



Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

The Applicant's Comments on Perenco UK Limited's Deadline 7 Submission

Revision A

Deadline 8

July 2023

Document Reference: 22.32

Title:	
Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects Examination submission The Applicant's Comments on Perenco Deadline 7 Submission	
PINS document no.: 22.32	
Document no.: C282-EQ-Z-GA-00069	
Date:	Classification
July 2023	Final
Prepared by:	
Equinor	
Approved by:	Date:
Tom Morris, Equinor	July 2023

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1 The Applicant's Comments on Perenco UK Limited's Deadline 7 Submission

1. This document presents the Applicant's comments on Perenco's Deadline 7 submission.

Table 1 The Applicant's Comments on Perenco's Deadline 7 Submission [Submission ID: 18365]

ID	Perenco Comment	Applicant Response
1	<p>Perenco and the Applicant have agreed the need for PP's to provide a corridor free from surface infrastructure 500m either side of the Durango to Waveney pipeline. Perenco has advised the Applicant that no adverse impact on line of sight communications is anticipated. Given the criticality of line of sight communications, Perenco expects that the Applicant will have an obligation to ensure no adverse impact occurs as a result of the authorised development. As set out in Perenco's written summary of oral evidence at ISH7, Perenco and the Applicant disagree regarding the space required to ensure operations at Waveney can be conducted such that: negative impacts to offshore infrastructure and activity are minimised; risks to infrastructure and activity are as low as reasonably practicable (ALARP); and adverse effects on safety are minimised. Accordingly, Perenco propose the attached Protective Provisions</p>	<p>The Applicant has noted the submission of Protective Provisions by Perenco. The notable difference to the Protective Provisions submitted by the Applicant at Deadline 7 (see Part 15 of Schedule 14 of the draft DCO (Revision J) [document reference 3.1]) was the distance.</p> <p>The Applicant has submitted updated Protective Provisions for the benefit of Perenco at Deadline 8 increasing the radius of the provisions surrounding Waveney from 1.01nm to 1.26nm. (See Part 15 of Schedule 14 of the draft DCO (Revision K) [document reference 3.1].)</p>

Table 2 The Applicant's Comments on Perenco's Deadline 7 Submission: Summary of Perenco's Oral Evidence Concerning Aviation (Helicopter) Impacts at ISH7

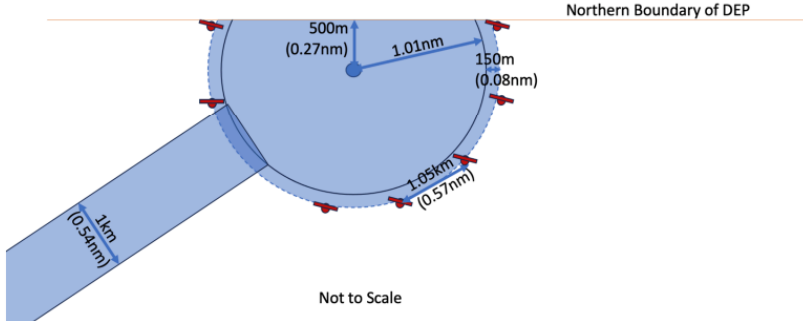
ID	Perenco Comment	Applicant Response
1	Perenco North Sea Limited (PNSL) relies on helicopter access to the Waveney Installation for both routine operational matters and emergency evacuations (excluding search and rescue operations). Helicopters conducting such operations are governed by the regulations covering commercial air transportation ("CAT"). The helicopters currently used by PNSL are the Augusta Westland type AW139.	Noted.
2	Helicopter visits are required to carry out essential maintenance work to ensure the safety of the asset and efficient operations and production. Whilst an alternative method of accessing the Installation using "walk to work" vessels is available within the business, the response time in the event of unplanned production shutdown is much longer and as a result there would be reductions in annual production. The combination of reduced production revenues, higher operating costs (therefore lower margins) could render the remaining production uneconomic and lead to an early cessation of production. Such an outcome would be contrary to maximising economic reserves (MER), under Petroleum Act 1988.	Noted.
3	Helicopter visits are required to support decommissioning activities that utilise a non-production installation (NPI). The presence of the windfarm will restrict helicopter operations, extending the duration of decommissioning activities, leading to significant increased costs, which need to be taken in to account when determining the economic life of the Waveney Field. The increased decommissioning costs could lead to an early cessation of production. Again, such an outcome would be contrary to maximising economic reserves (MER), under Petroleum Act 1988.	Noted.
4	To address these impacts, the Applicant has proposed a minimum distance between the Waveney Installation and the Durango Well and any wind turbine (measured to base of turbine) of 1.01nm. PNSL does not agree with the Applicant that this is an acceptable minimum distance for the reasons set out below and instead proposes a minimum distance within PNSL's Draft Protective Provisions of 3.00nm.	<p>The Applicant has not provided any additional protections for the Durango well which is in excess of 3nm from DEP-N and note that neither do the form of Protective Provisions provided by Perenco.</p> <p>The Applicant included a 1.01nm provision for the Waveney platform at Deadline 7, but has increased this to a 1.26nm facilities proximity area in</p>

ID	Perenco Comment	Applicant Response
		the updated Deadline 8 Protective Provisions (see Part 15 of Schedule 14 of the draft DCO (Revision K) [document reference 3.1]).
4.1 Compliance with National Policy Statement EN3		
5	<p>i. The proposed Development cannot be said to minimise negative impacts on other offshore infrastructure or activity. As has been demonstrated by both the Applicant and PNSL, negative impacts (loss of suitable periods in which flights may take place) increase as wind turbine rotor tips are placed closer to the installation with step changes at 3nm and 1.26nm (or in the Applicant's view 1.01nm). It is PNSL's view that a minimum distance of 3nm is required to minimise the negative impact on the Waveney Installation and the ability to decommission the Durango Well. However, as Mr Sanders stated in ISH7, PNSL would be amenable to a commercial arrangement which provides compensation for economic losses (arising from a level of negative impacts) for a minimum distance of 1.26nm which could meet the requirement to minimise negative impacts.</p>	<p>NPS EN3 (2.6.183) states that the decision maker should employ a 'pragmatic approach' in these situations and should expect the '<i>applicant to minimize negative impacts and reduce risks to as low as reasonably practicable</i>'. In recognition of this, the Applicant has entered into extensive engagement with Perenco to resolve their concerns. The Applicant notes that when it consulted at PEIR stage, it proposed an initial buffer of 500m which it subsequently increased to 1.nm upon submission of the DCO application (as shown on the Works Plans (Offshore) (Revision D) [document reference 2.7]) and most recently to 1.26nm through the Protective Provisions included at Part 15 of Schedule 14 of the draft DCO (Revision K) [document reference 3.1], which has all been achieved through ongoing discussions with Perenco and expert engagement.</p> <p>The application of a 1.26nm buffer further mitigates the potential negative impacts on Perenco by reducing risks to as low as reasonably practicable. Increasing the buffer any further, whether that be 1.5nm or 3nm would make no material difference to % of available access time as IMC flights would still be lost; but it would have an unacceptable detrimental impact on the area available for the development of DEP-N, fundamentally affecting the viability of DEP (as shown in Figure 1 of this document). Both parties agree that beyond 1.26nm that IMC access is lost and there is no mitigation for this through turbine layout (see Appendix A.7 of Supporting Documents for the Applicant's Responses to the Examining Authority's Fourth Written Questions [document reference 21.5.1]).</p> <p>Appropriate mitigation to minimise disruption and economic loss is secured by the inclusion of a 1.26nm buffer in the Protective Provisions included within the draft DCO Part 15 of Schedule 14 of the draft DCO (Revision K) [document reference 3.1]. Whilst the Applicant will continue engaging with Perenco, a commercial agreement between Perenco and</p>

ID	Perenco Comment	Applicant Response
		<p>the Applicant prior to the close of examination is not necessary to reach the conclusion that the Applicant has complied with the relevant policy position set out in NPS EN-3.</p> <p>On this basis and as set out further below, the Applicant considers that the ExA can be satisfied that <i>“the site selection and site design of the proposed offshore wind farm has been made with a view to avoiding or minimising disruption or economic loss or any adverse effect on safety to other offshore industries”</i> in accordance with paragraph 2.6.184 of NPS EN3 and can recommend consent and the SoS can equally grant consent on this basis. In considering this point the Applicant highlights the NPS EN-3 supports the pragmatic co-existence of offshore wind farms and oil and gas installations. The proposed 3nm distance advocated by Perenco is clearly at odds with this policy given the fundamental affect it has on the available area for turbines in the DEP-N area, and the viability of DEP (as shown in Figure 1 of this document).</p>
6	<p>ii. As currently proposed, the Development cannot be said to reduce risks to other offshore infrastructure or activity to as low as reasonably practicable as, based on PNSL’s analysis, with wind turbine rotor tips at 1.01nm, the Waveney installation would become uneconomic to operate. A modest increase in airspace with wind turbine rotor tips no closer than 1.26nm would allow operations to continue with some economic losses, however this would require a commercial arrangement which has not, to date, been agreed between the Applicant and PNSL. As such, PNSL’s position is that a minimum distance between the Waveney Installation and the Durango Well and any wind turbine (measured to base of turbine) of 3.00nm is required.</p>	<p>Both parties agree that beyond 1.26nm that IMC access is lost and there is no mitigation for this through turbine layout (see Appendix A.7 of Supporting Documents for the Applicant’s Responses to the Examining Authority’s Fourth Written Questions [document reference 21.5.1]).</p> <p>The impact at 1.26nm is minimal, even accommodating with Perenco’s change of operator and their greater stabilisation distance. All mitigation available to the Applicant has been put in place and therefore we meet the policy test to <i>“work with the impacted sector to minimise negative impacts and reduce risks to as low as reasonably practicable”</i> (EN3 paragraph 2.6.183, repeated in paragraph 3.8.362 of the March 2023 draft NPS EN-3) and that whilst we have some disagreement with Perenco about the economic impact, both agree that we will not <i>“affect the future viability or safety of an existing or approved/licensed offshore infrastructure”</i> (NPS EN-3 paragraph 2.6.185, repeated at paragraph 3.8.365 of the March 2023 draft NPS EN-3) as Perenco have put forward that at 1.26nm they would not be required to close production at Waveney.</p>

ID	Perenco Comment	Applicant Response
		<p>Both the Applicant and Perenco agree an impact will be loss of access during IMC conditions (minus no-fly conditions). Based on historic metrological data provide by Perenco this equates to 4.6% in 2020, 4.8% in 2021 and 2.2% in 2022 under the new stricter CAA rules.</p> <p>The Applicant therefore consider the use of a 20% restriction put forward by Perenco in their economic assessment an over estimation of the impact.</p> <p>The Applicant's analysis is based on actual flight access to the platform, and represents days on which Perenco chose to fly, rather than applying hypothetical weather windows. This analysis is provided in Environmental Statement (ES) Appendix 16.1: Helicopter Access Study [APP-205].</p> <p>From this analysis we see that 2 out of 72 flights would have been affected in 2020 and only 1 out of 64 in 2021. There were sufficient times on each of these occasions for flights to either be brought forward or delayed, effectively mitigating in full any impact on platform operations. Loss of working time would have been 2 hours and 22 minutes across the two years of flight access.</p> <p>It has not been justified or substantiated by Perenco how a very limited loss of access time of an hour or two a year could lead to loss in the range of £2.9-£8.8 million over a period after 2025 Deadline 6 (D6) Submission – Indicative Economic Assessment [REP6-037].</p> <p>This claim seems disproportionately high, especially as Woodmac market intelligence (being the industry-leading oil & gas industry research firm) suggest in their analysis that the Waveney platform / field is at the end of its economic lifetime and uneconomic after 2025 using recently updated market and economic assumptions.</p> <p>Even when applying a favourable production decline curve and assuming a long-term sustained high gas price of 110p/therm from 2025 onwards, the Waveney platform would not create a total post-tax cashflow of more than £0.5 million per year after 2025. Beyond 2031 the Waveney platform,</p>

ID	Perenco Comment	Applicant Response
		<p>even with these very optimistic assumptions, would become uneconomic and would be shut-in for decommissioning.</p> <p>A claim of several millions as made by Perenco, assessed to be higher than the total post-tax cash flows after 2025 earned by Perenco from the Waveney platform, whilst using very favourable assumptions, does not represent in the opinion of the Applicant a true and proportionate compensation claim for losses caused by a very limited loss of access time due to the windfarm.</p>
7	<p>iii. The proposed Development does not avoid or minimise any adverse effect on safety for other offshore industries. Helicopter Operators have a duty to only fly Commercial Air Transport (CAT) operations if it is safe to do so. Consequently, passengers and crew should not be subjected to greater safety risk, instead flights will just not be undertaken. The Applicant's insistence that the space required around a helideck for helicopter operations should be based on the minimum that meets the current legal limits (0.5nm) with no additional safety margin, could lead to a higher chance of an incident. Should such an incident indicate that more space is required, the impact will be an inability to support future operations. The majority of Helicopter Operators' operations manuals do not set flight parameters at the absolute minimum limit for "day in day out" operations.</p>	<p>The Applicant has included Protective Provisions for the benefit of Perenco at Part 15 of Schedule 14 of the draft DCO (Revision K) [document reference 3.1] which include a 1.26nm facilities proximity area for the Waveney platform which is sufficient for the increase in stabilisation distance that Perenco's operator will use when they change from Bristow to Bond in 2024.</p> <p>It must be noted that 0.5nm is the distance being used at Waveney at the present time by helicopter accessing the platform. This is not at the insistence of the Applicant, but a statement of fact regarding the baseline helicopter operations at Waveney.</p>
<p>4.2 Wind Turbine Layout</p>		
8	<p>The Applicant noted that the minimum wind turbine spacing is 1.05km and that there will be a 1km (0.54nm) wide corridor free from surface infrastructure along the route of the pipeline from the Durango Well to the Waveney installation. It was suggested that these intrinsic protections may be sufficient. If one turbine base is placed 150m (0.08nm) from the proposed 1.01nm radius then the next turbine (at 1.05km [0.57nm] spacing) could be placed 30deg further around the 2.02 km or 1.09nm (=1.01nm + 150m [0.08nm]) circle around the installation. With no wind turbines in the 1km (0.54nm) wide pipeline corridor, this would still in theory allow the installation to be encircled by up to 11 wind turbines all with bases 2.02km (1.09nm) away (see sketch below). It is clear therefore</p>	<p>The sketch provided by Perenco shows seven turbines, not eleven. Regardless, the layout shown would not meet the MGN 654 requirement for lines of orientation and therefore could not be considered a realistic scenario.</p> <p>The Applicant notes that in another submission by Perenco they have quoted this distance at 1.32nm, not 1.34nm (see [REP6-036]).</p> <p>The Applicant also notes that Perenco state in their response to Q4.21.1.1 that "<i>Perenco accepts that an OEI take-off could be executed with wind turbine rotor tips no nearer than 1.26nm from the helideck</i>".</p>

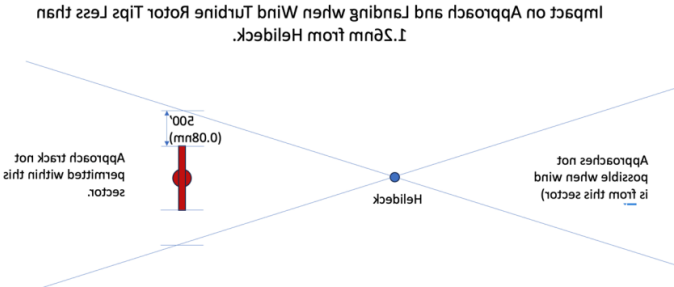
ID	Perenco Comment	Applicant Response
	<p>that these intrinsic protections are insufficient for PNSL when PNSL's Helicopter Operator requires a minimum of 1.26nm from the nearest wind turbine rotor tip to effect an approach/landing and a minimum of 1.34nm to the nearest wind turbine rotor tip for an one engine inoperable (OEI) take-off (c.f. Summary of Oral Submission at ISH6 – REP3-154).</p> 	<p>The Applicant has included Protective Provisions for the benefit of Perenco at Part 15 of Schedule 14 of the draft DCO (Revision K) [document reference 3.1] with a radius of 1.26nm from the Waveney platform which satisfies Perenco's requirement for OEI take-off as confirmed above.</p>
<p>4.3 OEI Take-off</p>		
<p>9</p>	<p>During ISH7, PNSL was asked to clarify the distance required for OEI take-off. The minimum distance with a full payload and assuming a turn at 500' (rather than the preferred turn at 1000') is (as stated in Summary of Oral Submission at ISH6 – REP), 1.34nm to wind turbine rotor tip. Given that it is understood that the turbines will not form a solid wall but will be spaced at a minimum of 1.05km (0.57nm) from one another, PNSL accepts that a distance less than 3.00nm may be sufficient but not 1.01nm as requested by the Applicant</p>	<p>The Applicant notes that in another submission Perenco have quoted this distance at 1.32nm (see [REP6-036]).</p> <p>The Applicant also notes that Perenco state in their response to Q4.21.1.1 that "<i>Perenco accepts that an OEI take-off could be executed with wind turbine rotor tips no nearer than 1.26nm from the helideck</i>".</p> <p>The Applicant has included Protective Provisions for the benefit of Perenco at Part 15 of Schedule 14 of the draft DCO (Revision K) [document reference 3.1] with a radius of 1.26nm from the Waveney platform which satisfies Perenco's requirement for OEI take-off as confirmed above.</p>
<p>4.4 Stabilised Approach</p>		
<p>10</p>	<p>PNSL agrees with the Applicant that the current regulations require a minimum of 0.5nm stabilised approach. We understand that Bristow Helicopters is the only North Sea helicopter operator to use a stabilised</p>	<p>Perenco's current operator is Bristow, who currently use a 0.5nm stabilisation.</p>

ID	Perenco Comment	Applicant Response
	<p>approach of 0.5 nm in their operations manuals. PNSL's current helicopter operator requires a longer stabilised approach for routine operations. As we understand it, this is the same for all other operators operating in the North Sea other than Bristow Helicopters. As PNSL noted at ISH7, the fact that something is legal (e.g. a 70mph speed limit) does not mean that it is safe or prudent to operate that that limit in all circumstances.</p>	<p>The Applicant is not suggesting that 0.5nm should be used in all circumstances, but the fact that it is currently being used safely by Perenco's current helicopter operator means it can be safe.</p> <p>Regardless, to accommodate Perenco's change in operator, the Applicant has increased the radius for the Waveney platform from 1.01nm to 1.26 nm which is secured through the Protective Provisions for the benefit of Perenco at Part 15 of Schedule 14 of the draft DCO (Revision K) [document reference 3.1].</p>
<p>4.5 Methodology of two flights within a day to NUI</p>		
11	<p>At ISH7, the Applicant was asked to comment on whether their methodology considered the requirement for two flights within a day to a NUI, with sufficient time between them to undertake work. Mr Prior, on behalf of the Applicant, responded that their methodology was robust and had not been challenged by PNSL. Whilst PNSL broadly agree with the methodology and results of the Applicant's determination of visual meteorological conditions (VMC), instrument meteorological conditions (IMC) and no fly days, PNSL's submissions at DL1 (REP1-156) and DL6 (REP6-036) challenge the Applicant's methodology with respect to flights to the Waveney installation.</p>	<p>As outlined in the Joint Position Statement (see Appendix A.7 of Supporting Documents for the Applicant's Responses to the Examining Authority's Fourth Written Questions [document reference 21.5.1] there is minimal difference in the outcome of the analysis, however, the Applicant's analysis does highlight possibilities of re-scheduling, as typically flights have been undertaken on good weather days.</p>
<p>4.6 Timing of flights</p>		
12	<p>At ISH7, Mr Prior, speaking on behalf of the Applicant, suggested that most flights to an NPI would occur in the middle of the day, so even in winter the loss of night flying would have a smaller impact than calculated. This statement is incorrect. During winter months, flights to a normally unattended installation (NUI) with daylight only rated helidecks must be conducted within the limited daylight hours. Accordingly, flights to NPI are scheduled outside of this window at the beginning and end of the day. In summer months, to maximise the time crews can spend on a NUI it is true that NUI flights are typically made at the beginning and end of the day and NPI flights are typically made in the middle of the day. As a result, the impact of the loss of night flying calculated by both PNSL and the Applicant is an under-estimate rather than an over-estimate.</p>	<p>In Mr Prior's experience of working as a pilot in Southern North Sea, the normal flight pattern is to drop off personnel on a NUI and collect them at the end of the day. Therefore, the helicopter is used between those flights for other locations, such as manned platforms/NPIs.</p> <p>Perenco would have data on helicopter flights to NPIs during the decommissioning of Guinevere and Pickerill. The Applicant has requested this data from Perenco to substantiate the level of night time flying to NPI.</p>

ID	Perenco Comment	Applicant Response
4.7 New Civil Aviation Authority (CAA) Regulations		
13	<p>PNSL has no firm information on the timescales or method by which the CAA will implement the new regulations for operations within wind farms. PNSL understands, however, that all North Sea helicopter operators are currently updating their operating manuals to incorporate the proposals so that they will be de-facto requirements. At ISH7, Mr Prior, speaking on behalf of the Applicant, suggested that the CAA is becoming more cautious e.g., when approving exceptions to its rules. As noted at ISH7 by Mr Sanders of PNSL, a corollary of such a more cautious approach would be that the CAA may be reluctant to approve CAT operations within a wind farm array that rely on minimum distances with no contingency. This would support PNSL's position that more obstacle-free space around the Waveney Installation and Durango Well is required.</p>	<p>It must also be noted that there are three existing Dudgeon Offshore Wind Farm turbines within 3nm of the Waveney platform, with the closest at 2.7nm.</p> <p>Under the new CAA regulation IMC and night flights would be lost, regardless of whether new turbines are built up to 1.26nm or not as there are already three existing turbines within 3nm. Perenco are relying on a dispensation which is by no means guaranteed.</p>
5. Progression of Applicant's and PNSL's positions		
14	<p>As summarised by Mr Morris for the Applicant, both PNSL and the Applicant position have changed through the course of the Examination. This reflects a better understanding of each other's positions and needs. The summary provided by Mr Thomas is accurate, namely that PNSL initially requested a 5nm radius clear of obstructions around its helidecks. This was subsequently reduced to 3nm, however PNSL could consider 1.26nm (to wind turbine rotor tips) with compensation through a commercial agreement however PNSL and the Applicant have not been able to agree such compensation at the date of this submission. PNSL has also highlighted that as a NPI helideck may be offset from the Waveney installation helideck by around 100m (0.05nm) in any direction, this distance also needs to be added to the preceding figures when measuring from the existing Waveney installation. The Applicant initially proposed that turbines be placed up to 500m (0.27nm) from the Waveney installation. This was modified to 1nm and subsequently to 1.01nm.</p> <p>A joint statement concerning the current status of negotiations is included in Perenco's answers to the Examiners Written Questions (WQ4)</p>	<p>The Applicant has submitted at Deadline 8 revised Protective Provisions for the benefit of Perenco at Part 15 of Schedule 14 of the draft DCO (Revision K) [document reference 3.1] which include a 1.26nm radius of provision for the Waveney Platform.</p> <p>Both parties agree that this mitigates the majority of the impact, with only between 2-4% of access subsequently lost, which is also dependent of Perenco getting a dispensation under the propose future CAA Regulations.</p> <p>The impact at 1.26nm is minimal, even accommodating for Perenco's change of operator and their greater stabilisation distance. All mitigation available to the Applicant has been put in place and therefore we meet the policy test to <i>"work with the impacted sector to minimise negative impacts and reduce risks to as low as reasonably practicable"</i> (EN-3 3.8.362) and that whilst we have some disagreement with Perenco about the economic impact, both agree that we will not <i>"affect the future viability or safety of an existing or approved/licensed offshore infrastructure"</i> (EN-3 3.8.365) as Perenco have put forward that at 1.26nm they would not be required to close production at Waveney.</p>

Table 3 The Applicant's Comments on Perenco's Deadline 7 Submission: Responses to the Examining Authority's Fourth Written Questions

ID	Question	Perenco Responses	Applicant's Comment
Q4.21. Oil, Gas and Other offshore infrastructure and activities			
Q4.21.1 Helicopter Access			
Q4.21.1.1	<p>Take Off Space Required</p> <p>Provide a view, following the discussions at ISH 7 [EV-097 to EV-101], of whether 1.01nm is sufficient distance to allow for One Engine Inoperable take-offs.</p>	<p>As set out in Perenco's Deadline 3 written Summary of Oral Submission at ISH6 (REP3-154), the distance required for a take-off with one engine inoperable (OEI) under the least favourable (but not extreme) conditions is 1.42nm to the nearest turbine base. If the wind turbine rotors have a diameter of 300m, this would be 1.34nm to the nearest wind turbine rotor tip. With slightly less unfavourable conditions, the distance required would still be 1.3nm to the nearest rotor tip. Recognising the minimum wind turbine spacing of 1.05km, Perenco accepts that an OEI take-off could be executed with wind turbine rotor tips no nearer than 1.26nm from the helideck. Perenco does not accept that 1.01nm is sufficient distance to the nearest wind turbine rotor tip to execute an OEI take-off unless the aircraft payload were significantly restricted (which would in turn require more flights and increase the risk of major accidents on the Waveney installation).</p>	<p>The Applicant notes that Perenco accept that a 1.26nm buffer and the 1.05km turbine spacing would be sufficient for a OEI take off.</p> <p>The Applicant has included updated Protective Provisions for a 1.26nm radius around the Waveney platform at Deadline 8 (see Part 15 of Schedule 14 of the draft DCO (Revision K) [document reference 3.1]).</p>
Q421.1.2	<p>Required Approach Distance</p> <p>Please provide a view, following the discussions at ISH 7 [EV-097 to EV-101], of whether 1.34nm for the approach is necessary and the effects on flights if it is less than 1.34nm.</p>	<p>Unlike the distance required for take-off, which is dependent on aircraft type, payload and meteorological conditions, the distance required for approach and landing is independent of aircraft type, payload and meteorological conditions. Perenco and the Applicant agree that a rate 1 turn followed by a stabilised approach is required. The Applicant has based their derivation of the distance required on a stabilised approach of 0.5nm. 0.5nm is the absolute minimum distance required for a stabilised approach under current policy and guidance. Only one helicopter operator in the North Sea uses 0.5nm for stabilised approach. All other North Sea helicopter</p>	<p>Perenco's current operator is safely using a 0.5nm stabilisation path at present.</p> <p>Nevertheless, the Applicant has included Protective Provisions at Part 15 of Schedule 14 of the draft DCO (Revision K) [document reference 3.1] for a 1.26nm radius which allow for the extended 0.75nm stabilisation path used by Perenco's future operator.</p>

ID	Question	Perenco Responses	Applicant's Comment
		<p>operators use a longer stabilised approach of 0.7nm or 0.75nm.</p> <p>Perenco has based its determination of the distance required for approach and landing on a stabilised approach of 0.75nm as required by its Helicopter Operator. This results in a distance of no less than 1.26nm being required from the helideck to the nearest wind turbine rotor tip. If the wind turbine rotors have a diameter of 300m, this would equate to a distance of 1.34nm to the nearest wind turbine base.</p> <p>Were any wind turbines placed with rotor tips closer than 1.26nm, approaches would not be possible from that direction. As an approach must be made into wind, this would preclude operations when the wind is from any direction that would bring the approach path within 500' of the wind turbine rotor tips (as illustrated below).</p> 	
Q4.21.1.4	<p>Joint Statement Whilst it is apparent that there have been negotiations between Perenco and the Applicant, with a hope of an agreed negotiated position before the end of examination, at D7 please provide a joint</p>	<p>Status of Negotiations The Applicant and Perenco are in active discussions. Progress has been made on the template and wording for protective provisions regarding both the Waveney installation and Waveney to Durango pipeline.</p>	<p>The Applicant welcomes the Joint Position Statement (see Appendix A.7 of Supporting Documents for the Applicant's Responses to the Examining Authority's Fourth Written Questions [document reference 21.5.1])</p>

ID	Question	Perenco Responses	Applicant's Comment
	<p>statement setting out each party's position at that time and any remaining points of dispute, together with identified steps to a potential resolution within the Examination.</p>	<p>Both parties will submit draft Protective Provisions at Deadline 7. The significant difference being the distance which defines the "facilities proximity area" for the existing Waveney installation. Discussions are ongoing to resolve this remaining difference. Commercial discussions are also ongoing.</p> <p>The following, jointly agreed, comparison of Perenco and the Applicant's Analysis of the Impact of DEP on Helicopter Operations to Waveney, highlights the key differences between their respective positions.</p> <p>Comparison of Perenco and the Applicant's Analysis of the Impact of DEP on Helicopter Operations to Waveney.</p> <p>Meteorological conditions</p> <p>The Applicant and Perenco are in broad agreement as to the classification of meteorological conditions based on historic data. Table 1 below present this. The Applicant has split the data by year [REP4-039] whereas Perenco have provided a single figure [REP6-035].</p> <p><i>Table 1 Equinor and Perenco classification of historic meteorological data for VMC, IMC usable and IMC no-fly.</i></p>	<p>and the efforts made by Perenco to work constructively and understand one another's positions.</p>

ID	Question	Perenco Responses	Applicant's Comment																																								
		<table border="1" data-bbox="853 331 1525 743"> <thead> <tr> <th>Current CAA Limits</th> <th>2020</th> <th>2021</th> <th>2022</th> <th>Perenco [REP6-035]</th> </tr> </thead> <tbody> <tr> <td>Day VMC</td> <td>92.3%</td> <td>94.5%</td> <td>95.4%</td> <td>94%¹</td> </tr> <tr> <td>Day IMC (usable)</td> <td>3.1%</td> <td>3.6%</td> <td>1.5%</td> <td>2%¹</td> </tr> <tr> <td>Day IMC (no-fly)</td> <td>4.6%</td> <td>1.9%</td> <td>3.1%</td> <td>4%¹</td> </tr> <tr> <td colspan="5">Future CAA Limits</td> </tr> <tr> <td>Day VMC</td> <td>90.8%</td> <td>93.3%</td> <td>94.7%</td> <td>94%²</td> </tr> <tr> <td>Day IMC (usable)</td> <td>4.6%</td> <td>4.8%</td> <td>2.2%</td> <td>2%²</td> </tr> <tr> <td>Day IMC (no-fly)</td> <td>4.6%</td> <td>1.9%</td> <td>2.2%</td> <td>4%²</td> </tr> </tbody> </table> <p data-bbox="842 759 1491 818">¹ Perenco: Comparative tables of information regarding helicopter access - Current Rules [REP6-035]</p> <p data-bbox="842 823 1507 911">² Perenco: Comparative tables of information regarding helicopter access - With Proposed CAA Limitations near windfarms [REP6-035]</p> <p data-bbox="842 946 1541 1281">N.B. Perenco have the same percentages for conditions under both current and future Civil Aviation Authority (CAA) limits. Perenco do not believe the future CAA limits will apply unless new wind turbines are placed closer than 3nm (assuming dispensation for the existing Dudgeon Wind Farm turbines which has one wind turbine at 2.7nm from the Waveney installation). Both the Applicant and Perenco agree that with the Dudgeon Extension Project (DEP) wind turbines being within 3nm, helicopter access would no longer be possible under instrument meteorological conditions (IMC) useable flight weather.</p> <p data-bbox="842 1313 1485 1369">Impact of loss of Day usable IMC on accessing the Waveney installation</p>	Current CAA Limits	2020	2021	2022	Perenco [REP6-035]	Day VMC	92.3%	94.5%	95.4%	94% ¹	Day IMC (usable)	3.1%	3.6%	1.5%	2% ¹	Day IMC (no-fly)	4.6%	1.9%	3.1%	4% ¹	Future CAA Limits					Day VMC	90.8%	93.3%	94.7%	94% ²	Day IMC (usable)	4.6%	4.8%	2.2%	2% ²	Day IMC (no-fly)	4.6%	1.9%	2.2%	4% ²	
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		<p>The next step is calculating how the loss of useable IMC impacts flights to and from the Waveney installation. This step takes account for daily return flights and the weather windows in which Perenco typically access the Waveney installation. This is a step where the Applicant and Perenco have taken diverging methodologies and a side-by-side comparison of the numbers is not possible. The applicant has looked at historical flight data and coupled it with the meteorological data to identify flights that would have historically been impacted, had DEP wind turbines been present.</p> <p>Perenco have applied weather windows to the historical meteorological data to calculate further reduced access percentages.</p> <p>Perenco calculation of access reduction Perenco have taken the historical meteorological data above and applied further logistical restrictions, based on extensive operational experience.</p> <p>For access to Waveney installation:</p> <ul style="list-style-type: none"> • a 2hr window of suitable conditions; and • requirement for 2 flights within the available day with at least 5hrs between them • <p>For access to a non-production installation (NPI):</p> <ul style="list-style-type: none"> • 2hr window of suitable conditions is assumed necessary for a flight to leave Norwich <p>The further restriction has been placed on the available VMC and IMC usable flight times in the meteorological data record. The percentage with no wind turbines represents the base case. The percentages for wind turbine rotor tips greater than 1.26nm away represents</p>	

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		<p>access in day VMC only (loss of usable day IMC). The percentages for wind turbine rotor tips less than 1.01nm represent the remaining access after the loss of day usable IMC and the loss of VMC access where only the small percentage of time when an east-west approach would be possible.</p> <p><i>Table 2 Perenco calculation for Daylight Access</i></p> <table border="1" data-bbox="846 550 1529 1002"> <thead> <tr> <th>Operations possible at Waveney NUI</th> <th>No Wind Turbines</th> <th>With Wind Turbine Rotor Tips >1.26nm</th> <th>With Wind Turbine Rotor Tips <1.01nm</th> </tr> </thead> <tbody> <tr><td>January</td><td>65%</td><td>61%</td><td>6%</td></tr> <tr><td>February</td><td>61%</td><td>54%</td><td>6%</td></tr> <tr><td>March</td><td>62%</td><td>55%</td><td>4%</td></tr> <tr><td>April</td><td>77%</td><td>75%</td><td>2%</td></tr> <tr><td>May</td><td>78%</td><td>73%</td><td>3%</td></tr> <tr><td>June</td><td>78%</td><td>73%</td><td>2%</td></tr> <tr><td>July</td><td>72%</td><td>67%</td><td>2%</td></tr> <tr><td>August</td><td>77%</td><td>75%</td><td>3%</td></tr> <tr><td>September</td><td>74%</td><td>71%</td><td>4%</td></tr> <tr><td>October</td><td>71%</td><td>66%</td><td>2%</td></tr> <tr><td>November</td><td>66%</td><td>62%</td><td>3%</td></tr> <tr><td>December</td><td>60%</td><td>54%</td><td>2%</td></tr> <tr><td>Annual average</td><td>71%</td><td>67%</td><td>3%</td></tr> </tbody> </table> <p><i>Table 3 Perenco calculation for non-production installation access (day and night access)</i></p>	Operations possible at Waveney NUI	No Wind Turbines	With Wind Turbine Rotor Tips >1.26nm	With Wind Turbine Rotor Tips <1.01nm	January	65%	61%	6%	February	61%	54%	6%	March	62%	55%	4%	April	77%	75%	2%	May	78%	73%	3%	June	78%	73%	2%	July	72%	67%	2%	August	77%	75%	3%	September	74%	71%	4%	October	71%	66%	2%	November	66%	62%	3%	December	60%	54%	2%	Annual average	71%	67%	3%	
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		<p><i>Table 4 Equinor analysis of historical flight data</i></p> <table border="1" data-bbox="848 395 1527 536"> <thead> <tr> <th></th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td>Helicopter Flights Impacted</td> <td>2.77%</td> <td>1.56%</td> </tr> <tr> <td>Hours of access lost (hh:mm)</td> <td>02:16</td> <td>00:16</td> </tr> </tbody> </table> <p>If these helicopter flights could not be delayed or brought forward and therefore the corresponding return or outbound flight was also lost due to an insufficient weather window, then the percentages increase to 5.54% and 3.12% which is similar to the 4% loss of daylight access to Waveney installation that Perenco predicts for wind turbines rotors at a distance >1.26nm.</p> <p>The Applicant has not carried out an analysis of night-time access to an NPI as historical flight data was only available for routine access to the Waveney installation.</p> <p>Summary</p> <p>As reflected at ISH7 the Applicant and Perenco broadly agree on the split of VMC, IMC usable, and IMC no fly. For access to the Waveney installation usable IMC access would be lost with wind turbines closer than 3nm and this accounts for 2 to 4.8% of daylight hours.</p> <p>The Applicant's and Perenco's secondary analysis of how loss of IMC usable flight time effects access to Waveney installation follows different methodologies and are not directly comparable. Perenco have applied weather windows and return flight criteria whilst the applicant has used historical flight data provided by Perenco.</p> <p>Perenco calculate a loss of access for Waveney installation as 4% (down to 67%) with wind turbine rotor</p>		2020	2021	Helicopter Flights Impacted	2.77%	1.56%	Hours of access lost (hh:mm)	02:16	00:16	
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		<p>tips over 1.26nm and 68% (down to 3%) with wind turbine rotor tips closer than 1.01nm.</p> <p>The Applicant's analysis for the Waveney installation calculates that 2 out of 72 (2.8%) flights would have been impacted in 2020 and 1 out of 64 (1.6%) in 2021 with wind turbine tips 1.01nm from Waveney installation. The Applicant believes, based on the historic meteorological data, that these flights could have been rescheduled. However, assuming a worst case that rescheduling was not possible and therefore the corresponding return or outbound flight was made redundant, the Applicant calculates losses of 5.54% and 3.12% which is similar to the loss of daylight access to Waveney installation that Perenco predicts for wind turbines rotors at a distance >1.26nm.</p> <p>Perenco calculate a loss of access for a NPI at the Waveney installation as 11% (down to 77%) with wind turbine rotor tips over 1.26nm and 83% (down to 5%) with wind turbine rotor tips closer than 1.01nm.</p> <p>The Applicant has not carried out a historical flight data review for a nonproduction installation at Waveney installation as historical flight data for a decommission operation at Waveney installation does not exist.</p> <p>The key point of difference between the Applicant and Perenco is the distance at which VMC in all wind directions is retained. The Applicant maintains VMC access in any wind condition is possible at 1.01nm based on the current helicopter operators 0.5nm stabilised approach distance.</p> <p>Perenco maintains that 1.26nm is required for VMC access in any wind direction based upon a 0.75nm stabilised approach distance of the future helicopter operator.</p>	

Figure 1

380000

400000

Sheringham Shoal and Dudgeon Extension Projects

Title:

DEP-N Waveney Platform

Document:

Legend:

- Dudgeon Offshore Wind Farm Extension Project Wind Farm Site
- Sheringham Shoal Offshore Wind Farm Extension Project Wind Farm Site
- Offshore Temporary Work Area
- Existing Offshore Wind Farm
- Existing Offshore Wind Farm Export Cable
- Waveney Platform
- Turbines
- Waveney – Durango Pipeline
- Waveney – Durango Pipeline 1km Buffer
- Waveney Platform 1nm Works Plan Buffer within DEP-N Array Area
- Waveney Platform 1.26nm Buffer within DEP-N Array Area
- Waveney Platform 3nm Buffer within DEP-N Array Area
- Dudgeon OWF 1nm Buffer



Coordinate Reference System: WGS 1984 UTM Zone 31N
 Transformation WGS84: OSGB_1936_To_WGS_1984_7



Scale: 1:93,000

Scale at size: A3

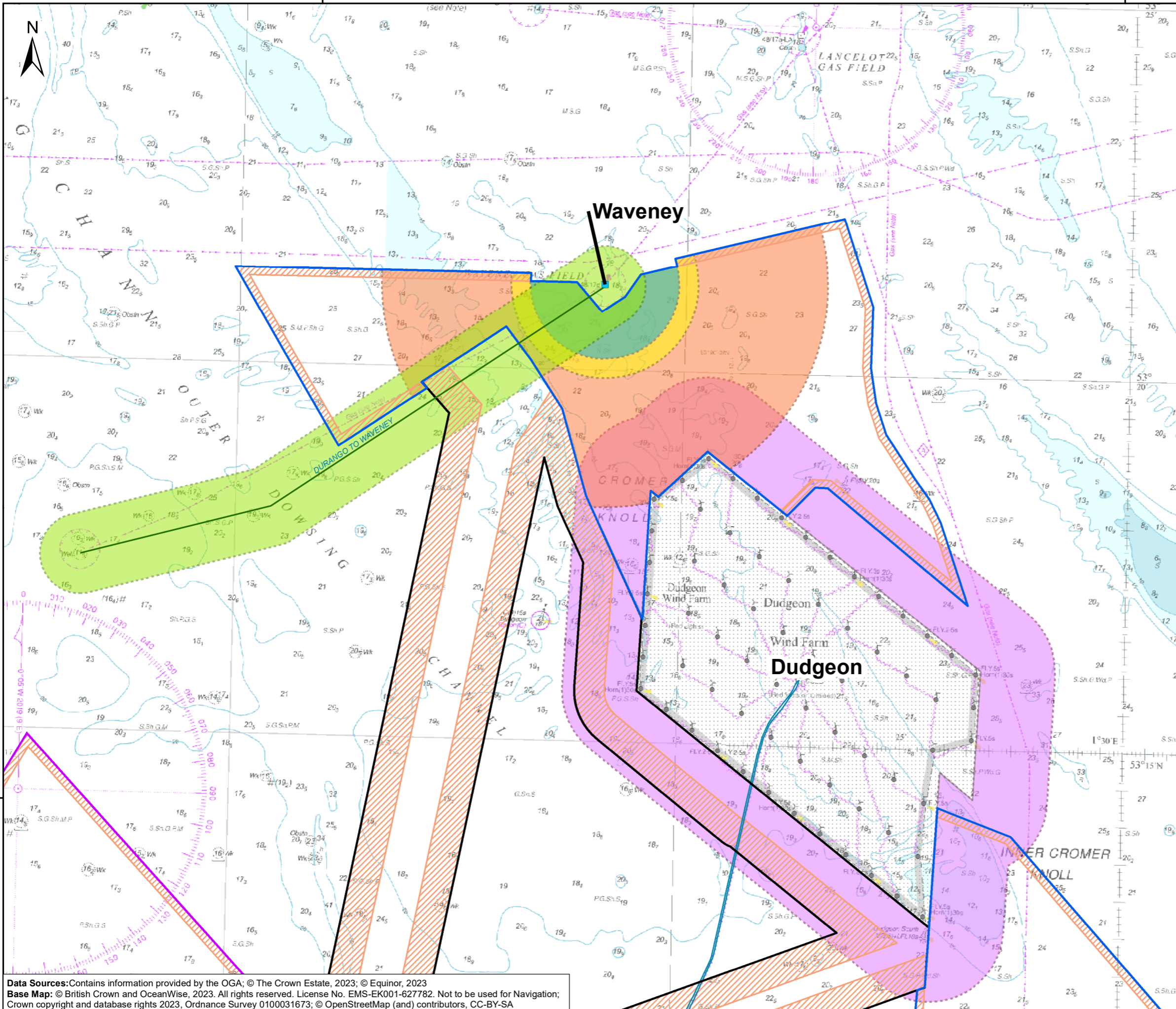
Equinor Doc. no.: C282-RH-Z-GA-00056
 RHDHV Doc. no.: PB8164-RHD-ZZ-OF-DR-Z-0310

REV	DATE	STATUS	DRW	CHK	APR
A	16/07/2023	First Issue	GC	KH	PM



Waveney

Dudgeon



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