Chapter 12 Telecommunications, Aviation & Radar

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12. Telecommunications, Aviation & Radar

12.1 Executive Summary

12.1.1 This chapter assesses the potential effects of the construction, operation and decommissioning of the turbine of the Proposed Development on telecommunications, aviation and radar.

12.1.2 The telecommunications assessment as informed by current guidance and legislation has been undertaken through consultation with the appropriate consultees.

12.1.3 A review of the telecommunication links and consultation with telecommunication providers showed a BT link crossing the site. The design iteration process has considered the location of this link and no infringements will occur. No effects from the construction, operation or decommissioning of the proposed turbine were therefore identified.

12.1.4 The proposed turbine will not impact any telecommunication links, and will not have any cumulative effects on telecommunication links with other developments.

12.1.5 The requirement is for the Proposed Development to have no significant residual impacts on aviation infrastructure. This is addressed through consultation with all relevant stakeholders within the consenting process. In addition the Applicant has independently assessed the potential impacts.

12.1.6 The impact assessment scoping process involved considering all military and civil aerodromes in the wider area out to circa 60 km, all radar installations out to the limit of their range, all navigational aids, air-ground-air communications stations and low flying activities.

12.1.7 NATS, Airtask Lerwick/Tingwall Airport), Highlands and Islands Airports Limited (HIAL, specifically Sumburgh Airport) and the Ministry of Defence (MoD) were identified as relevant stakeholders.

12.1.8 NATS and Airtask have raised no objections. HIAL has raised no objections, subject to an Instrument Flight Procedure impact assessment for Sumburgh Airport showing no impacts.

12.1.9 The MoD scoping response has raised concerns about impacts to the Saxa Vord air defence radar and to low flying operations. It is important to appreciate that the MoD process of responding to scoping submissions is not the same as the process for responding to a full planning application. Scoping responses exclude an operational impact assessment by subject matter experts within the MoD. Neither of the issues which raised concerns are expected to generate objections at full submission.

12.1.10 There are no apparent aviation impacts. A requirement from the MoD to fit MoD accredited infra-red obstruction lighting is anticipated and will be met.

12.1.11 The Battery Energy Storage System (BESS) element of the Proposed Development does not have the ability to impact telecommunications or aviation and therefore is not discussed further within this chapter.

12.2 Telecommunications

Introduction

12.2.1 This section considers the potential effects of the Proposed Development on existing and planned telecommunications and television infrastructure, both within the site and in the wider area, during construction, operation, and decommissioning. The Battery Storage Energy System (BESS) does not have the ability to impact telecommunication links and therefore has not been considered within the telecommunications assessment.

12.2.2 Wind turbines, like any other large structure, have the potential to interfere with electromagnetic signals, which are used in a variety of communications. Relevant infrastructure given consideration included telecommunication links and microwave links.

12.2.3 The Office of Communications (Ofcom) is the regulator for the UK communications industries and, under the *Wireless Telegraphy Act 2006*, is responsible for dealing with any complaints regarding interference to television, radio or telecommunications. Operators of electromagnetic links will ascribe a safeguarding buffer zone around their transmitters and line of sight pathways to ensure that they remain unobstructed. Consequently, individual telecommunication providers/operators have been consulted as part of this assessment.

12.2.4 This assessment has assessed the design as described in **Chapter 3**. For the purpose of this assessment, it has been assumed that the Proposed Development turbines will not exceed 149.9m to blade tip. In addition, the candidate turbine that has been used to inform the assessment has a hub height of 82 m and a blade length of 68 m. It is recognised that turbine selection will be subject to commercial tendering and availability and the specific parameters of hub height and rotor diameter may therefore vary; it is however unlikely that a change to the hub height or rotor diameter from that assessed would result in a material change in the findings of the assessment.

Legislation, Policy and Guidelines

12.2.5 The assessment has been informed by relevant legislation, policy and guidelines, details of which are noted below:

- Wireless Telegraphy Act (2006);
- The Shetland Local Development Plan (Shetland Islands Council, 2014);
- Planning Advice Note: PAN 62 Radio Telecommunications (2001); and
- Tall structures and their impact on broadcast and other wireless services (Ofcom 2009).

12.2.6 The potential impacts as a result of the Proposed Development have been assessed with reference to the above documents.

Consultation

12.2.7 Consultation was undertaken with relevant statutory and non-statutory stakeholders to identify any fixed wireless links or scanning telemetry links in the area, and a summary of their responses is set out in **Table 12.1** below.

Table 12.1 Telecommunications Consultation

Consultee	Consultation Response	Applicant Action
Airwave Solutions	No response received.	N/A.
Arqiva (5th November 2021)	No objection.	No action required.
Atkins Global (4th November 2021)	No objection.	No action required.
BT (November 2021, December 2021, February 2022, September 2022)	BT responded on 19 November 2021 objecting to the Proposed Development as there was a risk that the original development design would cause interference to the core radio link that carries all communications for the islands.	Through the design iteration process outlined in **Chapter 3**, the turbine location has been altered in order to prevent any interference.

Consultee	Consultation Response	Applicant Action
		BT confirmed that the new layout will not cause interference to BT's current and presently planned radio network. No further action is required.
EE (12th November 2021)	No objection.	No action required.
Joint Radio Company (JRC) (4th November 2021)	JRC responded on 04 November 2021 confirming that the proposal is cleared with respect to radio link infrastructure operated by Scottish Hydro (Scottish & Southern Energy) and Scotia Gas Networks.	No action required.
Vodafone (11th November 2021)	No objection.	No action required.

Assessment Methodology

12.2.8 Interference with mobile phone networks and other wireless data networks can occur through the interference of microwave and UHF band fixed links. These are operated by or on behalf of the mobile service providers, the utility companies, the emergency services and occasionally by small private networks.

12.2.9 The impact assessment has been conducted through consultation with the operators of these networks to identify potential impacts and residual impacts, and then goes on to determine appropriate mitigation measures.

Baseline Conditions

12.2.10 The baseline was established through consultation as detailed in **Table 12.1** above. This process identified one link located within the site operated by BT, who are a broadband and mobile service provider.

12.2.11 **Figure 12.1** shows the location of the BT telecommunications link and associated buffer.

12.2.12 Consultation with BT was undertaken to establish the precise location of the telecommunication link and it was determined a 112 m clearance from the turbine blade tip to the telecommunications link would be required to ensure no interference between the Proposed Development and the telecommunication link would occur.

Potential Effects

12.2.13 As BT ran an interference analysis on the Proposed Development the appropriate clearance buffer was identified. The Proposed Development was designed to ensure there was no interference on the BT telecommunications link. No other telecommunication links have been identified close to the Proposed Development. Therefore, based on the final Proposed Development design, no effects have been identified and no mitigation is required.

Mitigation

12.2.14 The design iteration process considered any potential impacts on telecommunications and therefore all mitigation is embedded.

Cumulative Effects

12.2.15 As the Proposed Development will not impact any telecommunications links, the Proposed Development will not have any cumulative effects on telecommunication links with other developments.

Conclusion

12.2.16 This section has considered the potential effects of the Proposed Development on existing and planned telecommunications infrastructure.

12.2.17 The telecommunications assessment, as informed by current guidelines and legislation, has been undertaken through consultation with the appropriate consultees, namely:

- Arqiva;
- Atkins;
- BT;
- EE;
- JRC; and
- Vodafone.

12.2.18 The consultation process identified one telecommunications link located within the site boundary operated by BT. **Figure 12.1** shows the location of the telecommunications link. The Proposed Development has been designed to avoid any impacts on BT telecommunication link. Therefore, no effects from the construction, operation or decommissioning of the Proposed Development were identified. Additionally, there will be no cumulative effects on telecommunications.

12.3 Aviation

Introduction

12.3.1 This chapter considers the potential effects of the Proposed Development on existing and planned military and civil aviation activities, including those resulting from impacts to radar. Other potential effects result from the physical presence of the turbines as obstacles, and effects on navigational aids and radio communication stations. The BESS does not have the ability to impact telecommunication links and therefore has not been considered within the telecommunications assessment.

12.3.2 Radio waves are used in a variety of surveillance and communication systems within aviation and any large structure has the potential to interfere with their broadcast and reception. The potential of a structure to affect the propagation of radio waves is principally dependent upon the size, shape and materials of construction. The blade rotation can cause turbines to show up on radar, which are specifically designed to detect movement. Whilst turbines can impact radar, whether or not this generates significant operational effects depends upon both the use of the radar and of the airspace above the Proposed Development.

12.3.3 The potential effects are highly dependent on the location of the wind farm and on the positions of the individual turbines. In some cases, there are no significant consequences and no mitigation is required, whilst in other cases the turbine specification or layout must be designed to accommodate local infrastructure. Mitigation is often available and appropriate to manage impacts.

Legislation, Policy and Guidelines

12.3.4 The relevant sections of key policy and guidance documents are described below, which together place a responsibility on the planning authorities and the Applicant to assess potential impacts on aviation.

Planning Policy

Scottish National Planning Framework (NPF4, 2023)

12.3.5 NPF4 Policy 11, part e (iv) notes that project design and mitigation should demonstrate how impacts on aviation and defence interests are addressed".

Scottish Onshore Wind Policy Statement (December 2017)

12.3.6 Within the Scottish Onshore Wind Policy Statement, under Chapter 4, Barriers to Deployment, it is noted wind developments can impact significantly on civil air traffic control primary radar systems because they appear as clutter on radar displays, potentially obscuring aircraft flying above them from view. This is a common factor in creating delay and cost to wind power developments.

Onshore Wind Policy Statement Refresh 2021: Consultative Draft (October 21)

12.3.7 Within the Onshore Wind Policy Statement Refresh 2021, under Section 3.3 Aviation Lighting, the document notes that Aviation lighting is becoming a more prominent issue, one which could have a significant effect on the development of onshore wind. It further notes that work is underway on technical and airspace-related solutions and that The Scottish Government has set up a short-term working group (anticipated lifespan of 18-24 months) to consider this issue and, ultimately, to deliver practical and consistent guidance to aid both the renewables sector and decision makers in assessing these impacts.

Planning Circular 2/03: Safeguarding of Aerodromes, Technical Sites and Military Explosives Storage Areas (revised March 2016)

12.3.8 This Circular summarises the Scottish Ministers' understanding of the general effect of the relevant primary or secondary legislation.

12.3.9 It contains four annexes. Annexes 1 and 2 describe the formal process by which planning authorities should take into account safeguarding, including in relation to wind energy developments. Annex 3 lists officially safeguarded civil aerodromes and Annex 4 lists planning authority areas containing civil en-route technical sites for which separate official safeguarding maps have been issued.

12.3.10 The Circular also refers planning authorities, statutory consultees, developers and others to CAA CAP 764 (CAA Policy and Guidance on Wind Turbines), which is discussed further under Guidance below, and Met Office guidelines.

12.3.11 This policy statement highlights and clarifies the requirements set out in CAP 393, the Air Navigation Order, for the lighting of onshore turbines. Key sections are described further under the assessment methodology below.

Guidance

CAP 764: CAA Policy and Guidance on Wind Turbines (Feb 2016)

12.3.12 CAA guidance within CAP 764, sets out recommended consultation and assessment criteria for the impacts of wind turbines on all aspects of civil aviation.

12.3.13 The CAA involvement in the Wind Farm Pre-Planning Consultation Process ceased on 25 December 2010. CAP 764 now states that "developers are required to undertake their own pre-planning assessment of potential civil aviation related issues."

12.3.14 Within CAP 764 the CAA provides a chapter describing the "wind turbine development planning process", within which the main civil aviation stakeholders and their interests are listed and

described in brief. Table 1 within the guidance document provides an overview of considerations and the following paragraphs detail what developers will need to consider, conducting associated consultations as appropriate.

12.3.15 The CAA observes in section 2.36 that impact on communications, navigation and surveillance infrastructure alone is not sufficient to support an objection; rather those impacts need to have a negative impact on the provision of an air traffic service.

12.3.16 The CAA notes in section 5.25 of CAP 764 that "it is incumbent upon the developer to liaise with the appropriate aviation stakeholder to discuss – and hopefully resolve or mitigate – aviation related concerns without requiring further CAA input. However, if these discussions break down or an impasse is reached, the CAA can be asked to provide objective comment".

12.3.17 Section 5.26 of CAP 764 states that "the CAA will not provide comment on MoD objections or arguments unless such comments have been requested by the MoD."

Consultation

12.3.18 **Table 12.2** provides details of consultations undertaken with relevant regulatory bodies, together with action undertaken by the Applicant in response to consultation feedback.

Table 12.2 – Consultation Responses

Consultee	Consultation Response	Applicant Action
NATS (December 2021)	No objection	No action required
MoD (9th December 2021)	The MoD may have concerns about the proposal. The turbines will be 73.6 km from and detectable by the AD radar at ASACS Saxa Vord. A turbine development of the height and at the location you propose may have an impact on low flying operations	It is anticipated that the full MoD response to the submission will specify a requirement for infra-red aviation obstruction lighting to mitigate low flying impacts. If such a requirement is requested at full submission, then MoD compliant IR lighting will be fitted to the turbine. The MoD are not expected to object to the technical impacts to the Saxa Vord air defence radar, once the operational impact assessment has been conducted. In the unlikely event that an objection is raised, the Applicant will engage with the MoD, through the DIO, to agree suitable mitigation.

Consultee	Consultation Response	Applicant Action
HIAL (1st February 2022)	If the IFP impact assessment shows that there is no impact then HIAL/Sumburgh would not object to a planning proposal on the grounds of a potential PSR LoS impact	An Instrument Flight Procedure (IFP) impact assessment will be completed through HIAL.
Airtask (26th January 2022)	The pilots operating the Shetland Inter Island Service from Lerwick/Tingwall have no objection to the Proposed Development and neither does Airtask as an organisation.	No action required.

Assessment Methods and Significance Criteria

12.3.19 The requirement is for the Proposed Development to have no significant residual impacts on aviation infrastructure. This is addressed through consultation with all relevant stakeholders within the consenting process. The task of the Applicant is to independently assess the potential effects and where significant effects may occur, to enter a dialogue with the affected stakeholders prior to submission as far as is possible. Whilst the aim of this pre-submission dialogue is to elicit the approval of all stakeholders, typically solutions are identified but do not reach full maturity in terms of the assessment by the stakeholders and the contracting of mitigation where required. The stakeholders consider dialogue a higher priority and more meaningful once design iterations are completed and a live application exists.

Study Area

12.3.20 The scoping process involves considering all military and civil aerodromes in the wider area out to circa 60 km, all radar installations out to the limit of their range, all navigational aids, air-ground-air communications stations and low flying activities.

Desk Study

12.3.21 An initial scoping study identified those stakeholders potentially affected by the Proposed Development. The desk based assessment included a review of the following:

Airspace environment

- Proximity to all aerodromes;
- Airspace class - Proximity to ATS routes;
- Transponder Mandatory Zones (TMZs), Areas of Intense Aerial Activity, Control Areas, restricted areas etc.; and
- Proximity to military training areas.

Checks for physical obstruction

- through an infringement of obstacle limitation surfaces; and
- potential for penetration of Instrument Flight Procedure safeguarding surfaces.

Radar Line of Sight analysis for the following radars

- NATS En-route primary and secondary radar;
- Civil and military aerodrome air traffic control radar;
- Military precision approach radar;
- Military Air Defence radar; and
- Weather radar.

Proximity to other technical sites

- Navigational aids such as beacons; and
- Air-ground-air comms stations operated by NATS En-Route.

Baseline Conditions

12.3.22 The Proposed Development lies 4.3 km east of Lerwick/Tingwall Aerodrome and 35km north of Sumburgh Airport. It is outside of the Sumburgh Airport airspace, not underneath any lower airspace air traffic service routes. Sumburgh serves the offshore oil and gas industry and the helicopter main routes (HMRs) to the offshore platforms, all route to the east of the site.

12.3.23 The Proposed Development is visible to the primary radar at Compass Head and to the air defence radar at Saxa Vord. It is remote from all navigational aids and radio communication stations. It lies underneath airspace classified as of low priority for military low flying.

12.3.24 The scoping process identified NATS, Airtask (Lerwick/Tingwall Airport), HIAL (Sumburgh Airport) and the MoD as relevant stakeholders.

Lerwick/Tingwall Aerodrome

12.3.25 The aerodrome is owned by the Shetland Islands Council, operated under contract by Airtask Group Limited. Airtask have registered a no objection in their scoping response.

12.3.26 The site is beyond all obstacle limitation surfaces for this aerodrome. The aerodrome is visual only with no instrument approach procedures. There are therefore no impacts on this aerodrome at this range and direction.

Sumburgh Airport

12.3.27 The airport is owned and operated by HIAL. Approach and Approach Radar Services for Sumburgh Airport are provided by NATS from Aberdeen, using the Compass Head radar. However, HIAL intend to take over the service and provide it from Inverness.

12.3.28 NATS has provided a no objection response and HIAL has stated that provided an Instrument Flight Procedure (IFP) impact assessment shows that there is no impact then HIAL/Sumburgh would not object to a planning proposal. The Applicant has requested the IFP impact assessment to be undertaken but the instruction via HIAL was not completed at the time of submission.

MoD

12.3.29 The MoD scoping response has raised concerns about impacts to the Saxa Vord air defence radar and impacts to low flying operations. These issues are not expected to remain of concern at full submission. It is important to appreciate that the MoD process of responding to scoping submissions is not the same as the process for responding to a full planning application. The scoping response is

derived by reference to maps alone, which highlight potential issues for a location, but which exclude an operational impact assessment by subject matter experts within the MoD. This is due to resource limitations.

12.3.30 There are technical impacts to the Saxa Vord air defence radar. The turbine is visible to this radar and is likely to be detectable, resulting in occasional returns being displayed and a slight reduction in the probability of detection of aircraft flying above the site. The operational significance of these impacts is entirely dependent upon the location. In fact, the MoD has not objected to most onshore wind energy developments with air defence radar impacts and currently has a record of not objecting to onshore developments of a few turbines only. Each case is assessed individually and there are no overlying rules concerning the number of turbines that would be acceptable. In this case, as a single turbine application, it would be very unusual for the MoD to object in the light of the operational assessment. In the event of the scoping concerns becoming an objection, the applicant will engage with the MoD to consider mitigation. Because this is unlikely and because the MoD will not resource an operational assessment or engage further at the scoping stage, mitigation discussions have not been initiated.

12.3.31 The MoD has raised low flying impacts as a concern because the site lies in an area that does not exclude military low flying. This scoping response is automatic for any site where low flying is not explicitly excluded. Only major airport terminal areas exclude military low flying. The remainder of the country is divided into areas of low, medium and high priority for low flying. The site lies in a low priority area. The MoD has not objected to any sites Wind Business Support has worked on, as a result of impacts to low flying, in a low priority area. It does usually request infra-red obstacle lighting to enable the turbines to be identified at night by pilots flying low, visually, using night vision goggles. Hence the expectation for this site is no objection, with a requirement for the fitting of infra-red obstacle lighting. Infra-red lighting is not visible to the human eye. If requested, it will be fitted in accordance with MoD requirements.

Standard Mitigation

12.3.32 If confirmed as a requirement by the MoD, the turbine will be fitted with infra-red aviation obstacle lighting, meeting MoD requirements, to mitigate impacts to military low flying at night. The infra-red lighting is not visible to the human eye.

Potential Effects

12.3.33 No outstanding aviation impacts are anticipated. Subject to an outstanding Instrument Flight Procedure impact assessment for Sumburgh Airport, all aviation stakeholders are expected to approve the Proposed Development.

12.3.34 There are no cumulative effects. The aviation stakeholders take account of cumulative impacts in their assessment of the acceptability of the Proposed Development. There will be no residual effects.

Conclusion

12.3.35 There are no aviation impacts apparent. A requirement from the MoD to fit MoD accredited infra-red obstruction lighting is anticipated and will be met. This requirement can be appropriately secured, if applicable, through an appropriately worded planning condition.

12.4 References

Civil Aviation Authority (Feb 2016). CAP 764: CAA Policy and Guidelines on Wind Turbines.

Civil Aviation Authority (Feb 2021). CAP 393: The Air Navigation Order 2016 (ANO) and Regulations.

Civil Aviation Authority (Jun 2017). Policy Statement - Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level.

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