

# 13 Aviation and Radar

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# 13 Aviation and Radar

## 13.1 Executive Summary

- 13.1.1 This chapter has examined the difference between the impact of the 2020 Layout on aviation and radar compared with the 2019 Layout and provides an update on aviation consultation since the publication of the 2019 EIA Report. In summary the reduction in the number of turbines resulting from the removal of turbines T1, T2, T3, T4, T7 and T29, together with the reduction in turbine tip height from 200 metres to 180 metres for turbines T5, T16, T19, T20, T24, T25, T26, T27 and T28 does not result in any significant change to the overall impact on aviation and radar. It remains the case that the only primary surveillance radar (PSR) affected is the MOD Lockheed Martin TPS-77 radar located at Remote Radar Head (RRH) Saxa Vord. There is a reduction in the impact on the performance of the radar as a result of the reduced number and size of turbines but it will [be minimal in] operational terms.
- 13.1.2 When considering the aviation impact of the 2020 Layout on the small civil airport at Scatsta compared with the 2019 Layout, there is no significant difference. The impact on Scatsta remains negligible.

## 13.2 Introduction

- 13.2.1 This Chapter does not repeat the information set out in Chapter 13 of the 2019 EIA Report where that information remains valid in the context of the reduced number and size of turbines now proposed for the 2020 Layout. As such, the Supplementary Environmental Information (SEI) supplements Chapter 13 of the 2019 EIA Report and should be read in conjunction with it. This chapter also provides an update on consultation with key aviation stakeholders.

## 13.3 Response to Consultation Responses

### ***Ministry of Defence (Defence Infrastructure Organisation (DIO))***

- 13.3.1 Correspondence with DIO has continued as they are currently maintaining their objection based on the impact of the 2019 Layout on the performance of the TPS-77 air defence radar at Saxa Vord. The potential effectiveness of the Project Green Blade mitigation scheme currently under development was discussed and may in the future provide a suitable mitigation, however, more recently there has been a shift in the MOD position in relation to the acceptability of deploying an established mitigation scheme using an inbuilt capability within the TPS-77 radar to create a 'non auto initiation zone' (NAIZ). In this context, a NAIZ is a three dimensional zone within which the tracking system in the radar data processor does not initiate new tracks. This is done to avoid the radar tracker becoming confused by multiple radar returns from various turbine blades and generating spurious tracks on the radar displays. At the same time it allows established radar tracks (aircraft) initiated outside the NAIZ to continue to be tracked through the zone. This mitigation process is currently in use for a number of offshore wind farms in the North Sea on TPS-77 radars in Scotland and England. For the MOD to agree that this method of mitigation is appropriate in this location, they require a report to be submitted to DIO by SERCO Defence Ltd, who have the required technical capability and access to detailed classified information about the radar. The report assesses the capability of the radar in question to provide sufficient coverage around and above the windfarm to enable the requirement defined in the MOD 'Aviation Specification' to be fulfilled. Additionally, the report provides the technical information required to enable a NAIZ to be designed around the specific layout of the Proposed Development and assess radar performance to a specification determined by the MOD.
- 13.3.2 Unfortunately, due to factors external to this application, the MOD suspended the process of utilising SERCO reports and NAIZ's for a period of 18 months whilst the results of a radar trial were analysed. That work is now complete, and the MOD have stated that in some specific locations they

will consider a SERCO report and determine if the NAIZ design within that report will enable the required level of coverage to be maintained. The most critical factor in determining the success of a NAIZ in this context is the distance between the wind farm and the radar. In this case, as the Proposed Development is only 20 km from the radar, the probability of success is considered to be very high. In correspondence with MOD DIO, they confirmed via email dated 29/11/2019 that they would be prepared to consider the findings of a SERCO report. SERCO were instructed by the Applicant to undertake the report, which was submitted to the MOD for consideration on 06/08/2020. The report demonstrates that it is feasible to establish a NAIZ within a reasonable timeframe which would enable the MOD's coverage requirements (the Aviation Specification) to be met. Provided the MOD agree with the findings of the SERCO report; i.e. that a NAIZ would be a suitable mitigation, it will be possible to agree a suitably worded negative condition to protect the interests of the MOD and secure the withdrawal of this objection.

### ***Scatsta Airport***

13.3.3 Since the EIA report was written, Scatsta Airport has closed and is no longer an operational airfield and there is no longer any concern to address, however, for completeness the next paragraph addresses the issue they raised to demonstrate that there would have been no operational or safety impact in any case.

13.3.4 SERCO Ltd (a completely separate division to that referred to in paragraphs 13.3.1 and 13.3.2) was the contracted operator of Scatsta Airport. Their response only mentioned one specific concern, any possible impact of the turbines on the performance of the Secondary Surveillance Radar (SSR) data that was provided to them, in combination with the primary surveillance radar, located at Sumburgh, over 90km to the south of the Proposed Development. The PSR is located at Compass Head and the SSR at Fitful Head; both sensors are owned and operated by NATS who provided the data to Scatsta under contract. NATS is therefore responsible for ensuring that the sensors are unaffected by the impact of the Proposed Development. The impact of the Proposed Development on the performance of the SSR was not covered in the 2019 EIA report as it was considered unnecessary due to the fact that the distance to the SSR is over 90 km and well beyond any safeguarding distance for this type of sensor as confirmed in the NATS section below. It is also the case that there is no difference in the impact of the 2020 Layout in comparison with the 2019 Layout for either the PSR or SSR. In both cases the impact is negligible.

### ***Tingwall Airport***

13.3.5 Tingwall Airport was not mentioned in Chapter 13 of the 2019 EIA report as it is over 55 km to the south of the Proposed Development. The recommended consultation distance for a wind farm from this type of aerodrome is 17 km. However, Tingwall were consulted in relation to the 2019 application on a precautionary basis and confirmed on 25 July 2019 that they had no comments to make.

### ***National Air Traffic Services (NATS)***

13.3.6 As mentioned in para 13.3.3, NATS own and operate the PSR and SSR at Sumburgh Airport on behalf of Highlands and Islands Airports Ltd. They were consulted in relation to the 2019 EIA report and confirmed that the Proposed Development did not conflict with their safeguarding criteria. Further consultation with NATS in relation to the Scatsta concern about the SSR confirmed that there is no requirement to assess the impact of a wind farm on an SSR beyond 16 km. NATS directed the Applicant to the relevant guidance which is contained within EUROCONTROL-GUID-0130 (EUROCONTROL Guidelines for Assessing the Potential Impact of Wind Turbines on Surveillance Sensors) Para 4.2.2 shown below, which confirms that for any type of SSR an assessment beyond 16 km is not required. NATS confirmed that they apply this criteria at the Fitful Head SSR. It is also the case that there is no difference in the impact of the 2020 Layout in comparison with the 2019 Layout for either the PSR or SSR. In both cases the impact is negligible.

#### 4.2.2 Secondary Surveillance Radar (classical, monopulse and Mode S)

Zone	Zone 1	Zone 2	Zone 4
Description	0 - 500 m	500 m - 16 km but within maximum instrumented range <b>and</b> in radar line of sight	Further than 16 km <b>or</b> not in radar line of sight
Assessment Requirements	Safeguarding	Detailed assessment	No assessment

**Table 2: SSR recommended ranges**

Table 1 Taken from EUROCONTROL-GUID-0130

## 13.4 Aviation Lighting

13.4.1 The 2019 EIA Report described the regulatory requirement for aviation lighting. The 2020 Layout has a reduced number of turbines and the overall number of lights will therefore be reduced. The reduction of the height of a number of turbines from 200 to 180 m will not create any reduction in lighting as this captures the lighting requirement for all turbines in excess of 150 m. It is the case, however, that due to regulatory changes associated with Brexit and other issues, the strict requirement to illuminate every turbine may be relaxed where it is considered safe to do so. Taking the Viking Wind Farm as a precedent, it will be possible to consider local aviation operations, particularly the nature and volume of low level aviation operating under the Visual Flight Rules (VFR) at night when designing the layout of lighting. It will be essential to consult with all local operators, to accurately assess the requirement, then design a lighting layout that reflects the requirement. This layout will then be subject to approval from the CAA.

13.4.2 The CAA confirmed (A Wells CAA 03/02/20) that there is likely to be a change in the regulation and guidance concerning lighting of wind turbines in excess of 150 m, to align with international guidance which states: *For a group of two or more wind turbines, obstacle lighting must be fitted and operated when required to identify the corners and perimeter of the wind farm.* However, any change to UK regulation will be subject to public consultation which was planned to be undertaken between March and May 2020. The process was delayed but the lighting change proposal is contained within the draft change to CAA CAP 764 which was sent out to stakeholders for comment in May 2020. Once aviation stakeholder feedback has been completed, and the new guidance published in October 2020, it will be possible to undertake an aviation study of the local area to capture the requirements of local aviation stakeholders to determine the extent of lighting that would be sufficient to illuminate the Proposed Development whilst minimising visual impact. It is likely, therefore, that the overall lighting requirement as defined in the lighting report at Appendix 13.1 will be significantly reduced, but at this point it is not possible to say by precisely how much.

## 13.5 Comparison of Effects

13.5.1 In summary, the change from the 2019 Layout to the 2020 Layout makes little, if any difference to the aviation assessment conclusions in respect of significant effects. The reduction in turbine numbers will create a reduced technical impact on the MOD TPS-77 radar at RRH Saxa Vord, but will not materially alter the overall impact of the Proposed Development. In relation to civilian aviation operations, there is no difference between the 2019 Layout and 2020 Layout and the impact of the 2020 Layout remains negligible.

## 13.6 References

Eurocontrol (2014) Edition: 1.2: September 2014 ISBN number: 978-2-87497-043-6 Reference nr: EUROCONTROL-GUID-130. Available at:

<https://www.eurocontrol.int/sites/default/files/publication/files/20140909-impact-wind-turbines-sur-sensors-guid-v1.2.pdf>