

## 7. AVIATION AND TELECOMMUNICATIONS

### Executive Summary

The ES and ES Addendum determined that the consented Viking Wind Farm would have no significant effects on existing telecommunications and microwave links following the application of mitigation measures. The same mitigation measures would be implemented for the proposed varied development, which will ensure no significant effects on existing telecommunications and microwave links. On this basis there is no difference in the effects associated with the consented Viking Wind Farm and the proposed varied development.

The Applicant engaged in detailed consultation with Scatsta Airport owners, licensee and operators as part of the development of the consented Viking Wind Farm layout regarding mitigation for the potential significant effects on aviation operations at the airfield. Following consultation and through the determination of the relevant section 36 consent, turbines are no longer proposed for the Delting quadrant. As a result, the consented Viking Wind Farm, subject to the compliance with relevant conditions of the consent, would have no significant effect on operations at Scatsta Airport. The proposed varied development would introduce an additional requirement for aviation lighting. Current regulations<sup>1</sup> requires 'en-route obstacles' taller than 150 m to be provided with aviation lighting scheme. The Applicant would seek to agree suitable lighting scheme with the planning authority in consultation with the Scatsta Airport Operator and the Civil Aviation Authority (CAA) as part of agreeing an Aviation Mitigation Scheme<sup>2</sup>. On the basis that the proposed varied development would also comply with the pre-commencement condition<sup>3</sup>, there would be no significant effects on aviation operations, and there would be no difference between the consented Viking Wind Farm and the proposed varied development.

The ES Addendum included a television impact report to consider the potential for radio and television reception interference. This study was completed prior to the digital switch over, which took place in 2010. At that time the only digital transmitter was Bressay, however it discussed the anticipated relay transmitter arrangements. Overall, the study identified that there was a potential for signal interference to homes on the western edge of the island from Aith to Voe and across to Collafirth (approximately 300 homes), however it considered that digital signals are less susceptible to impact. The report also noted that most of the affected dwellings would currently use a satellite for television due to the poor distribution of analogue signal. Following mitigation, and assuming compliance with condition 50 of the relevant section 36 consent<sup>4</sup>, no significant effects were identified for the consented Viking Wind Farm. Based on implementing the same mitigation, no significant effects on television or radio reception are identified for the proposed varied development and there would be no difference between the consented Viking Wind Farm and proposed varied development.

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<sup>1</sup> The Air Navigation Order 2016, URL: <http://www.legislation.gov.uk/uksi/2016/765/contents/made>

<sup>2</sup> As required under the existing condition 7 (Annex 2, part 1) of the relevant section 36 consent.

<sup>3</sup> *Ibid.*

<sup>4</sup> Condition 50 (Annex 2, part 2) of the relevant section 36 consent

## 7.1 Introduction

7.1.1 This chapter considers the potential significant effects on aviation, telecommunications and television/radio reception associated with the construction, operation and decommissioning of the proposed varied development. The specific objectives of the chapter are to:

- describe the baseline;
- summarise the assessment methodology and significance criteria used in completing the impact assessment;
- describe the likely significant effects of the consented Viking Wind Farm, based on the conclusions of the ES and ES Addendum and other information sources;
- provide an assessment of the likely significant effects of the proposed varied development;
- describe the mitigation measures proposed to address likely significant effects; and
- describe the residual effects for the proposed varied development and how these differ from the effects reported for consented Viking Wind Farm.

7.1.2 This chapter has been prepared by Ramboll Environment and Health UK Limited (Ramboll).

7.1.3 The chapter is supported by:

- Technical Appendix 7.1: Television Impact Report.

7.1.4 Figure 7.1 has been referenced where relevant.

## 7.2 Assessment Methodology and Significance Criteria

### *Scope of the Assessment*

7.2.1 Due to the size and nature of wind turbines, they have the potential to interfere with electromagnetic signals passing above ground during operation, or existing infrastructure buried below ground during construction. Infrastructure can include telecommunication links, microwave links, television reception, and civil and military aviation operations, including impacts on radar and utilities. In addition, the nature of the proposed wind turbines can result in them posing obstacles to aviation operations.

7.2.2 The assessment has taken account of previous scoping responses from relevant bodies as well as existing and current policy relevant to telecommunications and aviation issues/infrastructure likely to be affected by the consented Viking Wind Farm and the proposed varied development.

### *Policy Context*

7.2.3 Since the ES and ES Addendum were published, the Civil Aviation Authority (CAA) has released the sixth edition of 'CAA Policy and Guidelines on Wind Turbines - CAP 764<sup>5</sup>' which updates and replaces all previous versions. The June 2017 policy statement<sup>6</sup> by the CAA clarifies the requirements for lighting onshore wind turbines equal to or over 150 m in height. The policy statement describes a scenario with a red light fitted as close as possible to the top of the fixed structure, i.e. the nacelle, and additional lights to provide 360° coverage at half of the nacelle height.

### *Consultation*

7.2.4 A consultation process was carried out as part of the EIA process associated with the ES, with further consultation responses detailed in the ES Addendum. This assessment has comprised a desk-based review of available information and previous consultation responses with all relevant

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<sup>5</sup> The Air Navigation Order 2009 has since been superseded by the Air Navigation Order 2016 (CAP 393).

<sup>6</sup> 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

statutory bodies and service providers. The relevant consultees and their previous comments are listed in Table 7.2.

- 7.2.5 No new aviation and telecommunication consultation has been carried out for this EIA Report. Instead this EIA Report is intended to provide aviation and telecommunication consultees with sufficient information to provide, if required, updated consultation responses in relation to the proposed varied development.

### ***Significance Criteria***

- 7.2.6 For the purpose of this study the significance of effects has been measured by classifying each impact as being in one of the following categories: negligible, minor, moderate or major (Table 7.1). It is assumed that all identified effects of the proposed wind farm on communications links etc. are adverse. Moderate and Major effects would be considered significant.

<b>Significance</b>	<b>Definition</b>
Negligible	Very small or no effect. No need for further consideration.
Minor	Small effects. Unlikely to need further consideration but reasons for elimination of the effect and mitigation measures have been considered.
Moderate	Medium effects. Need further consideration and the development of appropriate mitigation measures.
Major	Severe effects. Require alterations to project design or appropriate mitigation measures.

## **7.3 Baseline Conditions**

### ***Telecommunications Baseline***

- 7.3.1 Consultation with providers of telecommunication links in Shetland confirmed the potential for impact upon an SSE microwave communication link (link 13104). Since the Link 13104 is an SSE microwave link the company will look to move the link transmitter to a more suitable location which will avoid interference. The consented Viking Wind Farm (and the proposed varied development) would have an internal fibre optic communications network that can be used to re-route signals from the affected antenna to a new antenna location as agreed by the link operator. A second SSE link is predicted to be affected by turbine induced interference; however, SSE have confirmed that this link not being used and is no longer required. The licence for this link is to be returned to Ofcom.
- 7.3.2 T-Mobile also initially objected to two turbines which may affect one of its telecommunications links, however subsequently confirmed that micro-siting of these two turbines resolved their issue.
- 7.3.3 On this basis there are no sensitive telecommunications links and therefore no potential for significant effect associated with either the consented Viking Wind Farm or the proposed varied development.

### ***Aviation Baseline***

- 7.3.4 The site is located on Mainland Shetland. At the southern-most tip of the mainland is Sumburgh Airport which accounts for most of the aviation traffic on the island and carries most commercial flights. Consultation (summarised in Table 7.2) and previous assessment confirmed that Sumburgh Airport would not be sensitive to the consented Viking Wind Farm (or the proposed varied development) based on the distance from the site.

- 7.3.5 In the centre of the mainland, and to the south of the proposed varied development, is Tingwall airstrip which is a small private airstrip servicing mainly short-hop flights from Mainland Shetland to the outlying islands. The operators of Tingwall airstrip confirmed that the consented Viking Wind Farm would not impact on their operations during previous consultation.
- 7.3.6 Finally, Scatsta Airport is located to the north of the consented Viking Wind Farm and proposed varied development. Scatsta airstrip is a commercial airstrip servicing the oil and gas fields surrounding the islands (Figure 7.1).
- 7.3.7 An objection was received to the ES and ES Addendum from Serco Defence and Aerospace (now Serco Defence Science and Nuclear) who are the Licensee’s Representative for Scatsta airfield. The objection related to a number of the turbines in the Delting quadrant adjacent to the airfield. A detailed consultation with Scatsta Airport was held following the objection and a number of turbines were removed from the proposed development to address their concerns. Scottish Ministers subsequently determined that all of the 24 turbines in the Delting Quadrant would need to be deleted due to the associated aviation issues but were of the view that the remaining 103 turbines could be consented as these were not the subject of an objection by Scatsta Airport<sup>7</sup>. The existing Section 36 consent was therefore granted for the remaining 103 turbines, i.e. the consented Viking Wind Farm, subject to a condition<sup>8</sup> that requires an Aviation Mitigation Scheme to be submitted and approved by Scottish Ministers in consultation with the Planning Authority and the Airport Operator.

**Television and Radio Reception Baseline**

- 7.3.8 The ES Addendum included a television impact report to consider the baseline for radio and television reception quality and the potential for interference caused by the wind farm. This study was completed prior to the digital switch over, which took place in 2010. At that time the only digital transmitter was Bressay, however it discussed the anticipated relay transmitter arrangements. Overall, the study identified that there was a potential for signal interference to homes on the western edge of the island from Aith to Voe and across to Collafirth (approximately 300 homes), however it considered that digital signals are less susceptible to impact. The report also noted that most of the affected dwellings would currently use a satellite for television due to the poor distribution of analogue signal.

**Summary of Sensitive Receptors**

- 7.3.9 Based on the baseline review this impact assessment includes a further review of:
- Potential aviation effects focussed on Scatsta Airport; and
  - Television Reception.
- 7.3.10 No further assessment of telecommunication links is considered necessary at this stage.
- 7.3.11 Table 7.2 provides a brief description of the issues raised through consultation on the ES and ES Addendum.

<b>Table 7.2: Consultees</b>	
<b>Provider</b>	<b>Outcome</b>
AIRWAVE	No response received.
ARQIVA	Supplied link data in the area. None is within or near the windfarm location.
BT	No Objection.

<sup>7</sup> Page 9 of the decision of the Scottish Ministers dated 4 April 2012 granting the relevant section 36 consent and deemed planning permission.

<sup>8</sup> Condition 7 (Annex 2, part 1) of the relevant section 36 consent

<b>Table 7.2: Consultees</b>	
CAA	No Objection. Advised that there was potential for a number of turbines to impact upon Scatsta Airport instrument flight procedures and that it was essential that the views of Scatsta Airport were established.
CSS	No Objection.
HIAL	No Objection.
JRC	Provided an objection on behalf of SSE (electricity distribution in Shetland) for several microwave links and scanning telemetry (see ‘SSE’ below).
MoD	No Objection.
NATS	No Objection.
OFCOM	Provided a list of microwave link service providers.
SCATSTA AIRPORT	Objection. A detailed consultation with Scatsta Airport was held following the objection and a number of turbines were removed from the development to alleviate their concerns.
SSE	Objection to link 13104. SSE has a 50% stake in the consented Viking Wind Farm. Therefore, a solution will be found within the company. A scanning telemetry link also passes through part of the development; the licence for this link is being returned to Ofcom in the very near future so will not cause any further issues.
SUMBURGH AIRPORT	No Objection.
THUS	No response received.
TINGWALL AIRPORT	No Objection.
T-MOBILE	T-Mobile objected to two turbines which may affect one of its telecommunications links. Further information has been provided and T-Mobile has responded that the micrositing of turbines should resolve their issue.

## 7.4 Assessment of Effects

### ***Aviation – consented Viking Wind Farm***

#### *Radar*

- 7.4.1 The effects of reflecting, refracting or masking signals can have negative impacts on radar equipment used by local airfields and by National Air Traffic Service (NATS) En Route Plc (NERL) which manages air traffic in the airspace above the UK. There are two radars at or near the proposed varied development, one at Scatsta Airport and one at Sumburgh Airport. Serco operates Scatsta Airport with approach radar services provided by NATS Services Ltd (NSL). Sumburgh Airport is operated by Highland and Islands Airports Ltd. (HIAL) and approach services are also provided by NSL.
- 7.4.2 Sumburgh Airport previously raised no objection to the consented Viking Wind Farm.
- 7.4.3 Mitigation (and conditions related to the relevant section 36 consent) proposed for consented Viking Wind Farm include working with Scatsta Airport to develop an Aviation Mitigation Scheme to address any potential impacts on aviation operations at Scatsta.

#### *MoD*

- 7.4.4 The Ministry of Defence safeguarding team (MoD) was consulted as part of the EIA process associated with the ES, to determine whether there are any issues with the MoD communication

systems, air surveillance, radar, air defence radar, low flying activities or aerodrome operations radar. The site is not located within a Ministry of Defence (MoD) Low Flying Area. The MoD made no objection to the consented Viking Wind Farm, and it is anticipated that there will be no change in this position in relation to the proposed varied development. The Applicant is aware that MoD has recently (2017) reinstated an air defence radar on Saxa Vord and further consultation will be carried out with the Defence Infrastructure Organisation (DIO) on behalf of the MoD to confirm the absence of effects.

#### *Airport Operations*

- 7.4.5 There were no objections during the Section 36 consent process from Sumburgh or Tingwall Airports. An objection from Scatsta Airport led to changes to the original proposals. Scatsta Airport had no objection to the consented Viking Wind Farm subject to agreement of an aviation mitigation scheme.

#### **Aviation - Proposed Varied Development**

- 7.4.6 The proposed varied development would introduce an additional requirement for aviation lighting. Current regulations<sup>9</sup> requires 'en-route obstacles' taller than 150 m to be provided with aviation lighting scheme. The Applicant would seek to agree a suitable lighting scheme with the planning authority in consultation with the Scatsta Airport Operator and the Civil Aviation Authority (CAA) as part of agreeing an Aviation Mitigation Scheme.
- 7.4.7 On the basis that the proposed varied development would also comply with the pre-commencement conditions, it is anticipated that there would be no significant effects on radar, MoD interests or aviation operations.
- 7.4.8 It is not expected that there will be any new aviation concerns in relation to the proposed varied development. Further consultation will be undertaken with NATS/NSL and Scatsta Airport as part of the variation application.

#### **Television and Radio Reception – Consented Viking Wind Farm**

- 7.4.9 Television services in the UK are either Digital Terrestrial Television (DTT) or Satellite services. There is no Analogue Terrestrial Television in the UK, with the digital changeover having occurred on Shetland in May 2010. By their nature, the delivery of satellite television services would not be impacted upon by the operation of wind turbines unless they were located in very close proximity to properties. This is not the case for the consented Viking Wind Farm and there would be no effects on satellite TV services.
- 7.4.10 A baseline TV survey was undertaken in January 2010 prior to the digital changeover (see Technical Appendix 7.1). This survey found that homes on the western edge of the island from Aith up to Voe, and across to Collafirth, had the greatest potential to be affected by the consented Viking Wind Farm. It was predicted that up to approximately 300 homes in the area around the consented Viking Wind Farm had the potential to be affected. However, it was noted that most of these had satellite TV because of the poor distribution of terrestrial signals around the island due to the local terrain, and therefore would not be affected. DTT is also less susceptible than analogue to degradation of picture quality.
- 7.4.11 Following mitigation, and assuming compliance with condition 50 of the relevant section 36 consent<sup>10</sup>, no significant effects were identified for the consented Viking Wind Farm.

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<sup>9</sup> The Air Navigation Order 2016, URL: <http://www.legislation.gov.uk/ukxi/2016/765/contents/made>

<sup>10</sup> Condition 50 (Annex 2, part 2) of the relevant section 36 consent

### ***Television and Radio Reception – Proposed Varied Development***

- 7.4.12 The proposed varied development is expected to have the same potential to affect television and radio reception at properties as the consented Viking Wind Farm.
- 7.4.13 Based on implementing the same mitigation (as identified in condition 50), no significant effects on television or radio reception are identified for the proposed varied development.

## **7.5 Mitigation**

### ***Aviation***

- 7.5.1 The relevant section 36 consent contains a condition (Condition 7) requiring an aviation mitigation scheme in relation to Scatsta Airport. No variation has been sought to that condition, which, if the Section 36C application for variation of the consent is granted, would remain in effect. The condition prohibits construction work on Affecting Turbines without such a scheme having been approved.
- 7.5.2 In addition, as the proposed turbine tip height exceeds the 150 m threshold, a scheme of aviation lighting will be required. The Air Navigation Order (ANO) 2016 requires 'en-route obstacles' taller than 150 m to be provided with aviation lighting scheme. The Applicant would seek to agree suitable lighting scheme with the planning authority in consultation with the Scatsta Airport Operator and the Civil Aviation Authority (CAA). For the purposes of this EIA Report, it has been assumed that the lighting strategy would use medium intensity (2000 candela, cd), omnidirectional red and steady lights, mounted on the nacelle, with lower intensity (32 cd) red lights fitted to the tower at half the height of the nacelle (assumed to be at 47.5m).
- 7.5.3 It is noted that aviation lighting is assessed as likely to result in significant effects on visual amenity in the hours of darkness, when the lights are switched on (see Chapter 4: Landscape and Visual). In order to reduce this effect, the Application proposes to engage with the relevant authorities to agree a scheme of lighting, potentially including radar activated lighting, which would reduce the times at which the lighting would be required substantially and the intensity of the lighting.
- 7.5.4 The hours of operation at Scatsta airport are 07:00 – 21:00 hours (Monday to Friday), and 08:00 – 18:00 hours (Saturday and Sunday, for 'catch up' purposes). The Applicant would seek a mitigation solution that would mean no lighting outside of these operational hours. 60 – 90 flights per week are typically scheduled from Scatsta. It is reasonable to assume 12 and 18 flights per day (equating to between one flight every 47 mins to 70 minutes). In the winter months the airport is likely operate in low light and darkness for eight hours a day – (~ 6 to 10 flights). In the summer months low light operation would be restricted to around one hour per day (~1 flight).
- 7.5.5 Furthermore, it is noted that the intensity of the 2000 candela lights may be reduced to 10% of its peak intensity when the visibility exceeds 5 km under provisions issued under the terms of ANO Article 222(6), the result being that viewpoints more than 5 km from the site would only ever view the lighting at 10% of the maximum intensity.
- 7.5.6 The lighting would be specified in accordance with the technical specifications for medium intensity obstacle lights are set out in International Civil Aviation Organisation (ICAO) Standards, Annex 14 Table 6-3 and, for EASA member states such as the UK, in Table Q-3 of CS-ADR-DSN<sup>11</sup>. The ICAO and EASA specifications are identical. The specifications set out the required and recommended intensity settings for 2000 candela lights as follows:
- Required minimum average intensity at 0° elevation: 2000 cd
  - Required minimum intensity at 0° elevation: 1500 cd
  - Required minimum intensity at -1° elevation: 750 cd

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<sup>11</sup> URL: <https://www.easa.europa.eu/certification-specifications/cs-adr-dsn-aerodromes-design>

- Recommended maximum intensity at 0° elevation: 2500 cd
- Recommended maximum intensity at -1° elevation: 1125 cd
- Recommended maximum intensity at -10° elevation: 75 cd

**Television and Radio**

7.5.7 In accordance with the existing condition 50 (attached to the relevant section 36 consent), prior to the installation of the turbines, the Applicant would commission a further survey measuring existing television reception quality, which will be submitted to the Planning Authority. In the event that the proposed varied development is found to cause interference to television reception in the vicinity, following a complaint made to the Planning Authority within one year of the final commissioning, the Applicant would take whatever action the Planning Authority deem necessary to remedy such impairment and alleviate the problem, to the satisfaction of the Planning Authority.

**7.6 Residual Effects**

7.6.1 Following mitigation, no significant effects on aviation, telecommunications or television and radio are anticipated associated with the proposed varied development as summarised in Table 7.3 below.

Potential Impact	Pre-Mitigation Significance	Mitigation	Residual Impact
Interference with Scatsta Airfield	Moderate	Agreement of Aviation Mitigation Scheme.	Negligible
Aviation obstacle (structures >150 m)	Moderate	Scheme of Aviation Warning Lighting required for turbines.	Negligible
Interference with fixed telecommunications	Negligible	If any links do suffer interference, these can be re-routed using existing or new infrastructure.	Negligible
Television and radio	Moderate	Pre-construction television survey to establish post digital changeover conditions. Aerial re-routing, upgrade or free satellite television services for any affected properties.	Negligible

**Comparative Assessment of Effects**

7.6.2 Overall, this assessment concludes that there would be no significant effects on aviation operations associated with either the consented Viking Wind Farm or the proposed varied development. As such there would be no difference between the effects of the consented Viking Wind Farm and the proposed varied development.

**Cumulative Effects**

7.6.3 No other schemes with the potential to give rise to cumulative effects were identified and therefore no cumulative aviation and telecommunications effects are predicted.



## List of Figures

Figure 7.1 – Airport/airstrip locations

### References

- Civil Aviation Authority (2016) – Air Navigation Order 2016 (CAP 393)
- Civil Aviation Authority (2016) – CAA Policy and Guidelines on Wind Turbines (sixth edition) (CAP 764)
- Civil Aviation Authority (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.

### Glossary and Abbreviations

Abbreviation	Expanded Term / Definition
CAA	Civil Aviation Authority
DIO	Defence Infrastructure Organisation
DTT	Digital and Terrestrial Television
HIAL	Highlands and Islands Airports Ltd
JRC	Joint Radio Company
MoD	Ministry of Defence
NATS	National Air Traffic Services
NERL	NATS En Route Plc
NSL	NATS Services Ltd

