should not be considered a critical adverse safety effect likely to result in a 'Material Change' to the accepted Safety Case(s). Further analysis on the example scenarios listed above is provided below.

Contagious Illness

Concern: Spirit Energy has raised a concern that relocation to shore of personnel who contract contagious illness will be adversely affected by the imposed 1.5nm helicopter buffer zone.

The Examining Authority should note that at accommodation platform within the Central Processing Complex (CPC) will be equipped with extensive medical facilities and a paramedic, enabling personnel with contagious diseases to be quarantined. If the personnel displaying contagious symptoms require emergency evacuation, they can be relocated to shore using existing Search and Rescue (SAR) provisions. SAR provision is not impacted by the proposed 1.5nm helicopter buffer zone.

Loss of Utilities

Concern: Spirit Energy has raised a concern that relocation of personnel to shore following loss of utilities on the Central Processing Complex will be negatively impacted by the introduction of the 1.5nm helicopter buffer zone.

Loss of utilities may well occur on one of the South Morecambe CPC installations, but the Offshore Installations (Prevention of Fire and Explosion, and Emergency Response) Regulations 1995 (PFEER) [4] require that effective emergency provisions are provided for key utilities such as power, communications and lighting. Such emergency provisions have not been acknowledged as a mitigating factor by Spirit Energy in their submissions. The emergency generators installed on offshore installations that comprise the CPC are sufficient to maintain lighting and critical utilities to ensure safety of life. In almost all such circumstances, the maintenance teams onboard CPC will restore services before the loss has a critical impact to personnel. To suggest that loss of utilities is a valid argument for immediate precautionary evacuation is not realistic.

Extreme Weather Events

Concern: Spirit Energy has raised a concern that extreme weather events in the Irish Sea may necessitate precautionary evacuation of the platform complex.

It is CPOGS view that extreme weather events are highly unlikely to result in a precautionary evacuation of the South Morecambe central processing complex. Inclement weather in the Irish Sea is considerably more benign than in the North Sea. Whilst we must repeat the fact that we have not had the opportunity to review the South Morecambe Safety Case, it would be highly unusual if the Morecambe CPC Safety Case describes and includes precautionary evacuation arrangements as valid risk mitigation measures for extreme weather events in the Irish Sea.

Figure 2.1 overleaf, taken from the UK HSE Research Report RR392 [2] shows that extreme winter significant wave height is less than 9 metres, for the 100 year return period. This is 8 metres less than the significant wave height experienced by similar offshore fixed installations located within the Northern North Sea.

The environmental data above makes it highly unlikely that precautionary evacuation of the South Morecambe CPC platforms would be either envisaged or necessary to address local extreme weather events, - particularly as the decision to start the evacuation process would need to occur at least two days before the weather event arrives in the Irish Sea.

CPOGS has existing clients who do rely upon precautionary evacuation processes to mitigate extreme weather risks to their UK installations. In such circumstances, detailed procedures have been developed which commence a full four days before the extreme weather arrives. If Spirit Energy have made such commitments within their present Safety Cases, we would have expected to see more detail of this in their existing submissions.

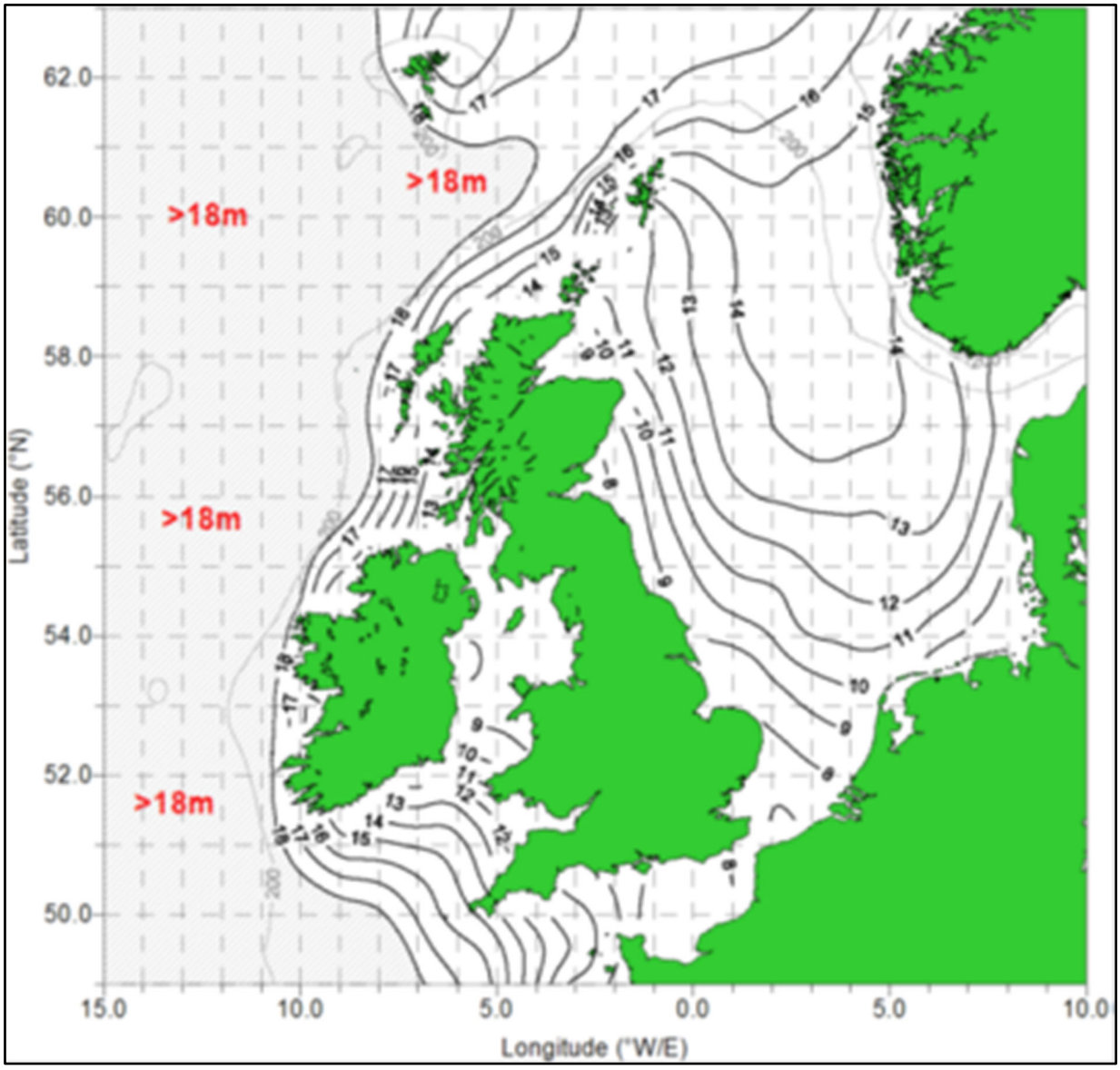


Figure 2.1 - 100 Year Extreme (Winter) Significant Wave Heights around the UK (taken from Research Report RR392).

Non-Emergency Medical Evacuation

Concern: Spirit Energy has raised a concern that a non-emergency medical evacuation such as a deteriorating medical condition or a death may be negatively impacted through a delay to the evacuation if IFR and nighttime flying is not permissible.

CPOGS have carefully considered the above concerns and we consider them to be without serious substance or merit. It is our view that in the tragic event of a death onboard, it would be safe to wait until daylight, or until visibility improves for the body to be transported back to the mainland. There are standard procedures in place for medics offshore that address the actions required of them in such situations.

Personnel who are affected by a deteriorating medical condition, but do not require immediate emergency medical evacuation will be attended to in the extensive medical facilities offshore, which contain all of the essential medical equipment and medicines that one would require for immediate medical treatment. All such medical facilities meet stringent industry standards, are developed and approved at an industry level, and are competent to address delays in platform to shore transfers.

With respect to the South Morecambe CPC Safety Case, it is CPOGS view that a short delay to non-emergency downmanning is not an adverse measure that will result in HSE enforcement action, or one that will prevent the hydrocarbon assets from continuing to operate in future.

CPOGS are also firmly of the opinion that the increase in the time for Spirit Energy to complete a precautionary evacuation of the South Morecambe platform complex will not result in the need for the Safety Case to be updated to reflect a 'Material Change' amendment.

Whilst the Safety Case(s) may describe the ability to carry out a precautionary evacuation, we consider it highly unlikely that the existing Safety Case(s) will include actual time-based performance standards, or specific operational targets for completing a non-emergency evacuation of personnel. Therefore, we consider it unrealistic that any perceived changes to precautionary evacuation arrangements will necessitate Material Change updates to the existing Safety Case revisions.

2.1.3 Essential Maintenance of the Assets

Concern: Spirit Energy has raised a concern that the creation of the 1.5nm helicopter buffer zone will have a knock-on effect on completing required maintenance on the Normally Unattended Installations (NUIs) according to defined and agreed schedules.

To ensure that the satellite installations remain safe to operate, regular visits to the NUIs are required to carry out both routine scheduled maintenance and reactive maintenance to address failures. The visits to the NUIs to complete maintenance are undertaken by dedicated teams of maintenance personnel, who are transferred to and from the Central Processing Complex (CPC) and the NUI by helicopter.

One of the perceived consequences of implementing the 1.5nm helicopter buffer zone will be a reduction in the frequency of suitable flying conditions to provide helicopter shuttling of personnel to and from the NUIs. As helicopter flying will only be possible using Visual Flight Rules (VFR) following construction of the windfarm, some of the opportunities to transfer personnel whilst flying using Instrumented Flight Rules (IFR) will be lost. In addition, as VFR flights can only occur during daylight conditions, the duration of some the maintenance periods achievable on the NUIs may also be reduced to a shorter duration.

Both Spirit Energy and MOWL agree that the application of the 1.5nm buffer zone will have the above effects. However, there is general disagreement over the magnitude of the potential reduction, which could be greater than 20% according to Spirit Energy's own calculations.

Spirit Energy also infer that the creation of the 1.5nm buffer zone will have an unacceptable impact as it will prevent them from completing scheduled 'safety critical' maintenance activities according to the required schedule. If this impact was proven to be the case (and was shown to be unavoidable), then this could be a valid reason for the UK HSE to take enforcement action to the detriment of Spirit Energy. It is therefore important to expand further regarding maintenance requirements for the South Morecambe and Calder hydrocarbon assets for the benefit of the Examining Authority to demonstrate that this is not a valid objection.

The first offshore fixed installation of the South Morecambe platform hub was installed in 1985. As such, some parts of the Central Processing Complex (CPC) are nearly 40 years old and are operating beyond the original design life envisaged at the time of construction. It is perfectly feasible to keep older installations fully functional and safe to operate as Spirit Energy are doing, but to do so generally requires significant amounts of maintenance activity.

Furthermore, as older platforms age beyond their design life, the frequency of operational failures increases, requiring further unscheduled maintenance activity to rectify those failures. The NUIs within the South Morecambe and Calder Fields are in a similar maintenance situation as aging installations. For example, the Calder platform was originally installed in 2002 and is now 23 years old. If the Calder platform has not actually reached its original stated design life, it is likely to be close to it, and it in turn will have significant scheduled and ad-hoc maintenance requirements.

The present maintenance model followed by Spirit Energy is to base the majority of maintenance personnel onboard the Morecambe Central Processing Complex. Those maintenance personnel will have responsibilities to complete maintenance both on the CPC itself, the Calder platform and also on the South Morecambe NUIs DP6 and DP8. When maintenance is required onboard the NUIs, maintenance personnel are transferred by means of a short helicopter shuttle flight from the CPC whenever feasible.

The maximum personnel capacity of the Morecambe CPC is limited to 177 personnel of which only a proportion of that number will be assigned to maintenance activities. It is CPOGS opinion that Spirit Energy may already struggle to complete all scheduled maintenance activities from the CPC as there is evidence from the Vantage-POB flight records that some maintenance flights to the NUIs already depart directly from Blackpool. It is quite probable that such direct flights are required as there are likely to be insufficient maintenance personnel available on the CPC to provide the required manpower at peak times, particularly to address ad-hoc failures.

The maintenance and upkeep of aging installations is a key issue within the Oil & Gas industry, and it is an issue that the UK HSE Inspectors consider to be particularly important. CPOGS are aware from direct feedback provided by our other Oil & Gas Clients that the continual build-up of a backlog in critical maintenance, particularly associated with Safety and Environmentally Critical Equipment (SECEs), will result in enforcement action by UK HSE Inspectors.

It should be noted that Spirit Energy will be no different in respect of its maintenance issues and obligations to many other offshore Duty Holders managing elderly fixed installations. Maintenance management is an industry wide issue in the UK sector. Spirit Energy are a direct member of the OEUK Maintenance Working Group, which was formed to develop an acceptable industry standard to maintenance delivery and optimisation.

In 2022, Spirit Energy provided experienced maintenance personnel who were part of the industry working group that prepared and issued the OEUK document 'Maintenance Backlog Measurement, Interpretation and Measurement Guidelines' [3]. This document indicates the importance of maintenance operations to Spirit Energy in respect of their existing assets.

The UK HSE work closely with Installation Operators such as Spirit Energy, who are maximising economic returns from older assets, but are potentially struggling to keep up with the ever increasing maintenance burden. The UK HSE want maintenance backlogs reduced, not increased and they exert maximum pressure on Operators to ensure this reduction happens. However, it is often the case that the older platforms simply do not have enough bed capacity to do so without introducing additional measures.

In the last year, the general pressure on Spirit Energy to maintain maintenance schedules will have increased as the HSE have noted that the weight and size of UK offshore workers is increasing and has requested Duty Holders to actively respond to this issue. The increase in size and weight of UK offshore workers often means that existing lifeboats installed on fixed installations are unable to accommodate as many offshore personnel as originally designed or intended.

It is becoming increasingly apparent that Duty Holders like Spirit Energy may be required to decrease the maximum permitted number of personnel on board (POB) installations such as the CPC at least temporarily. The manning reduction is necessary to ensure that the existing evacuation measures are suitable for use in accordance with PFEER [4] Regulation 15 and Regulation 19 requirements, and to ensure Emergency Response (ER) equipment is fit for purpose until such time as the lifeboats can be upgraded or replaced.

Whilst the lifeboat issue is not related directly to the windfarm proposal, it does highlight the pressure experienced by Spirit Energy in maintaining maintenance schedules, and hence why potential restrictions to helicopter flying are so important to them.

There is an immediate solution to the above maintenance issue, which could significantly negate the impact of the highlighted maintenance problems. That solution is to increase the frequency of maintenance flights directly from the onshore heliport to the NUI satellite installations using additional maintenance personnel.

The analysis of the Vantage-POB data described in the Det Norske Veritas (DNV) Report [REP3-072] makes it clear that daily flights to the individual NUIs are not required. Therefore, the provision of an additional helicopter located onshore at Blackpool, coupled with shore-based maintenance personnel, could significantly alleviate (or eliminate) the maintenance backlog issue referred to by Spirit Energy by permitting more frequent NUI visits.

In the longer term, CPOGS would also recommend that Spirit Energy consider the feasibility of adding access platforms to the NUIs to allow maintenance personnel to transfer using 'walk-to-work' boats if the remaining production lifetime is extended. When the NUIs were installed 20 years ago, walk-to-work boats did not exist as a valid concept. However, in 2025 the development of the offshore wind industry has made such personnel transfer models routine. The use of walk-to-work vessels could enable Spirit Energy personnel to access the NUIs in a greater range of weather conditions than may be presently possible using helicopters alone. This change in operation would constitute a Material Change Safety Case submission, but we see no reason why the Competent Authority would object to the proposal.

It is clear from the reported analysis of the Vantage-POB flight data completed by DNV that direct flights to the NUIs from shore is already a permitted activity with respect to the Safety Case. Therefore, it seems improbable that increasing the frequency of direct flights should constitute a 'Material Change' to the currently accepted Safety Case. Spirit Energy would not have been able to conduct direct maintenance flights from shore if they were not part of the present Safety Case scope of permitted operations.

From the above analysis, it is clear that the creation of the 1.5nm helicopter buffer zone may adversely affect the ability of Spirit Energy to carry out essential maintenance from CPC as per the current model. However, the recommended solution would be to increase the frequency of direct flight operations from the Heliport onshore to achieve the desired maintenance levels.

CPOGS are firmly of the opinion that maintenance concerns for the satellite NUIs are a temporary cost issue for which protection can be provided by MOWL, rather than a critical safety issue which will inevitably result in enforcement action by the UK Regulator as Spirit Energy have inferred in their submissions.

2.1.4 Increased Transport Risk

Concern: Spirit Energy has raised a concern that the reduction in the frequency and duration of helicopter visits to the NUIs will result in unacceptable increases in transport risk for maintenance activities / workers.

CPOGS consultants believe this assertion raised by Spirit Energy to be incorrect, for the following reasons we shall explain below.

Within the UK Safety Case model, Duty Holders are legally required to calculate the 'Individual Risk Per Annum' (IRPA) for all offshore personnel on their installation. In simple terms, the IRPA is a numerical measure of how likely an individual is to suffer a fatal accident in any working period of a year when employed offshore. As the name suggests, IRPA only applies to each individual and it is not a collective measure of risk.

Duty Holders are required to ensure that the IRPA value is and always remains, less than one in one thousand per year, or the source of risk is considered intolerable. IRPA values that are less than

one in a thousand per year are considered acceptable, if the residual risk level can be shown to be 'as low as reasonably practical' (ALARP). Where residual risks are less than one in one million, the risk profile is considered 'broadly acceptable'.

Within their submissions, Spirit Energy note that the absolute number of helicopter flights per year may need to increase as a result of the application of the helicopter buffer zone. They state the concern that the collective risk to offshore maintenance personnel as a whole may increase and this increase will be judged to be unacceptable by the UK Regulator. However, the *collective* risk to the maintenance group is not a measure that is assessed within the Safety Case. The only risk metric that is relevant in UK offshore health and safety law to personnel is IRPA. The UK Regulator does not assess the merit of the Safety Case in respect of collective risk measurements.

It can be demonstrated that if the daily frequency of permitted flights to the NUIs from the CPC decreases, as a result of the application of the 1.5nm buffer zone, then the number of flights taken by any one maintenance person during their standard working period offshore is much more likely to fall, rather than increase. Therefore, their IRPA in respect of helicopter operations is also likely to decrease.

To provide a clear example of why this statement must be true is to imagine the case of a maintenance person based on CPC completing a normal three week offshore rotation. Each day, if the weather is within permitted flight conditions, the maintenance person gets onboard a helicopter in the morning, shuttles to an NUI, completes their allotted maintenance tasks and then flies back to CPC in the evening.

Today, with limited restrictions on helicopter flights, the maintenance person might for example complete say 19 helicopter journeys in their working period offshore. However, once the helicopter buffer of 1.5nm is applied, they may only be able to shuttle to an NUI on 16 days of the 21 day working period. Therefore, it is clear that the IRPA of the maintenance person is much more likely to decrease rather than increase as suggested by Spirit Energy.

The implication of the reduced frequency and duration of maintenance shuttle flights that could occur is that more maintenance personnel may need to be employed by Spirit Energy to achieve the same long term maintenance objectives.

As mentioned in the previous section, the potentially limited availability of bed space offshore on the CPC means the logical solution to this situation would be for Spirit Energy to base the additional maintenance personnel onshore. However, it should also be noted that the IRPA for those additional personnel based onshore to complete the existing maintenance burden will also be less than for maintenance personnel employed offshore today, as personnel based onshore will be subject to the same VFR flying restrictions for CPC, CA1 and DP6 following the installation of the wind farm.

As the IRPA of maintenance personnel is expected to fall by a small amount, CPOGS consultants cannot see why there will be any requirement for a Material Change update of the South Morecambe and Calder Safety Case(s). The residual risk values reported within the Safety Cases for permitted

activities such as helicopter travel are required to be conservative in nature to allow for natural variability. The reported risk levels within the Spirit Energy Safety Cases will still be representative for personnel.

As mentioned previously, it is clear that direct flights to the NUIs are already permitted by the Safety Case, so the change in departure point for maintenance personnel travelling to the NUIs should not be an issue either and will not require a Material Change update of the Safety Case.

2.2 Passing Vessel Collision Risk

Concern: Spirit Energy has raised a concern that the risk of a collision from a passing vessel with a platform may significantly increase due to the fact that the creation of the wind farm may divert existing passing shipping closer to the platforms.

CPOGS engineering consultants have reviewed this concern and we believe a much more detailed justification from Spirit Energy is required before this concern can be accepted as valid.

The current location of the South Morecambe and Calder installations is extremely well-known to shipping within the Irish Sea as the assets and the field itself have been in place for decades. The main ports in the eastern area are Heysham, Douglas (Isle of Man) and Liverpool, with Liverpool being by far the largest port. All vessels transiting to and from these ports have charts indicating the presence of the existing installations.

CPOGS believe the addition of the windfarm assets are more likely to result in a reduction in the residual shipping risk to the CPC and Calder platforms as it will prevent shipping to and from Liverpool, from passing as close to those assets as they are presently able to do so. The proposed offshore windfarm is to the south of the South Morecambe and Calder gas field installations and will obstruct the path of shipping.

The port of Heysham to the northeast has established ferry routes to Dublin (Seatrucks) and the Isle of Man (the Steam Packet), but consideration of the current shipping routes for these services makes it appear unlikely that these will be impacted by the creation of the new offshore windfarm. It is possible that the shipping risk to the DP6 and DP8 NUIs may marginally increase due to compression of existing Heysham traffic into shipping lanes to the north of the Morecambe windfarm. However, any such marginal increase will not be material in nature.

In any case, all of the regular shipping users and stakeholders for these ports will be extensively consulted as part of the consenting process and new passage routes or mitigations agreed if such changes are considered necessary.

Within Section 6.18 of the Spirit Energy Relevant Representation Document [RR-077], concern is highlighted regarding potential restrictions to Radar Early Warning Systems (REWS) caused by the installation of the windfarm turbines. It is noted that MOWL submitted a revised and updated REWS

assessment at D3 [REP3-035] in January 2025, which addressed the comments of Spirit Energy and Spirit have acknowledged the update made.

It is also expected that the South Morecambe and Calder assets and the Morecambe windfarm operations team will collaborate and co-operate in respect to monitoring and controlling passing shipping risks. MOWL will have a duty to monitor passing shipping risk with respect to the windfarm assets and collaboration will assist Spirit Energy with monitoring and controlling the risk to their assets too.

The presence of work boats within the windfarm area is likely to be of assistance to the South Morecambe and Calder installations in the event that a large vessel loses power and drifts towards an installation. Therefore, the residual risk of a collision resulting from loss of power scenarios affecting passing shipping is also reduced.

With respect to the South Morecambe and Calder Safety Case(s), CPOGS consider it very unlikely that the residual risk from shipping collision will materially increase, or that a Material Change update will be required. It may be necessary for Spirit Energy to update their collision risk studies to account for the wind farm presence, but the risk management procedures and approach will be effectively unchanged.

2.3 UK Installation Safety Cases

Within the various Spirit Energy reports contained within the DCO data room, the subject of a ‘Material Change’ to hydrocarbon installation Safety Cases is mentioned relatively frequently. It is also inferred that a ‘Material Change’ to a Safety Case may be refused, with the implication that the South Morecambe and Calder assets may have to cease production as a result. CPOGS consultants believe this to be a very pessimistic view of the offshore safety case regime presented by Spirit Energy and one that therefore requires further discussion.

Safety Cases are initially prepared and then submitted to the UK HSE for review who either accept or reject the Safety Case. Once the case has been accepted, the Duty Holder is required to operate according to the requirements of the Safety Case. The Safety Case for the South Morecambe CPC will have been prepared and submitted initially in the 1990’s and the Duty holder has been obliged to comply with the Safety Case ever since.

The Duty Holder has an ongoing obligation to keep the Safety Case updated. The updating process is effectively continuous and every time the Safety Case is updated, a copy is uploaded to the UK HSE online portal.

Updates to the Safety Case are generally considered to be in one of two categories. They are routine updates and ‘Material Change’ updates. The HSE are not required to review routine updates, but they are required to review and accept Material Changes.

The definition of what is considered to be a 'Material Change' is ambiguous. The main source of formal reference is the guidance notes that are contained in the HSE guidance document 'L154', that relates to the 2015 Safety Case Regulations [5]. Regulation 24 of the 2015 Safety Case Regulations [1] documents the requirement for 'Material Change' and from the accompanying guidance notes, it is generally accepted that the following situations will require a 'Material Change' submission to be prepared:

a) Modifications or repairs to the structure or any plant and equipment where the changes have or may have a significant impact on safety.
b) Where a number of small changes are planned which will cumulatively have a significant impact on safety.
c) The introduction of new activities on the installation or in connection with it including new kinds of combined operation.
d) Where there is a change in operator or owner.
e) An extension of use of the installation beyond its original design life.
f) Early stage dismantling activities undertaken before the submission of a specific dismantling Safety Case.
g) Decommissioning a production installation and connected pipelines prior to dismantling.
h) Introduction of new technology or technological approaches to controlling risks.
i) Introduction of new well control measures or other arrangements arising from well notifications which result in changes to the basis on which the Safety Case was accepted (for example, new arrangements to deal with high-pressure/ high-temperature wells).

Operational precedent has also confirmed that the UK HSE regard other significant events to be sufficient to trigger a 'Material Change' to the accepted Safety Case. For example, it is known that any change in the maximum number of personnel permitted to be on the installation at any one time (the POB) is sufficient to trigger a 'Material Change', even if the change is only one person.

'Material Changes' may be required irrespective of whether the residual level of risk materially increases or decreases. CPOGS has recently prepared a 'Material Change' Safety Case submission for a client in relation to UK helicopter operations that was welcomed and accepted by the HSE as improving overall helicopter safety. However, it was still necessary for the Client's Safety Case to be the subject of a 'Material Change' assessment by the UK HSE.

When a 'Material Change' is submitted to the Competent Authority for review, it does not stop the Duty Holder from continuing to operate according to the current Safety Case revision. The 'Material Change' process addresses proposed changes to future operations. If the UK HSE have any potential objections to the 'Material Change' submission, they will issue a 'Non Acceptance Issue' (NAI) letter to the Duty Holder describing the nature of their concern and how the Duty Holder might address it. The matter raised is then debated between the UK HSE and the Duty Holder until an acceptable solution is agreed and revised wording for the updated Safety Case is agreed.

As a result, a 'Material Change' submission should be considered to be part of the formal change control process, rather than a hard stop. The UK HSE Inspectors appreciate good communication with Duty Holders to ensure risks are appropriately managed, and it is incumbent for Spirit Energy to keep their HSE focal point informed as to ongoing discussions regarding the proposed wind farm development.

The Safety Case 'Material Change' process is separate and distinct to the enforcement process whereby the UK HSE issue an improvement notice or prohibition notice in relation to ongoing operations. These regulatory enforcement events generally occur when the Operator / Duty Holder is not operating their installation in accordance with what is stated in the Safety Case. However, should the Competent Authority at any time determine that the contents of the Safety Case are insufficient to address present major accident risks as they perceive them to be, it may also prohibit ongoing operations, until the Safety Case is updated, submitted and accepted. Such situations are a very rare occurrence.

Based on CPOGS experience of working closely with UK Oil & Gas Clients over the last 15 years to maintain update and change UK Safety Cases, we are firmly of the opinion that Safety Case updates are a standard process, be they routine or material in nature.

We would also stress to the Examining Authority that whilst CPOGS do not believe the scenarios described by Spirit Energy will necessitate a Material Change submission of their Safety Cases, the fact that an update may ultimately be prepared by Spirit Energy for their own benefit is not a reason for curtailing or preventing the planned development of the windfarm.

2.4 Morecambe Net Zero Obligations

Whilst carrying out the peer review of the publicly available documents, the main focus of CPOGS consultants has been with respect to Safety Case matters arising from the creation of the wind farm. However, in doing so, we have also noted a further issue which we wish to clarify/ advise on.

In their Written Representation document [REP1-116] Spirit Energy claim in paragraph 3.26 that it will be necessary to monitor and access plugged and abandoned wells C5 and 110/08-2 to the south of the windfarm area for future CO_2 leakage. In the event that CO_2 leakage is detected from the abandoned wells, it is claimed by Spirit Energy that it will be necessary to bring in a drilling rig over the wellhead location to work over the wells.

However, in the preceding paragraph 3.25, Spirit Energy have also noted that the same two wells could only be entered by drilling a relief well from an offset location to rectify CO_2 leakage to surface.

CPOGS carry out significant work for other clients in relation to drilling activities, including 'plug and abandonment' programmes. If the two mentioned wells have been fully plugged and abandoned in accordance with UK AB3 requirements, then the surface wellhead will have been removed, and it will not be possible to re-enter the existing well from the old wellhead location. Any potential re-entry will only be from an offset relief well location, which can be located much further away and outside of the windfarm area.

Given that the South Morecambe and Calder fields have been extensively depressurised by the removal of some six trillion cubic feet (6Tcf) of natural gas, we would also question the expected frequency with which such an event of CO_2 gas leakage to surface might occur. From a frequency perspective, the likelihood of such an event occurring is considered less than negligible.

Monitoring of the previous wellhead areas will be carried out by remotely operated vehicles (ROV) as required by regulation, but this scope of work can also be carried out from small work boats. Smaller vessels such as work boats will only need to comply with the same navigational rules as wind farm work boats and do not require extended navigational areas to work in.

3 REFERENCES

3.1 Development Consent Order References

RR-077 Relevant Representation of Spirit Energy Production UK Limited in Response to the S56 Notice, PIN Reference: EN010121, 19 August 2024.

REP1-116 Written Representation of Spirit Energy Production UK Limited, EN010121, Unique Reference: 20049981, 26 November 2024.

REP2-007 3.5 Development Consent Order: Schedule 3 Spirit and Harbour Protective Provisions Plan - Revision 01 (Volume 3). 12 December 2024.

REP3-035 5.2.17.2.1 Environmental Statement Appendix 17.2 Radar Early Warning System Technical Report - Revision 02 (Volume 5) (Tracked)v 22 January 2025

REP3-070 PIN Reference 9.43 Remaining Responses from the Applicants to Spirit Energy Deadline 1 Submissions – Revision 01 (Volume 9). 22 January 2025.

REP3-072 PIN Reference 9.43.2 Responses from the Applicant to Spirit Energy Deadline 1 Submissions Appendix B Effect of Proposed Morecambe Offshore Windfarm on Oil and Gas Operations – Revision 1 (Volume 9). 22 January 2025.

REP4-069 Deadline 4 Submission by Spirit Energy - Response to the Applicant's Deadline 3 Submissions, Reference: 20049981, 18 February 2025.

3.2 External References

[1] Offshore Installations (Offshore Safety Directive) (Safety Case etc.) Regulations, SI 2015/398, UK Parliament, 2015.

[2] Research Report 392: Wave Mapping in UK waters. UK Health & Safety Executive, 2005.

[3] Maintenance Backlog Measurement, Interpretation and Measurement Guidelines. OEUK, March 2022, Issue 02.

[4] The Offshore Installations (Prevention of Fire and Explosion, and Emergency Response) Regulations 1995, SI 1995/743.

[5] L154 - The Offshore Installations (Offshore Safety Directive) (Safety Case etc) Regulations 2015. Guidance on Regulations. Date of Publication 22/12/2015.