Hornsea Project 4: Harbour Energy Response to Secretary of State

Due 13 January 2023

Contents

1.0 Introduction

Following completion of the Development Consent Order Examination process for the proposed Hornsea Project 4 windfarm, on 16 December 2022, the Secretary of State for Business, Energy & Industrial Strategy requested an update from several affected parties. This document comprises Harbour Energy's response to the questions: "*Harbour Energy and the Applicant are asked to provide an update as to whether protective provisions are now agreed or what matters remain outstanding. In particular, Harbour Energy and the Applicant are asked to confirm whether protective provisions have been agreed that would secure the use of and compensate for any additional associated costs, potentially enabling the use of 800m-wide aviation access corridors and a smaller wind turbine exclusion zone as sought by the Applicant.*" This document also contains a concise summary of the rationale for Harbour Energy's position on matters that are not yet agreed with the Applicant.

2.0 Status of Protective Provisions and Matters that Remain Outstanding

2.1 Status of Protective Provisions

Protective provisions have not been agreed between Harbour Energy and the Applicant.

The concept of marine access for a rig to the Johnston wellheads has been accepted by the Applicant and the marine corridor as proposed in both the Applicant's proposed Protective Provisions (REP6-040 and REP7-089) and Harbour Energy's proposed Protective Provisions (REP6-049) are acceptable to Harbour Energy.

2.2 Status of Dialogue between the Applicant and Harbour Energy

Harbour Energy approached the dialogue with the Applicant (both pre-examination and during the examination) in a spirit of cooperation, recognising the need for our operations to coexist. Good progress was made prior to the start of the examination leading to Harbour Energy being "optimistic that a Coexistence Agreement may be entered into before the close of the Examination" (REP1-077). Constructive talks continued as reported in REP2-080, REP5-101, and REP6-049. By Deadline 7 of the examination it became clear that "despite the best efforts of the parties, the coexistence agreement will not be finalised before the end of the Examination." (REP7-100). Through the remainder of the examination process, whilst Harbour Energy maintained a dialogue with the Applicant, it appeared that the Applicant was unwilling to countenance a compensation mechanism for additional costs that would be incurred by Harbour Energy nor did the Applicant seem prepared to accept that its proposals for clear airspace around the Johnston wells would be insufficient to enable any North Sea helicopter operator to conduct flights.

Throughout these discussions Harbour Energy sought a mechanism that would limit the areas unavailable to the Applicant's windfarm whilst also recognising that Harbour Energy must not be prevented from safely fulfilling its licence obligations. Furthermore, restrictions on Harbour Energy's operations would result in Harbour Energy incurring additional costs and delays. In order to permit Harbour Energy to fulfil its licence obligation to maximise economic recovery, and to permit Harbour Energy to fulfil its legal duty to conduct decommissioning in a cost effective manner, would need to be compensated by the Applicant to achieve a more equitable distribution of the impacts of coexistence. As set out in Harbour Energy's Deadline 8 submission (REP8-026), Harbour Energy's proposed Protective Provisions are those that would result in a tolerable level of restriction to Harbour Energy's operations while still ensuring Harbour Energy is not prevented from fulfilling its licence and decommissioning obligations:

"In the spirit of seeking successful coexistence, and recognising the potential adverse impact of layout restrictions upon the generation efficiency of the proposed windfarm, Harbour Energy could accept Protective Provisions that have a lesser impact upon the Applicant's proposed operations, providing that:

- It would be possible for Johnston Field Operations to coexist with the proposed windfarm; and
- The Applicant provide Harbour Energy with appropriate compensation for any additional costs and delays that it would suffer to its Johnston Field operations".

By contrast, each of the Applicant's proposed Protective Provisions (REP6-040, modified in REP7-089, then reiterated and justified in REP8-015) would, as set out in Chapter 3.0 below, preclude aviation operations in the vicinity of the wells and thus prevent Harbour Energy from being able to fulfil its licence and decommissioning obligations. These obligations require Harbour Energy to undertake work with a drilling rig and such work would need to be supported by regular helicopter visits to the rig. With the Applicant's proposed protective provisions it would be impossible to undertake any well interventions or, more pertinently, impossible to decommission the Johnston field's subsea and sub-surface facilities given the Applicant's potential windfarm configuration and the proposed close proximity of wind turbine generators to the Johnston field facilities. The Applicant has sought to provide precedents from the Hornsea Project 1 and Hornsea Project 2 windfarms in support of its proposed Protective Provisions (REP8-089) but, as demonstrated in Harbour Energy's post-Deadline 8 additional submission (AS-049), in each case these precedents only involve two turbines closer than 2km to a helideck. Such isolated turbines would restrict access to/from the platform under certain wind directions but would not preclude aviation operations. These examples are very different to, and certainly not, as the Applicant suggests, analogous to the situation that could apply under the Applicant's proposed Protective Provisions and so do not support their proposed Protective Provisions.

2.3 Matters Outstanding

The single outstanding matter remains ensuring the provision of sufficient unobstructed airspace for safe aviation operations to and from drilling rigs working at either of the production wellheads. In order for Harbour Energy to fulfil its licence obligations, both in terms of ensuring maximisation of economic recovery from the Johnston field and executing the decommissioning of the field following cessation of production, rigs will be required to work at the production wellheads during the life of the proposed windfarm and require regular helicopter visits throughout this period.

The CAA published its *Policy and Guidelines on Wind Turbines* in 2012. Since that time considerable operational experience has been obtained. Accordingly, at the end of 2022, a working group was formed comprising the CAA and all of the North Sea helicopter operating companies. The scope of this workgroup is: "to discuss all aviation safety issues related to offshore windfarms/WTGs with the objective of generating proposals for additional material for CAP 764 and/or SPA.HOFO". Pending the conclusion of this work by the CAA, it is not possible for Harbour Energy to be certain whether some of the proposals contained within this document would be compliant with the CAA's revised CAP 764 Policy and Guidance or the CAA's Specific Approval for Helicopter Offshore Operations (SPA HOFO). In order that the outstanding matter between the Applicant and Harbour Energy is resolved in a way that is sustainable for the foreseeable future, we request that the Secretary of State obtains the relevant output from the aforementioned CAA workgroup and subsequent changes to applicable policy and guidance so that these can be taken fully into account in reaching his decision.

Harbour Energy has consulted with its aviation service provider, Bristow Helicopters, to seek to establish the minimum requirements for aviation operations at the Johnston field when within a windfarm and in proximity to wind turbine generators. Bristow Helicopters are an active member of the CAA workgroup referenced above. We understand that this group has met several times and has already formed a common view on some of the requirements pertinent to helicopter operations to and from a helideck in proximity to, but not within, a windfarm. Some of these decisions would, after construction of the windfarm, be relevant to aviation operations to/from a rig at one of the Johnston wellheads. It would appear however that, as yet, aviation

operations to and from helidecks located within, as opposed to at the edge of, a windfarm array (as a rig at either of the Johnston wellheads would be) have not been fully considered so some uncertainty remains concerning any additional limitations that may apply to such operations.

The differences in view on aviation space requirements between the Applicant and Harbour Energy arise almost entirely from the different sources of advice relied upon by each. There is an important distinction between what is physically (and legally) possible for an aircraft to do and what it is prudent for an aviation operator, who is accountable for the safety of its operations, to permit its pilots to do when carrying out routine passenger transport flights. The Applicant has been advised by a very experienced former military helicopter test pilot whom we recognise has an excellent knowledge of the capabilities of the aircraft being used for North Sea operations. Harbour Energy has relied on its helicopter service provider, Bristow Helicopters who are a very experienced global helicopter operator (and who have in turn consulted with other North Sea helicopter operators and the CAA) to advise on the practical limitations for safe operations in transporting personnel to and from its facilities on a routine basis.

3.0 Helicopter space requirements

3.1 Methodology

This chapter is fairly technical, so to aid the reader it may be helpful to set out the systematic approach taken.

- In Section 3.2, we clarify the scope of this work and set out a number of key premises.
- In Section 3.3, we consider the current situation, with no windfarm. This provides a baseline against which to compare potential scenarios following construction of the wind farm which are described in subsequent sections.
- In Section 3.4, we consider the space required to safely carry out approach, landing and take-off manoeuvres to/from a helideck on a rig positioned at one of the Johnston wells.
- In Section 3.5, we consider the impact on aviation operations of the Johnston field being located within a windfarm. In this section we assume that the wind turbines are positioned sufficiently far from the well locations that there would be adequate space for approach, landing and take-off in any direction.
- In Section 3.6, we explore the impact on aviation operations (in addition to those described in Section 3.5) of potential turbine positions that would have the effect of preventing flying to/from the Johnston field under certain wind directions but would not entirely prevent aviation operations.

Throughout these sections, the impact on aviation operations is determined by reference to a database of met-ocean observations from the nearby Ravenspurn North Field recorded at 10 minute intervals from 1 Jan 2013 to 10 Feb 2019[1].

3.2 Assumptions and Premises

The scope considered in this section is limited to helicopters used to support normal operations. These are governed by the regulations covering commercial air transportation (CAT). Separate rules govern search and rescue (SAR) aircraft. Harbour Energy is relying on the discussions between the Applicant and the Marine Coastguard Authority (MCA) to ensure that, in the event of need, its operations can still be supported by SAR services.

[1] This dataset has been shared with the Applicant and was used by them in preparing their Helicopter Access Report: (A5.11.1 Environmental Statement Volume 5 Annex 11.1 Offshore Installation Interfaces Part 2) (APP-087). Whilst a common dataset has been used, some minor differences in analysis methodology lead to a slight divergence in results between Harbour Energy and the Applicant.

The analysis is based upon the use of AW139 helicopters with a full payload. These are the aircraft currently in operation in support of oil & gas operations in the UK Southern North Sea and are chosen for their carrying capacity, overall performance and safety. Smaller aircraft, or the same aircraft with a reduced payload, could potentially operate within somewhat more restricted airspace, but the Applicant's proposed protective provisions would still preclude flights with any aircraft or payload as it would not be possible to establish a stabilised Final Approach Track as described in Section 3.4.3. It should also be noted that where smaller aircraft or reduced payloads can be used, more such flights would be required with a consequent impact on safety, costs and logistics.

Given the variety of units often quoted, for the convenience of the reader, all distances are here expressed in metres (denoted by m) or kilometers (km) with the units more commonly quoted (nautical miles – denoted nm or feet – denoted ') provided in parentheses.

The helideck on a drilling rig is located at the opposite end of the vessel from the rig. For the jack-up rigs likely to be used over the Johnston wells, this means that the helideck will typically be 100m from the well. Due to uncertainties concerning seabed conditions and hazards, it is not possible to pre-determine the orientation of the rig and therefore the direction of this offset. Indeed it is generally not possible to place a rig in the same orientation as any previous jack-up rig deployment. Accordingly, an additional 100m from the well location has to be allowed to the nearest obstacle.

3.3 Baseline: Flights with no windfarm (current status)

Currently, when a rig is servicing the Johnston field, flights will typically be required once or twice per day. These flights comprise, scheduled crew change flights and, more time critical, deliveries of equipment and personnel essential to the current status of the drilling operations. Flights can be undertaken during daylight or night, with good visibility or, when visibility is poor, using instruments. In low temperatures, when there is a potential for rotors icing, aircraft will fly at lower altitude to prevent icing occurring. Under very severe wind (greater than 30.867m/s (60knots)) and sea-state conditions (significant wave height greater than 6m), flights are not permitted. Apart from minor restrictions due to any obstacles on the rig (e.g. the drilling derrick) and nearby vessels, helicopters may currently take-off and land on an offshore installation in any direction which thus makes operations possible irrespective of the wind direction.

For operational reasons, nearly all flights are conducted within the hours of 06:00-22:00.

Using data over a period of 6 years from the nearby Ravenspurn North field, weather conditions permit flights within 06:00-22:00 an average of (by month):

Month	% of time, flights are available
January	97%
February	97%
March	96%
April	91%
May	83%
June	88%
July	86%
August	87%
September	90%
October	97%
November	97%

December	96%
Annual Average	92%

3.4 Space Required for Manoeuvres Within Windfarm

The three limiting factors in determining space required for aviation operations are:

- Circling descent
- Approach
- Take-off with one engine inoperable
- Missed Approach

Each of these will be considered in turn below. First, it is necessary to clarify the assumptions used with respect to instruments.

3.4.1 Instrument or Visual Navigation

Under poor visibility conditions, aircraft are able to navigate using instruments. Different limitations apply to instrument operations than to visual operations. One of the matters already agreed by the CAA workgroup is that all operations within a windfarm, or where a wind turbine generator is within 5556m (3nm) of a helideck, must be undertaken visually and are restricted to daylight conditions when there is good visibility (at least 5000m) and a sufficiently high cloudbase (at least 213m (700') and preferably above the highest rotor tip, which in the case of the proposed Hornsea 4 windfarm would be 370m (1214')). Harbour Energy's proposed protective provisions (REP6-049) sought an area of radius 5.6km (3nm) free from obstructions. This had the effect of placing the Johnston field outside of the windfarm array and ensuring that no wind turbine generators would be within 3nm. Accordingly instrument operations would be permitted. When flying on instruments a helicopter must at all times maintain a lateral separation of 1852m (1nm) from any obstacle. As a result, the space required for the manoeuvres described in the sections below would be greater. It is worth noting that the submissions made during the DCO examination by NEO Energy were based upon the space required for a take-off with one engine inoperable when flying on instruments.

Ideally, Harbour Energy would still prefer no wind turbine generators to be placed within 5556m (3nm) as this would keep the Johnston facilities outside of the windfarm and enable flying under a wider range of conditions, thereby having less impact upon Johnston operations. Recognising however that, unlike NEO's Babbage field which is a production facility regularly visited by helicopters, flights are only required to and from the Johnston field whilst a rig is deployed at one of the wellheads, the discussion below accepts that the Johnston field will probably be enclosed within the windfarm array and that there will be wind turbine generators within 5556m (3nm) of the helideck. Accordingly the below discussion assumes that all manoeuvres are conducted visually.

3.4.2 Circling Descent

If no aviation corridor is provided (refer to Section 3.5), helicopters will have to overfly the windfarm maintaining an altitude of at least 305m (1000') above the rotor tips and then descend by means of a circling descent in order to then execute an approach to the helideck as described in Section 3.4.3. At all times the helicopter must maintain a 152m (500') lateral clearance to any obstacle (rotor tips) (Commission Implementing Regulation (EU) No 932/2012 (the Standardised Rules of the Air Regulation)). This requires a cylinder of unobstructed airspace with a minimum of radius 1.8km (1nm) around and containing each wellhead. (Figure 1).

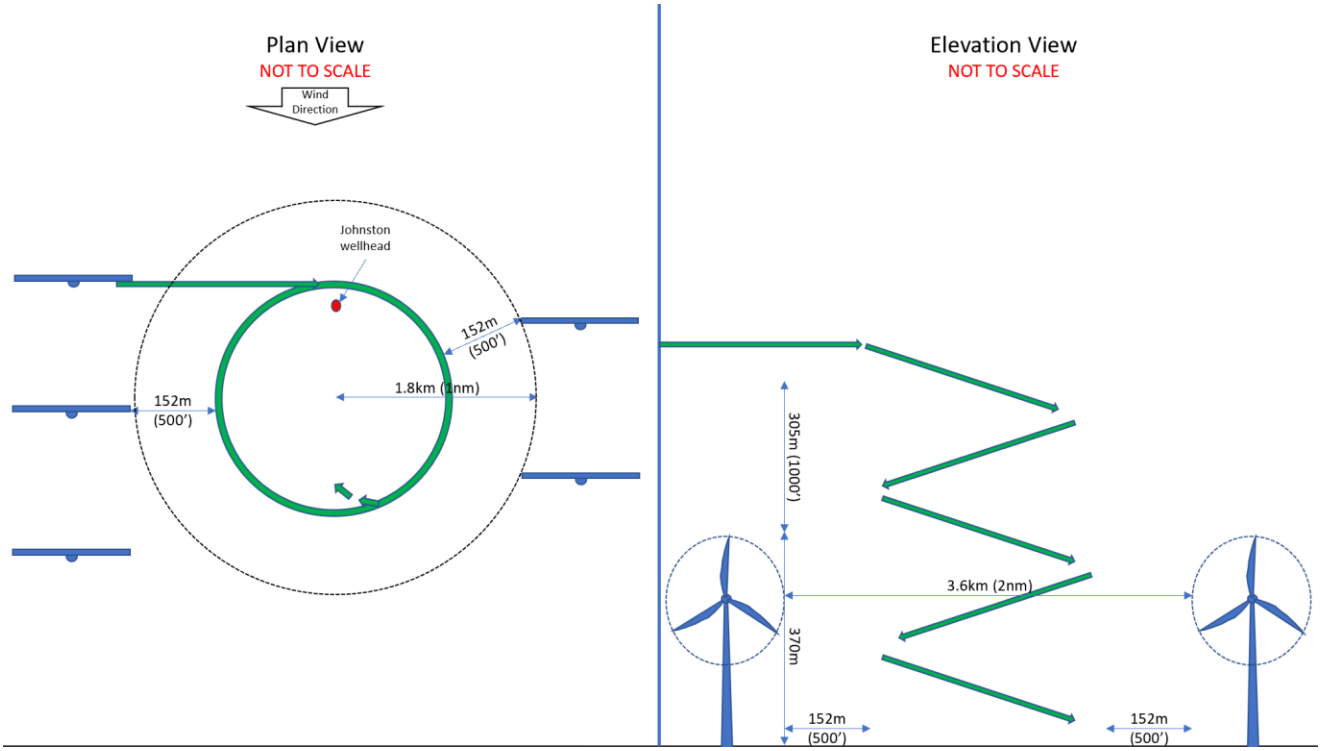


Figure 1: Circling Descent

3.4.3 Approach

We have been advised by Bristow Helicopters that all North Sea helicopter operators will shortly require aircraft to be on a stabilised Final Approach Track no less than 926m (0.5nm) downwind of the helideck. The principle of a stabilised approach is considered to be a key safety feature for offshore transportation of personnel by helicopter (c.f. Report 690 *Offshore Helicopter Recommended Practices*, 690-2 Section 32, published by International Association of Oil & Gas Producers). By being in a stabilised approach, the pilots are able to give full concentration to executing a safe approach and landing. In order to execute a turn into wind to establish the 926m (0.5nm) Final Approach Track whilst maintaining at least 152m (500') lateral clearance from the nearest obstacle, there must be no obstructions to airspace a minimum of 2.8km (1.5nm) and preferably, depending on the strength of the wind – which would elongate the turn onto the Final Approach Track, 3.7km (2nm) downwind of the helideck. Taking into account the 100m offset of the helideck from the well location, this means that an absolute minimum of 2.9km and preferably 3.8km of unobstructed airspace is required downwind of each well location. (Figure 2).

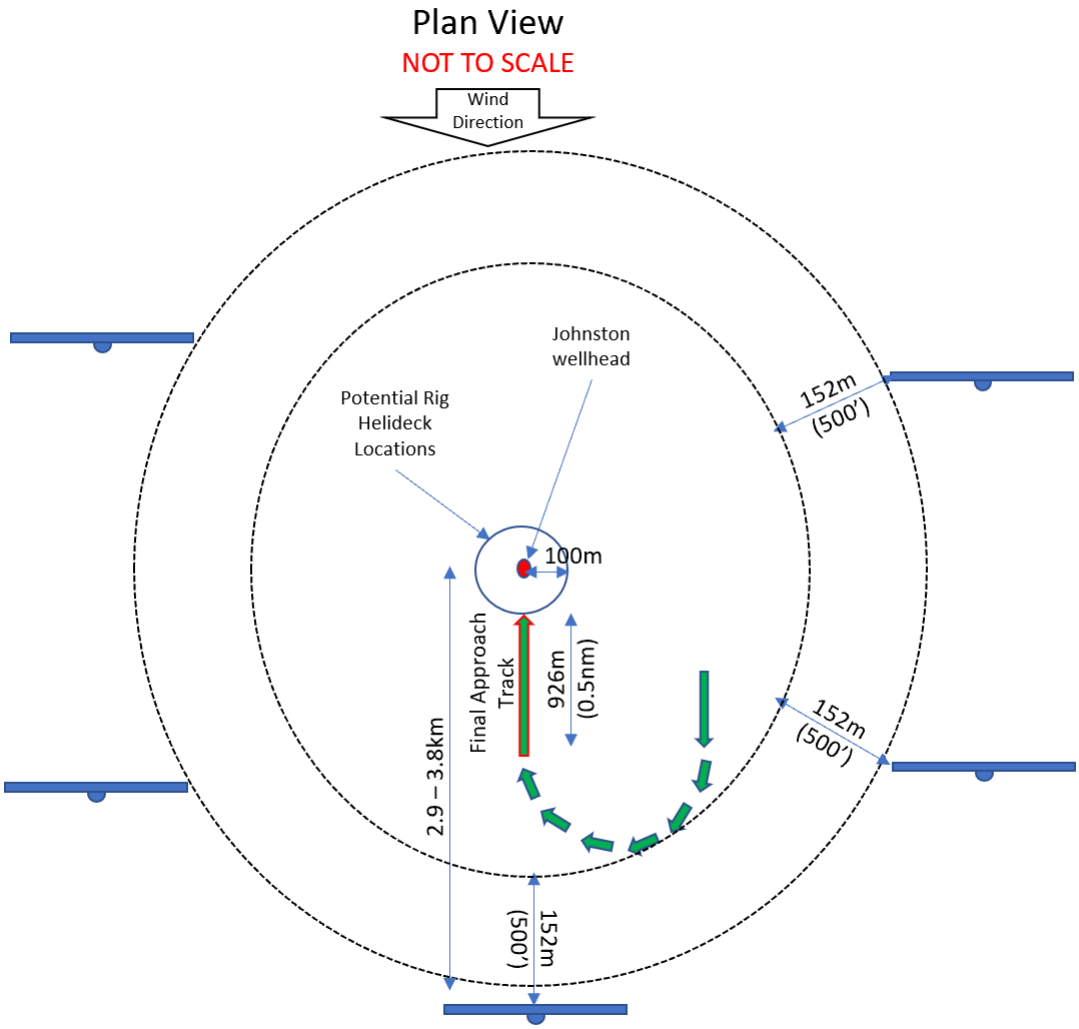


Figure 2: Approach

3.4.4 Take-off with One Engine Inoperable

In the event of an engine failure on take-off after the aircraft is committed to take-off, the take-off must be executed using only one engine. This is a relatively rare occurrence but one for which all pilots train regularly and which must be provided for when considering space requirements around a helideck. The aircraft is initially allowed to lose height from the helideck towards the sea in order to gain airspeed. The operable engine is then operated at full thrust for the maximum time permitted by the operation manuals before being throttled back to a sustainable level for the remainder of the climb. Ideally this manoeuvre would be executed in a straight line into the wind. In proximity to wind turbine generators a turn could be executed after the aircraft has reached about 152m (500'). The Planning Inspectorate's report following examination of the Hornsea Project 3 DCO concluded that:

"With regard to helicopter access to Chiswick and Grove platforms, we have concluded that a separation distance of 2.8nm is a sound basis for predicting the operational impacts of the Proposed Development."

The 5.2km (2.8nm) quoted here was the space required to execute a take-off with one engine inoperable at facilities located near the edge of a windfarm where flying on instruments would be possible. When flying on instruments, an aircraft must at all times maintain a lateral clearance of 1852m (1nm) from any obstruction. The calculation of the 5.2km (2.8nm) was in every other respect the same as would apply at Johnston, so we can simply subtract 1852m (1nm) and add the 152m (500') lateral clearance needed from all obstacles when flying visually to get an equivalent figure of 3.5km. Taking account of the 100m offset between helideck and well, we conclude that no turbine could be placed nearer than 3.6km upwind of each well location. (Figure 3).

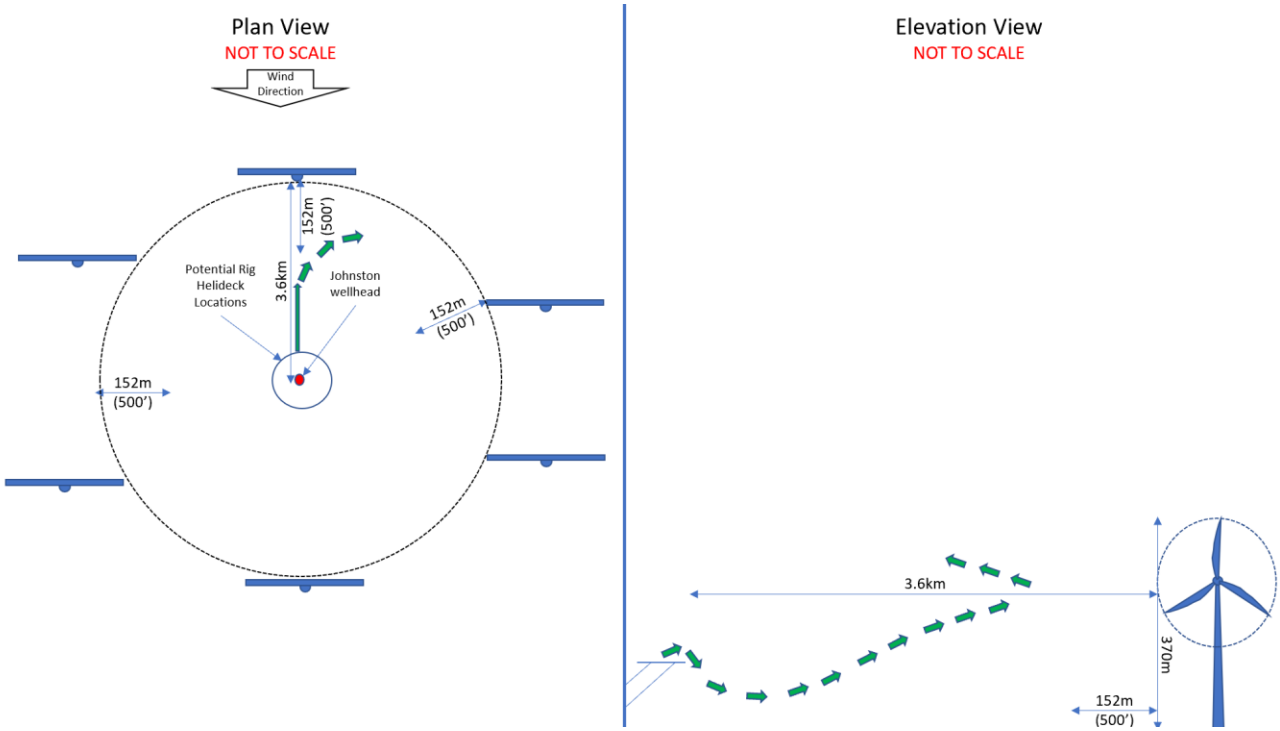


Figure 3: Take-off with One Engine Inoperable

3.4.5 Missed Approach

During an approach, when the aircraft is close to the helideck, the pilots make a final decision as to whether or not to continue to a landing. If they decide not to land, they execute a missed approach manoeuvre, climbing into wind away from the helideck. As this manoeuvre would normally be conducted with both engines operational, the rate of climb can be greater than that outlined for a take-off with one engine inoperable in Section 3.4.4 and so the manoeuvre can be executed within the 3.6km upwind of each well location required for a one-engine take-off.

Each of the above has been described in the context of the wind direction at the time. Wind direction in the vicinity of the Johnston wells is highly variable (Figure 4). In order for operations to be conducted irrespective of wind direction, there would need to be no obstructions to airspace (turbines or rotors) within a cylinder with a radius based on the largest of these distances – i.e. a radius of 3.6km and preferably 3.8km of each of the two Johnston production wellheads.

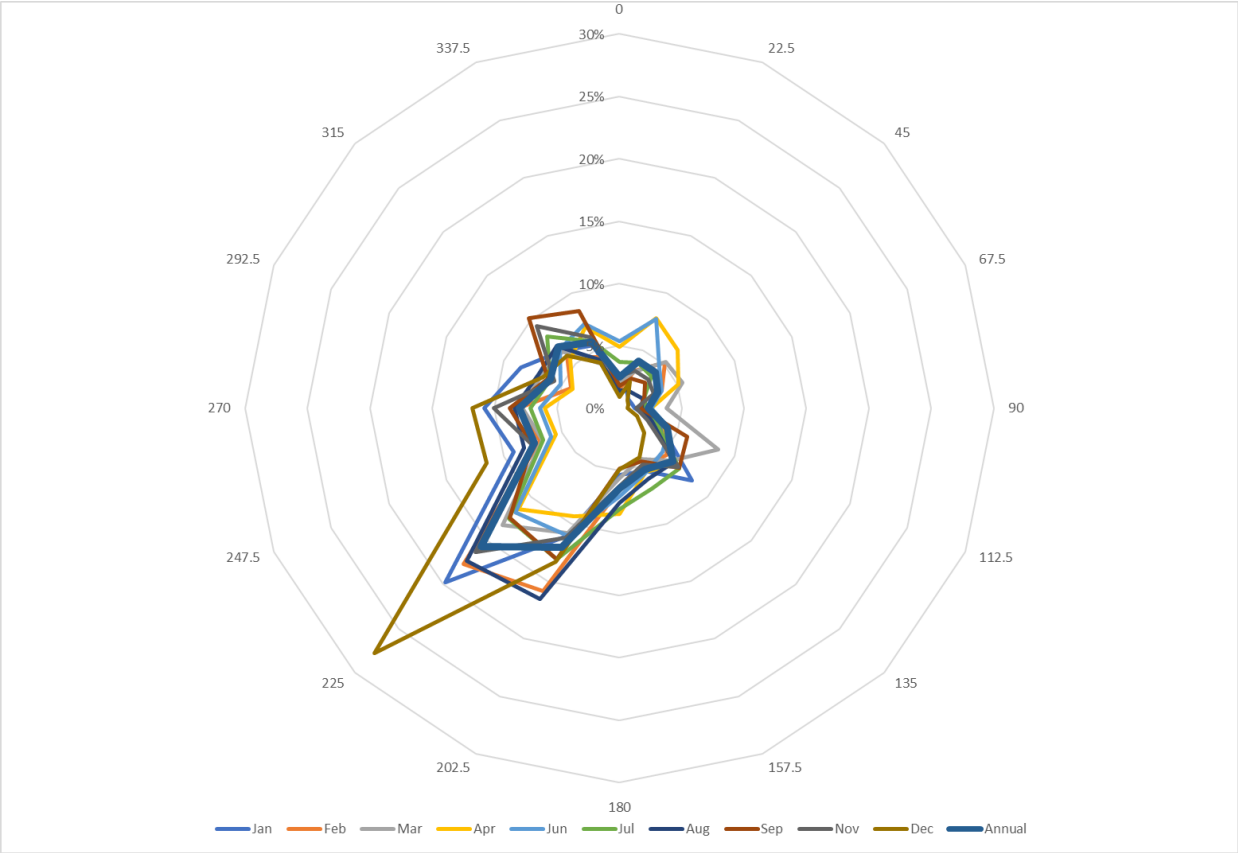


Figure 4: Wind Rose (% of time wind is from each direction)

3.5 Impact of Windfarm (Assuming Adequate Space for Manoeuvres)

Assuming that the wind turbines are placed to allow sufficient unobstructed airspace for aviation access to and from a rig (as set out in Section 3.4, this would be a radius of 3.6km around each wellhead), the presence of the windfarm will have two effects on aviation operations to and from the rig:

1. In conditions when icing would occur, the windfarm would prevent flying at lower altitude and so additional flights would be lost; and
2. Helicopter operators are agreed that where a wind turbine is within 5556m (3nm) of a helideck, flights must be restricted to daylight conditions with good visibility (5000m) and a sufficiently high cloudbase (at least 213.36m (700') and preferably above the highest rotor tip, which in the case of the proposed Hornsea 4 windfarm would be 370m (1214')).

These two restrictions would together reduce the average availability of flights (by month) to:

Month	% of time, flights are available
January	43%
February	53%
March	59%
April	70%
May	70%
June	78%
July	76%
August	74%
September	62%

October	58%
November	46%
December	41%
Annual Average	61%

Relative to the baseline in Section 3.3, this represents a reduction in the average availability of flights by 31% with a maximum reduction of 55% in December.

3.6 Impact of Wind Direction

In Sections 3.4.3, 3.4.4 and 3.4.5 we refer to obstacle-free distances required upwind and downwind of a helideck. To allow flights to occur irrespective of wind direction would, as we have stated at the end of Chapter 3.0, require unobstructed airspace in all directions within a minimum radius of 3.6km and preferably 3.8km. Were one or two wind turbine generators placed within this area, flights might still be possible except when the wind was in certain directions. By way of example we consider a configuration analogous to the precedents quoted by the Applicant shown in Figure 5. This placement of turbines would preclude flights when the wind is from directions within the two sectors marked, subtending a total arc of 45°.

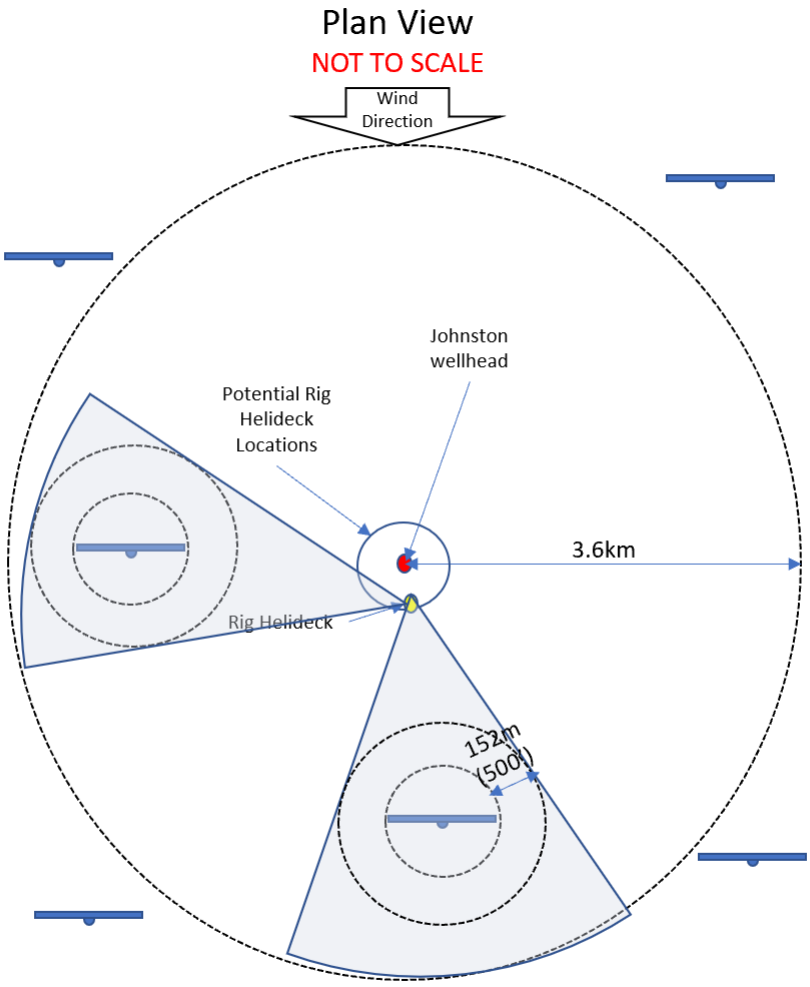


Figure 5: Illustrative Layout with two Wind Turbine Generators within 3.6km of of Johnston Wellhead

Such a restriction would reduce the average availability of flights (by month) to:

Month	% of time, flights are available
January	37%
February	45%
March	51%
April	62%
May	60%
June	67%
July	64%
August	63%
September	55%
October	53%
November	39%
December	35%
Annual Average	53%

Relative to the baseline in Section 3.3, this represents a reduction in the average availability of flights by 39% with a maximum reduction of 62% in December.

4.0 Suggested Compromise Solutions

In this chapter Harbour Energy sets out potential approaches to allowing the Applicant greater flexibility in the placement of its wind turbine generators whilst still (unlike the Applicant's proposed protective provisions) allowing Harbour Energy to fulfil its licence and decommissioning commitments. All but that set out in Section 4.4 have been the subject of constructive discussions with the Applicant prior to and during the DCO examination.

4.1 Deferred Installation

The anticipated overlap between Johnston field operations and the proposed windfarm is likely to be short relative to the anticipated life of the windfarm. Installation of any wind turbine generators within 3.6km of the Johnston wellheads could be deferred until after completion of Johnston field decommissioning. Advantages of this solution are that:

- following Johnston field decommissioning, the Applicant would be free to place its wind turbine generators in optimal locations
- the Applicant would have full control of the costs of implementing this solution

Harbour Energy recognise that this solution could introduce some additional costs to the windfarm development but such additional costs would have to be compared with the additional costs arising from alternative scenarios that permit coexistence (i.e. allow both the Applicant and Harbour Energy to conduct their respective operations) such as those discussed in the following sections.

4.2 Proposed Compensation Mechanism

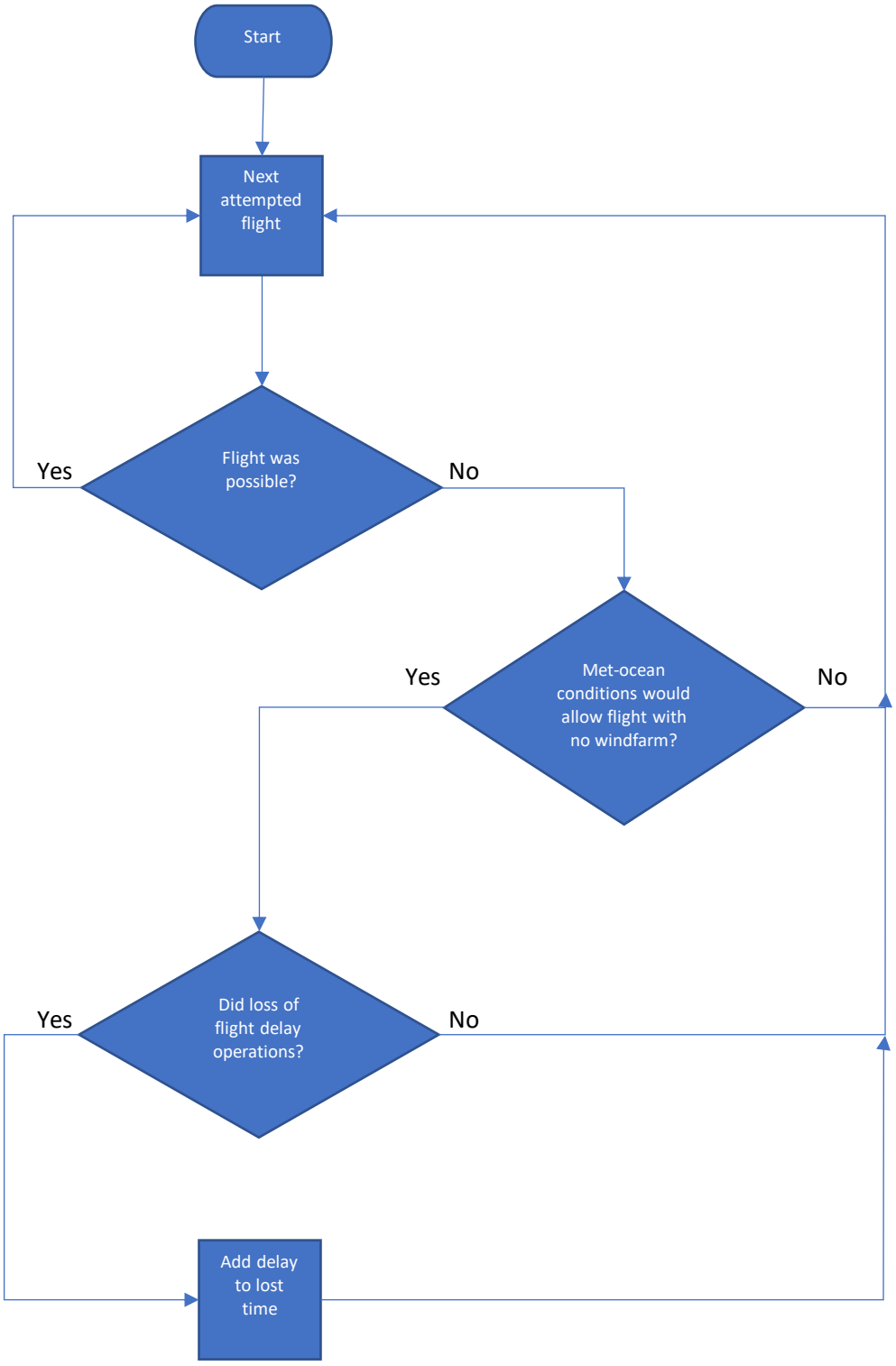
Harbour Energy recognised from an early stage that:

- Successful co-existence requires sufficient space around the Johnston wells to allow aviation and marine operations to be conducted safely.
- Provision of enough space to allow unrestricted aviation and marine operations around the Johnston wells would however restrict the Applicants proposed wind farm.

- Between these two limits there could be solutions that would allow marine and aviation operations to take place around the Johnston wells, whilst facilitating coexistence (i.e. allow both the Applicant and Harbour Energy to conduct their respective operations). It is anticipated that such solutions would place practical restrictions on aviation operations which would translate into additional costs for Harbour Energy.

It would be unreasonable were Harbour Energy to bear all such costs. As set out in Section 3.5, the very fact of there being a windfarm will preclude aviation operations under some conditions leading to an increase in costs. In order to promote coexistence (i.e. allow both the Applicant and Harbour Energy to conduct their respective operations), Harbour Energy would be prepared to accept these additional costs. Any further costs arising from space limitations would however need to be compensated by the Applicant. Accordingly Harbour Energy proposed to the Applicant a simple and practical method of determining the delays that actually occur as a result of the windfarm and determining a compensation amount. With a compensation mechanism like this, a range of solutions that facilitate coexistence (i.e. allow both the Applicant and Harbour Energy to conduct their respective operations) become available, some of which are set out in the following sections. To be clear, a compensation mechanism is only applicable where sufficient unobstructed space is available around the Johnston wells to permit some flights to and from a rig at either of the Johnston wells.

The compensation mechanism proposed considers operations over a period of time (e.g. the previous month) and on every occasion that a flight critical to the operation was not possible, examines whether this was a result of the presence of the wind turbine generators (i.e. would the flight have occurred were the windfarm not there?). In this way the total time lost to the rig operation can be recorded. It should be noted that, whilst many flights may be delayed, only those critical to the operation and thus those resulting in extension of the overall rig deployment would be counted in this mechanism. The total time lost to the rig operation would then be multiplied by an overall spread rate, such as that shown in Harbour Energy's post-examination submission (AS-049), to arrive at a compensation amount for that period.



4.3 Aviation Corridor

In Section 3.5 it was noted that the presence of the windfarm would:

1. Under certain conditions (icing) make it impossible to fly over the windfarm to reach the Johnston facilities; and

2. Restrict flights to daylight conditions with good visibility and a high cloud base.

The first of these could be avoided by providing a corridor through the windfarm to the vicinity of the helideck. Harbour Energy's proposed protective provisions (REP6-049) sought an obstacle-free aviation corridor of width 1000m. Such a corridor would however be entirely contained within the 5.6km (3nm) clear airspace also sought around each Johnston wellhead. Following discussions with Bristow Helicopters that suggested a 1000m corridor would be too narrow, Harbour Energy increased the width of the proposed aviation corridor in its post-examination additional submission (AS-049) to 1400m. There is still considerable doubt as to whether helicopter operators would consider flying through this corridor as it is not a straight line and has a total length of about 13km (7nm). An aircraft entering the corridor would not have line of sight to its destination at the further wellhead. The current edition of CAP764 recommends that Helicopter Main Routes be at least 3.7km (2nm) wide however it does not specify a width for flight corridors to facilitate access to offshore installations stating only:
"Such corridors should be oriented in line with the prevailing wind direction, and their width should be designed in consultation with the helicopter operators, given that it will be governed by the VFR performance of the aircraft in use."
The appropriate width of the aviation corridor will thus need to be determined when the revised policy and guidance in CAP764 is available.

In the spirit of aiding the Secretary of State in arriving at a decision that both facilitates coexistence and permits each party to safely fulfil its relevant licence/lease obligations, Harbour Energy proposes that, subject to:

- sufficient obstacle-free airspace (as described in Section 3.4.2) being provided to allow aircraft to make a circling descent after overflying the windfarm to the vicinity of the wellheads; and
- the impact of lost flights when icing conditions preclude flying over the windfarm being included in an appropriate compensation amount/mechanism such as that set out in Section 4.1,

then the requirement for an aviation corridor can be removed from any protective provisions for the benefit of Harbour Energy.

4.4 Wind Turbine Generators within 3.6km of Helideck

The fact that the Applicant is not yet able to propose specific locations for its wind turbine generators nor confirm the size of such turbines and that the DCO process relies upon the *Rochdale envelope* planning approach has led Harbour Energy to require no wind turbine generators or turbine blades to fall within a 3.6km or preferably a 3.8km radius of either wellhead location. The analysis presented in Section 3.6 demonstrated that this may be overly restrictive. Subject to implementation of a compensation mechanism such as that set out in Section 4.1, protective provisions could be applied that would allow up to two wind turbine generators to be placed within 3.6km of the Johnston wells provided that the wind directions that would be unavailable for approach, landing and take-off do not exceed a total of 45 degrees.

5.0 Policy Considerations

Harbour Energy notes the Applicant's comments under the heading Legal and policy position (section 4) in their Deadline 7 submission (REP7-089). Harbour Energy has a legal duty to maximise the economic recovery of fossil fuels from its licences in the UK and thereafter decommission in a cost-effective manner. In line with the Secretary of State's desire for ongoing investment in home-grown energy to protect the UK, gas production from fields – including the Johnston field, play a vital part in the UK's energy security to offset cessation of gas imports from Russia.

Harbour Energy is mindful of the twin obligation of assisting the Secretary of State in meeting the UK's Net Zero targets, and also the importance of industry continuing to deliver on commitments under the North Sea Transition Deals. The Applicant's statements imply that renewable energy can replace fossil fuels and suggest that the Examining Authority prioritise the needs of wind generation over gas extraction. The reality is that, until such time as there are more effective means of electricity storage, fossil fuels are required to back up renewable electricity during periods of low generation so coexistence of the two industries is required.

6.0 Conclusions

1. Harbour Energy has a legal duty to maximise the economic recovery of fossil fuels from its licences in the UK and thereafter decommission in a cost-effective manner. Harbour Energy also recognises the need to invest to meet the UK's Net Zero targets. Accordingly Harbour Energy is committed to working in a manner that promotes the coexistence of its offshore oil & gas operations with those of the offshore renewables industry. Harbour Energy's approach to engaging with the Applicant has consistently applied these principles and Harbour Energy is disappointed that, despite our putting forward a range of practical proposals, the Applicant was unable to reach agreement with Harbour Energy on a cooperation agreement.
2. The applicant's proposed protective provisions would preclude aviation operations to/from the Johnston field such that decommissioning would not be possible once the windfarm is constructed.
3. The marine corridor in both Harbour Energy's (REP6-049) and the Applicant's (REP6-040 and REP7-089) proposed protective provisions is agreed between the Applicant and Harbour Energy and is still required to enable rig access to the Johnston wells.
4. The CAA is in the process of updating its Policy and Guidelines on Wind Turbines (CAP764) and potentially also its Specific Approval for Helicopter Offshore Operations (SPA HOFO). We request that the Secretary of State base his decision upon the CAA's revised position following conclusion of the CAA's current work.
5. Based on advice from Harbour Energy's helicopter service provider, in order for Harbour Energy not to be significantly impacted by the windfarm, protective provisions would be required that maintained an area of radius 3.6km around each wellhead. Harbour Energy has however put forward proposals that would enable coexistence (i.e. allow both the Applicant and Harbour Energy to conduct their respective operations) and increase the Applicant's flexibility in placing wind turbine generators. The primary mechanism to facilitate most of these solutions would be compensation by the Applicant based on actual losses incurred during rig operations. Compensation is necessary in order to share the burden of coexistence more equitably.
6. In addition to provision of a 1km wide marine corridor along the route of the pipeline that is free of surface infrastructure, Harbour Energy favours the following aviation solutions (in order of preference) to facilitate coexistence (i.e. allow both the Applicant and Harbour Energy to conduct their respective operations):
    a. No wind turbine generators or rotors placed within 5.6km (3nm) of the Johnston wellheads until after the Johnston field has been decommissioned.
    b. No wind turbine generators or rotors within an aviation corridor (the width of which would be determined by minima set out in the CAA's revised CAP764) along the pipeline route and no wind turbine generators or rotors within 3.6km of either Johnston wellhead.
    c. Option b but with any wind turbine generators to be placed within 3.6km of the Johnston wellheads installed by the Applicant **after** completion of Johnston field decommissioning.
    d. **Subject to compensation by the Applicant** for the increased costs of rig programmes arising from flight restrictions due to the presence of wind turbine generators, such as proposed in Section 4.2, **and** subject to aviation operations still being permitted to/from the Johnston field under any new CAA policy and guidance:

i. Option b but with no requirement for an aviation corridor.
ii. Option b or d(i) but with up to two wind turbine generators able to be placed within 3.6km of the Johnston wells as long as the wind directions that would be unavailable for approach, landing and take-off do not exceed a total of 45 degrees.