Bowdun Offshore Wind Farm, Offshore EIA Report

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IFP Safeguarding Report
Bowdun OWF

Aberdeen Airport

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Executive Summary

This IFP Safeguarding Report assesses the impact of the Bowdun Offshore Wind Farm (hereafter known as the Proposed Development), located approximately 50km south-east of Aberdeen Airport, on Aberdeen Airport's Instrument Flight Procedures (IFPs).

This report considers the currently published IFPs[1], and the recently submitted RNP IAPs at Aberdeen Airport, it does not consider any other aspects of aerodrome safeguarding.

The IFP safeguarding assessment concludes that the Proposed Development, based on the supplied obstacle dataset as detailed in section 1, **would have an impact** on Aberdeen Airport's IFP.

The following IFP or aspects of IFP would be impacted by the Proposed Development:

Minimum Sector Altitudes (MSA)

The IFP safeguarding assessment has found an impact to the NDB ATF and ARP based southeast[2] MSA sector/s. The ATF southeast MSA sector MOCA[3] would be required to be increased by 400ft, from 1800ft to 2200ft, to accommodate the Proposed development. Similarly, the ARP southeast MSA sector MOCA would be required to be increased by 100ft, from 2100ft to 2200ft, to accommodate the Proposed development.

The MSA configuration at Aberdeen Airport is currently under review, please see section 3 for further details.

If the Proposed Development wind turbines are able to remain below 340m above mean sea level, and the ARP based MSA is taken forward, then there would be no impact to Aberdeen Airport's IFP.

[1] UK AIP EGPD AD 2.24 (AIRAC 10/2025)
[2] 270°-360°
[3] MOCA – Minimum Obstacle Clearance Altitude

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1. Introduction

IFP Design Ltd have been contracted via Trax International Ltd by Tetra Tech RPS Energy Ltd, to assess the impact of the Proposed Development, on Aberdeen Airport's Instrument Flight Procedures (IFPs).

The Proposed Development covers the Option Lease Area that is located in the E3 Plan Option Area (POA), detailed in the Sectoral Marine Plan (SMP) for Offshore Wind Energy (Scottish Government, 2020). The Array Area of the Proposed Development is located approximately 38 km off the Aberdeenshire coast, with a total lease area of 187 km^2 and comprises of Wind Turbines (fixed), Inter-Array Cables (IACs), Offshore Substation Platforms (OSPs), Interconnector Cables and any necessary scour/cable protection. Only the Wind Turbines and OSPs will be visible above the sea level.

1.1. Design Methodology

This report assesses all Instrument Flight Procedures at Aberdeen Airport only and does not assess the Annex 14/CAP 168 Obstacle Limitation Surfaces.

This report considers the currently published IFPs[4], and the recently submitted RNP IAPs at Aberdeen Airport, it does not consider any other aspects of aerodrome safeguarding.

The proposed wind turbine coordinates, elevation above mean sea level, rotor diameter and relevant buffers have been provided by Bowdun Offshore Wind Farm Ltd (BOWFL) (the Applicant).

The horizontal extent used for the impact assessment, for each wind turbine obstacle, is comprised of the sum of ½ of the rotor diameter (326m), plus a 50m micrositing allowance and a 50m horizonal buffer, for conservatism. This gives the value for the radius of 263m, as detailed in Table 1.

This report only considers the IFP impact from the proposed wind farm and does not consider any operational ATC or Aerodrome mitigations that may be available.

Wherever possible, data validation checks were carried out to ensure the accuracy of the obstacle data used.

All the calculations and the drawing constructions were based on design criteria in ICAO Doc 8168 Vol II Edition 7, Amendment 10, published in November 2024.

[4] UK AIP EGPD AD 2.24 (AIRAC 10/2025)

1.2. Obstacle Details

The Wind Turbine obstacle dataset, for the Bowdun Offshore Wind Farm, is presented in Table 1. The dataset presents an indicative Proposed Development layout for the 40 Wind Turbine locations, plus up to four spare locations. The spare Wind Turbine locations provide alternative locations should seabed conditions be challenging for foundation installation. The final layout will only be up to 40 Wind Turbines and will be agreed with MD-LOT[5] and other required stakeholders prior to construction.

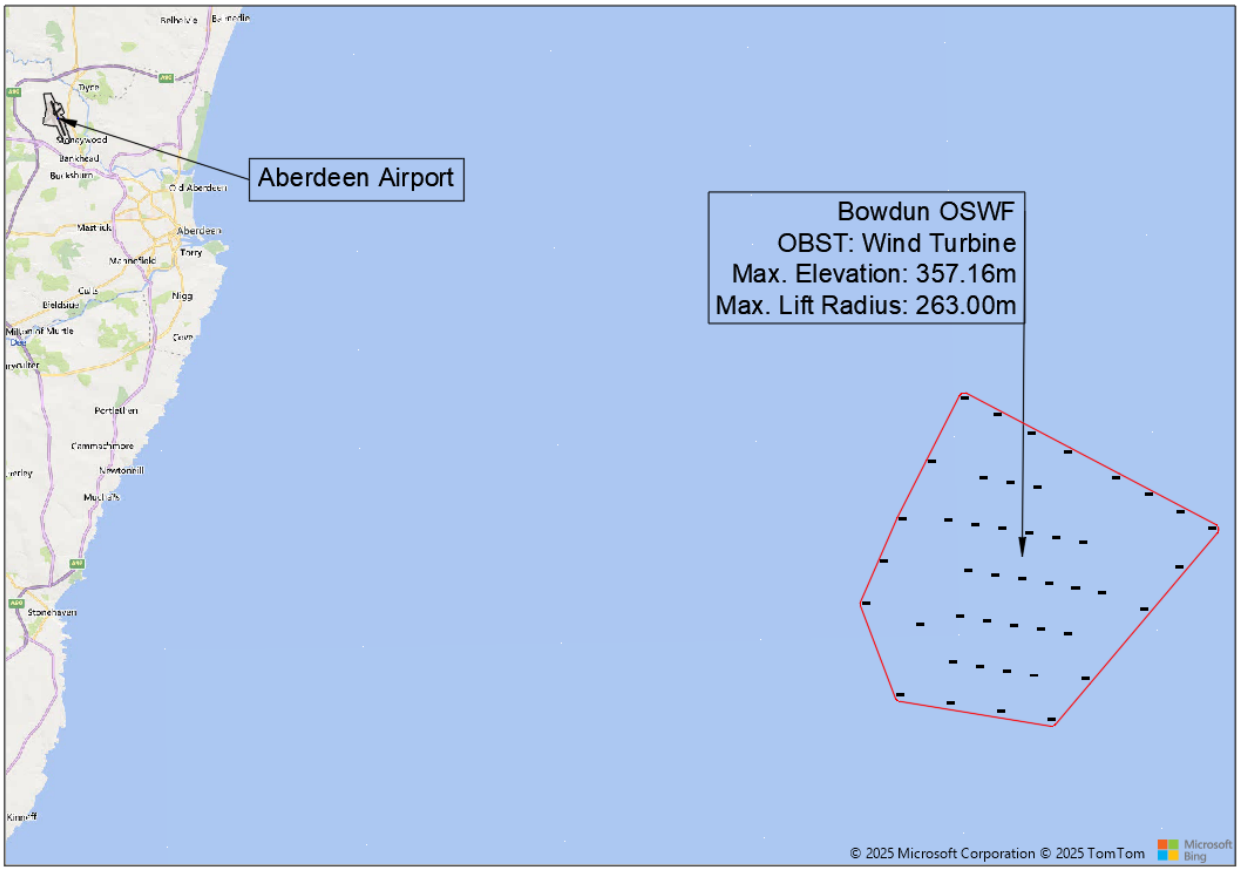

Figure 1: Proposed offshore wind farm's location

Site Boundary is for Illustrative location of Bowdun Wind Farm only. Co-ordinates of Wind turbines used provided by TWP.

1.3. Obstacle Data

The obstacle details in the table below have been taken forward for assessment:

Obstacle ID	Obstacle Type	OSGB Easting	OSGB Northing	Latitude	Longitude	Elevation (m) AMSL	Radius (m)
WT01	OBST:Wind Turbine	434910.31	793194.11	57° 01' 42.71" N	001° 25' 35.55" W	357.16	263.00
WT02	OBST:Wind Turbine	436715.43	796607.26	57° 03' 32.58" N	001° 23' 46.71" W	357.16	263.00
WT03	OBST:Wind Turbine	438462.09	795654.55	57° 03' 1.26" N	001° 22' 3.57" W	357.16	263.00

[5] Marine Directorate – Licensing Operations Team

WT04	OBST:Wind Turbine	440327.32	794637.16	57° 02' 27.79" N	001° 20' 13.49" W	357.16	263.00
WT05	OBST:Wind Turbine	442222.17	793603.61	57° 01' 53.76" N	001° 18' 21.71" W	357.16	263.00
WT06	OBST:Wind Turbine	444830.99	792180.63	57° 01' 6.86" N	001° 15' 47.9" W	357.16	263.00
WT07	OBST:Wind Turbine	446548.02	791244.04	57° 00' 35.96" N	001° 14' 6.73" W	357.16	263.00
WT08	OBST:Wind Turbine	448265.04	790307.46	57° 00' 5.04" N	001° 12' 25.61" W	357.16	263.00
WT09	OBST:Wind Turbine	449982.06	789370.89	56° 59' 34.1" N	001° 10' 44.53" W	357.16	263.00
WT10	OBST:Wind Turbine	448178.77	787299.54	56° 58' 27.81" N	001° 12' 32.79" W	357.16	263.00
WT11	OBST:Wind Turbine	446242.30	785075.23	56° 57' 16.59" N	001° 14' 28.91" W	357.16	263.00
WT12	OBST:Wind Turbine	443014.85	781368.06	56° 55' 17.83" N	001° 17' 42.18" W	357.16	263.00
WT13	OBST:Wind Turbine	441139.10	779213.51	56° 54' 8.77" N	001° 19' 34.35" W	357.16	263.00
WT14	OBST:Wind Turbine	438442.24	779698.00	56° 54' 25.27" N	001° 22' 13.48" W	357.16	263.00
WT15	OBST:Wind Turbine	435745.58	780182.40	56° 54' 41.71" N	001° 24' 52.63" W	357.16	263.00
WT16	OBST:Wind Turbine	433048.90	780666.81	56° 54' 58.09" N	001° 27' 31.82" W	357.16	263.00
WT17	OBST:Wind Turbine	434170.09	784414.57	56° 56' 58.99" N	001° 26' 23.71" W	357.16	263.00
WT18	OBST:Wind Turbine	431252.47	785630.26	56° 57' 39.05" N	001° 29' 15.83" W	357.16	263.00
WT19	OBST:Wind Turbine	432277.98	787860.91	56° 58' 50.93" N	001° 28' 14.1" W	357.16	263.00
WT20	OBST:Wind Turbine	433281.55	790101.57	57° 00' 3.13" N	001° 27' 13.61" W	357.16	263.00
WT21	OBST:Wind Turbine	437668.85	792249.19	57° 01' 11.37" N	001° 22' 52.47" W	357.16	263.00
WT22	OBST:Wind Turbine	439112.59	791989.53	57° 01' 2.54" N	001° 21' 27.02" W	357.16	263.00
WT23	OBST:Wind Turbine	440556.33	791729.87	57° 00' 53.7" N	001° 20' 1.59" W	357.16	263.00
WT24	OBST:Wind Turbine	435780.85	790038.63	57° 00' 0.43" N	001° 24' 45.54" W	357.16	263.00
WT25	OBST:Wind Turbine	437224.60	789778.98	56° 59' 51.62" N	001° 23' 20.12" W	357.16	263.00
WT26	OBST:Wind Turbine	438668.34	789519.33	56° 59' 42.8" N	001° 21' 54.72" W	357.16	263.00
WT27	OBST:Wind Turbine	440112.08	789259.67	56° 59' 33.96" N	001° 20' 29.33" W	357.16	263.00
WT28	OBST:Wind Turbine	441555.82	789000.02	56° 59' 25.11" N	001° 19' 3.95" W	357.16	263.00
WT29	OBST:Wind Turbine	442999.55	788740.37	56° 59' 16.24" N	001° 17' 38.59" W	357.16	263.00
WT30	OBST:Wind Turbine	436780.36	787308.77	56° 58' 31.87" N	001° 23' 47.74" W	357.16	263.00
WT31	OBST:Wind Turbine	438224.10	787049.12	56° 58' 23.05" N	001° 22' 22.38" W	357.16	263.00
WT32	OBST:Wind Turbine	439667.85	786789.47	56° 58' 14.22" N	001° 20' 57.04" W	357.16	263.00
WT33	OBST:Wind Turbine	441111.59	786529.83	56° 58' 5.37" N	001° 19' 31.71" W	357.16	263.00
WT34	OBST:Wind Turbine	442555.32	786270.18	56° 57' 56.51" N	001° 18' 6.39" W	357.16	263.00
WT35	OBST:Wind Turbine	443999.06	786010.54	56° 57' 47.62" N	001° 16' 41.09" W	357.16	263.00
WT36	OBST:Wind Turbine	436336.13	784838.55	56° 57' 12.11" N	001° 24' 15.32" W	357.16	263.00
WT37	OBST:Wind Turbine	437779.88	784578.91	56° 57' 3.3" N	001° 22' 50.01" W	357.16	263.00

WT38	OBST:Wind Turbine	439223.62	784319.27	56° 56' 54.47" N	001° 21' 24.72" W	357.16	263.00
WT39	OBST:Wind Turbine	440667.36	784059.63	56° 56' 45.63" N	001° 19' 59.44" W	357.16	263.00
WT40	OBST:Wind Turbine	442111.10	783799.99	56° 56' 36.77" N	001° 18' 34.17" W	357.16	263.00
WT41	OBST:Wind Turbine	435892.53	782371.81	56° 55' 52.47" N	001° 24' 42.83" W	357.16	263.00
WT42	OBST:Wind Turbine	437335.79	782109.44	56° 55' 43.57" N	001° 23' 17.6" W	357.16	263.00
WT43	OBST:Wind Turbine	438779.59	781850.08	56° 55' 34.76" N	001° 21' 52.35" W	357.16	263.00
WT44	OBST:Wind Turbine	440224.50	781596.94	56° 55' 26.13" N	001° 20' 27.05" W	357.16	263.00

Table 1: Wind turbine obstacle data

2. Assessment

The table below provides a summary of the IFP safeguarding assessment.

IFP	Impact
ATCSMAC All SMAAs & FAVAs (Published)	The proposed offshore wind farm is located outside of the lateral extents of the ATCSMAC SMAA[6] and FAVA[7]. Therefore, there is no impact.
ATCSMAC All SMAAs & FAVAs (Proposed amendment)	The proposed offshore wind farm is located outside of the lateral extents of the ATCSMAC SMAA and FAVA. Therefore, there is no impact.
Minimum Sector Altitudes (MSA) ADN	**The proposed offshore wind farm is located outside of the lateral extents of the VOR ADN based MSA. However, due to the requirements of CAP785B there is a potential impact. See section 3.**
MSA ATF	**The proposed offshore wind farm is located within the lateral extents of the northeast and southeast MSA sectors and has an impact on the southeast sector MOCA. See section 3.**
MSA ARP	**The proposed offshore wind farm is located within the lateral extents of the southeast MSA sectors and has an impact on the southeast sector MOCA. See section 3.**
Holds (ADN ,ATF & DOWNI)	The proposed offshore wind farm's elevation is less than the Holds' LHA[8] minus MOC[9]. Therefore, there is no impact.
Visual Manoeuvring (Circling) Total Area (All Aircraft Categories)	The proposed offshore wind farm is located outside of the lateral extents of the total visual circling protection areas. Therefore, there is no impact.
Visual Manoeuvring (Circling) East of RWY 16/34 (All Aircraft Categories)	The proposed offshore wind farm is located outside of the lateral extents of the restricted visual circling protection areas. Therefore, there is no impact.
RWY16 ILS/DME	The proposed offshore wind farm is located outside of the lateral extents of the IAP protection areas. Therefore, there is no impact.
RWY16 OFZ[10]	The proposed offshore wind farm is located outside of the lateral extents of the OFZ for RWY16. Therefore, there is no impact.
RWY16 LOC/DME	The proposed offshore wind farm is located outside of the lateral extents of the IAP protection areas. Therefore, there is no impact.
RWY16 VOR/DME	The proposed offshore wind farm is located outside of the lateral extents of the IAP protection areas. Therefore, there is no impact.
RWY16 RNP	The proposed offshore wind farm is located outside of the lateral extents of the IAP protection areas. Therefore, there is no impact.
RWY16 Visual Surface Segment (VSS)	The proposed offshore wind farm is located outside of the lateral extents of all RWY16 VSS. Therefore, there is no impact.

[6] SMAA - Surveillance Minimum Altitude Area
[7] FAVA – Final Approach Vectoring Area
[8] LHA – Lowest Holding Altitude
[9] MOC – Minimum Obstacle Clearance
[10] OFZ – Obstacle free Zone

RWY34 Direct Arrivals	The proposed offshore wind farm is located outside of the lateral extents of the Direct Arrival protection areas. Therefore, there is no impact.
RWY34 ILS/DME	The proposed offshore wind farm is located outside of the lateral extents of the IAP protection areas. Therefore, there is no impact.
RW34 OFZ	The proposed offshore wind farm is located outside of the lateral extents of the OFZ for RWY34. Therefore, there is no impact.
RWY34 LOC/DME	The proposed offshore wind farm is located outside of the lateral extents of the IAP protection areas. Therefore, there is no impact.
RWY34 VOR/DME	The proposed offshore wind farm is located outside of the lateral extents of the IAP protection areas. Therefore, there is no impact.
RWY34 NDB(L)/DME	The proposed offshore wind farm is located outside of the lateral extents of the IAP protection areas. Therefore, there is no impact.
RWY34 RNP	The proposed offshore wind farm is located outside of the lateral extents of the IAP protection areas. Therefore, there is no impact.
RWY34 Visual Surface Segment (VSS)	The proposed offshore wind farm is located outside of the lateral extents of all RWY34 VSS. Therefore, there is no impact.

Table 2: IFP safeguarding assessment summary

3. Conclusion

The IFP safeguarding assessment concludes that the proposed offshore wind farm, based on the obstacle data in section 1, **would impact** Aberdeen Airport's IFPs.

The impact and possible mitigation is described below.

3.1. Minimum Sector Altitudes.

The IFP safeguarding assessment has found an impact to the NDB ATF and ARP based southeast[11] MSA sector/s. The ATF southeast MSA sector MOCA[12] would be required to be increased by 400ft, from 1800ft to 2200ft, to accommodate the Proposed development. Similarly, the ARP southeast MSA sector MOCA would be required to be increased by 100ft, from 2100ft to 2200ft, to accommodate the Proposed development.

The MSA configuration at Aberdeen Airport is currently under review. The currently published MSAs at Aberdeen are based on the VOR ADN and NDB ATF. CAP785B[13] states that where an MSA is based on more than one facility the respective sector MOCAs shall be combined so that the highest value is used. This is not the case at Aberdeen and the ATF MSA southeast sector MOCA is less than the ADN MSA southeast sector MOCA. Due to this and the relative location of ADN and ATF, the ongoing IFP periodic review has recommended that the MSA is based on the ARP moving forward. This approach has been agreed with the UK CAA IFP regulator and V1.1 of the IFP periodic review has been submitted to the regulator. It should be noted that regulatory response will undoubtedly require rework and resubmission. This should be factored into any project timelines.

Therefore, subject to Aberdeen Airport's approval and the timeline of UK CAA approval of the IFP periodic review; any impact to the published MSA sector MOCAs may be ignored and only the ARP based MSA impact need be considered. Depending on the proposed offshore wind farm project timeline; engagement with Aberdeen Airport is recommended to ensure any opportunity to align with the ongoing IFP submissions Aberdeen Airport have with the CAA is taken.

Therefore, as stated earlier, the ARP southeast MSA sector MOCA would be required to be increased by 100ft, from 2100ft to 2200ft, to accommodate the Proposed development. From an IFP point of view, the MOCA increase of 100ft may be incorporated simply as the initial approach altitudes for the conventional IAPs is 2500ft and the RNP IAPs 2300ft. It is important to note that this would be subject to Aberdeen Airport approval, as the IFPs are their responsibility and there may be operational reasons why this may not be simple. Also, consideration would need to be given to the timelines for the IFP periodic review and RNP IAP submission.

Alternatively, the Proposed development would need to restrict the elevation to 340m above mean sea level. It should be noted that only the following wind turbines would require a restriction in elevation: 01, 02, 03, 04, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 30 and 36. The remaining wind turbines would have no impact on the ARP based MSA.

[11] 270°-360°
[12] MOCA – Minimum Obstacle Clearance Altitude
[13] CAP 785B: Implementation and Safeguarding of IFPs in the UK

Any increase in MSA MOCA is required to be reflected on the ATCSMAC Chart.

Impacted Instrument Approach Charts: All currently published IACs, and the RNP IAPs when approved and promulgated, and the ATCSMAC chart.

MSA Sector	SE / 270°-360°
ARP MSA Sector MOCA	2100
MOC (m)	300
Max. Obstacle Elev. (m)	340
Obstacle derived MOCA (ft)	2200
Increase (ft)	100

Table 3: ARP MSA Sector MOCA impact