

CHAPTER 16: AVIATION

16.1	Executive Summary	16-2
16.2	Introduction	16-2
16.3	Scope of Assessment	16-2
16.4	Legislation, Policy and Guidance	16-3
16.5	Methodology	16-4
16.6	Baseline	16-4
16.7	Potential Effects	16-4
16.8	Mitigation	16-5
16.9	Residual Effects	16-5
16.10	Cumulative Effects	16-5
16.11	Conclusion	16-6
16.12	References	16-7

Technical Appendices (Volume 4)

Technical Appendix 16.1: Aviation Assessment

16. Aviation

16.1 Executive Summary

- 16.1.1 This Chapter considers the potential for effects of the Proposed Development on aviation interests.
- 16.1.2 Following the implementation of a suitable Ministry of Defence (MOD) lighting scheme, agreed with the MOD in accordance with MOD obstruction lighting guidance, there would be no effects on aviation as a physical obstruction.
- 16.1.3 Radar modelling confirms that no part of the Proposed Development is likely to be detected by any civil or military radar.
- 16.1.4 No significant effects have been identified in the assessment of aviation issues.

16.2 Introduction

- 16.2.1 This Chapter considers the likely potential impact of the Proposed Development on aviation interests, including those of the United Kingdom (UK) Civil Aviation Authority (CAA), MOD, NATS (that currently comprises NATS (En-Route) plc [NERL] and NATS (Services) Limited [NSL]), regional airports, local aerodromes and other UK aviation stakeholders.
- 16.2.2 This assessment has been carried out by Cyrrus Limited, a leading independent international consultancy providing a range of specialist aviation support services. Cyrrus has extensive experience of Air Traffic Control (ATC) radar and Air Defence radar operations regarding the effects of wind turbines and has previously addressed the aviation issues associated with many wind energy developments including Holbeach Marsh, Floods Ferry, Bamff, and others.
- 16.2.3 This Chapter is supported by Technical Appendix 16.1: Aviation Assessment.

16.3 Scope of Assessment

- 16.3.1 Consultation has been undertaken with statutory and non-statutory organisations and members of the public to inform the scope of the assessment.

Study Area

- 16.3.2 The study area for the assessment of effects on aviation is up to 200km from the Proposed Development.

Consultation Responses

- 16.3.3 The consultation responses relevant to the issues addressed in this Chapter are summarised within Table 16.1.

Table 16.1: Consultation Responses

Consultee	Summary Response	Comment/Action Taken
MOD	<p>In the interests of air safety, the MOD will request that all turbines be fitted with aviation safety lighting in accordance with the Civil Aviation Authority, Air Navigation Order.</p> <p>Defence Infrastructure Organisation (DIO) Safeguarding wishes to be consulted and notified of the progression of planning applications and submissions relating to this proposal to verify that it will not adversely affect defence interests.</p>	<p>CAA aviation lighting requirements in accordance with Article 219 of the Air Navigation Order come into effect at a height of 150m. As the turbines would be less than 150m to blade tip the Applicant would instead agree a suitable aviation lighting scheme with the MOD in accordance with MOD obstruction lighting guidance.</p> <p>The DIO will be kept updated and consulted on the progress of the application.</p> <p>Potential effects of the Proposed Development on MOD infrastructure are assessed within this Chapter.</p>
NATS	The proposed development has been examined from a technical safeguarding aspect and does not conflict with our safeguarding criteria.	Potential effects of the Proposed Development on NATS infrastructure are assessed within this Chapter.
Highlands and Islands Airports Limited (HIAL)	Our assessment has shown that the turbines could possibly affect the performance of electronic aeronautical systems for Inverness Airport. HIAL would not wish to see a degradation of any of these services, particularly the Radar installation.	An aviation assessment has been undertaken, including radar line of sight analysis, and has concluded that the turbines would have no effect on the radar at Inverness Airport. The Applicant would work closely with HIAL to provide the necessary information to alleviate any concerns surrounding possible turbine visibility to the airport radar.

16.4 Legislation, Policy and Guidance

16.4.1 There are a number of documents which provide guidance on aviation considerations, including:

- Onshore Wind Policy Statement (Scottish Government 2017);
- CAP 764: Policy and Guidelines on Wind Turbines (CAA 2016);
- CAP 032: UK Aeronautical Information Publication (AIP) (CAA 2020);
- CAP 670: Air Traffic Services Safety Requirements (CAA 2019);
- UK Military AIP (MOD 2020);
- Military Low Flying in the United Kingdom: The Essential Facts (MOD 2017); and
- MOD Obstruction Lighting Guidance (MOD 2014).

16.5 Methodology

- 16.5.1 A desk-based assessment and consultation was carried out to collect baseline data including:
- Proximity of civil and military airfields and helicopter landing areas;
 - Radar Line of Sight (RLoS) analysis of civil and military Primary Surveillance Radars (PSRs); and
 - Consultation with aviation operators and stakeholders.
- 16.5.2 In the absence of guidelines for determining significance of effects on aviation navigational equipment, the methodology used in this assessment is based on establishing whether or not there would be any effect.
- 16.5.3 Where there is a potential effect, appropriate mitigation measures have been identified to avoid or reduce effects. Significance is not attributed and therefore effects predicted for aviation safety are considered qualitatively using professional judgement.

16.6 Baseline

- 16.6.1 The Proposed Development falls at the edge of the safeguarded area for Inverness Airport (approximately 52km and farther from the Proposed Development). The local airspace is Class G (uncontrolled airspace) up to Flight Level (FL) 195 i.e. 19,500 feet and Class C (controlled airspace) above FL195.
- 16.6.2 The Proposed Development is also within the MOD Low Flying Area 14 which is designated as a low priority military low flying area. There is a MOD airfield radar 92km from the closest point of the Proposed Development at Royal Air Force Lossiemouth.
- 16.6.3 There are three NERL PSR facilities within the wider area: Perwinnes (136km from the Proposed Development), Allanshill (145km from the Proposed Development) and Tiree (162km from the Proposed Development).
- 16.6.4 The closest MOD Air Defence (AD) radars are at Buchan (159km) and Benbecula (185km).
- 16.6.5 There are no met office radars or helicopter landing sites within the wider area, therefore these are not considered further in the assessment.
- 16.6.6 There is a glider soaring site along a ridgeline lying approximately 8km to the south of the Proposed Development at its closest point. The ridgeline is approximately 13km in length.

16.7 Potential Effects

- 16.7.1 This section describes the potential effects on aviation which could result from the construction, operation and decommissioning of a wind farm. Inclusion here does not imply that they would occur, or be significant at the Proposed Development, only that they have been considered. Mitigation measures to reduce potential effects are described in Section 16.8 (Mitigation) with an assessment of residual effects, i.e. those remaining after the implementation of mitigation, provided in Section 16.9 (Residual Effects).
- 16.7.2 Turbines have the potential to act as physical obstructions to low flying aircraft at, or close to, an aerodrome or other aviation activity site.
- 16.7.3 Turbines can be detected by radars, resulting in radar clutter being presented on a radar display used by air traffic controllers. Radar clutter can affect the safe and efficient

provision of air traffic services as it can obscure actual aircraft and/or cause the track of an aircraft under control to be incorrectly reported.

- 16.7.4 An assessment of RLoS using the ATDI ICS telecom EV software modelling tool has shown that, for turbines with a maximum tip height of 149.9m above ground level (AGL), the Proposed Development is not in RLoS of the PSR at Inverness Airport. Probability of Detection calculations confirm that the turbines are highly unlikely to be detected by Inverness PSR.
- 16.7.5 An assessment of RLoS has also shown that turbines with a maximum tip height of 149.9m AGL within the site boundary are not in RLoS of Lossiemouth PSR, any MOD AD radars or any NERL PSRs. No effects on these radars are anticipated and this analysis is supported by the fact that neither aviation stakeholder objected to the turbine locations during Scoping.
- 16.7.6 The Proposed Development lies within an area which is deemed a low priority military low flying area by the MOD; however, it is likely that pilots of low flying aircraft would require visual cues denoting the location and proximity of the Proposed Development.
- 16.7.7 There is a 13km ridgeline which is used for glider soaring to the south of the Proposed Development. The ridgeline is between 8km and 16km from the closest turbines. CAP 764 advises that the British Gliding Association (BGA) and relevant gliding sites be consulted about proposed wind developments within 10km of any chartered glider launch site. The closest BGA gliding club to the Proposed Development is the Cairngorm Gliding Club based at the Blackmill Airstrip near Feshiebridge which is approximately 28km to the east. There is likely to be no impact on the continued use of the ridgeline for glider soaring in the presence of the Proposed Development.

16.8 Mitigation

- 16.8.1 No effects are anticipated on civil aviation facilities.
- 16.8.2 The Proposed Development is within a low priority military low flying area; however, it is anticipated that the MOD would request a suitable lighting scheme. MOD Obstruction Lighting Guidance indicates a requirement of 25 candela / infrared combi lighting on cardinal turbines and 25 candela or infrared lighting on the remaining perimeter turbines.
- 16.8.3 Following the implementation of mitigation there would be no effects on aviation or radar operations as a result of the Proposed Development.

16.9 Residual Effects

- 16.9.1 There would be no residual effects on aviation provided any mitigation agreed with the MOD is implemented.

16.10 Cumulative Effects

- 16.10.1 Through the use of mitigation such as effective lighting the cumulative effects from the creation of an obstacle environment would not be significant.
- 16.10.2 No part of the Proposed Development is likely to be detected by any radar, thus presenting no cumulative effect with any other wind farms in the vicinity.

16.11 Conclusion

- 16.11.1 From the consultation and analysis undertaken it is concluded that, provided a suitable aviation lighting scheme agreed with the MOD is implemented, the Proposed Development would not have an effect on aviation as a physical obstruction.
- 16.11.2 Radar modelling confirms that no part of the Proposed Development is likely to be detected by any civil or military radar, therefore radar clutter would not be an issue.
- 16.11.3 No significant effects have been identified in the assessment of aviation issues.

16.12 References

Scottish Government (2017) Onshore Wind Policy Statement, January 2017, Available online: https://consult.gov.scot/energy-and-climate-change-directorate/draft-onshore-wind-policy-statement/user_uploads/final-version-23-january.pdf [accessed 20 Feb. 2020];

Civil Aviation Authority (CAA) (2016) CAP 764 – Policy and Guidelines on Wind Turbines, 6th Edition, February 2016, Available online: <https://publicapps.caa.co.uk/docs/33/CAP764%20Issue6%20FINAL%20Feb.pdf> [accessed 20 Feb. 2020];

Civil Aviation Authority (CAA) (2020) CAP 032 – UK Aeronautical Information Publication (AIP), Available online: <https://www.aurora.nats.co.uk/htmlAIP/Publications/2020-01-30-AIRAC/html/index-en-GB.html> [accessed 20 Feb. 2020];

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Ministry of Defence (MOD) (2020) UK Military AIP, Available online: <https://www.aidu.mod.uk/aip/aipVolumes.html> [accessed 20 Feb. 2020];

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