

## 7.0 ELECTROMAGNETIC INTERFERENCE AND AVIATION

### INTRODUCTION

- 7.1 This chapter of the ES assesses the potential impacts of the proposed development on electromagnetic communications including television and radio reception, scanning telemetry, microwave links, air traffic control and radar.
- 7.2 Wind turbines can potentially interfere with communication systems that use electromagnetic waves as the transmission medium (e.g. television, radio or microwave links). The significance of the effect is largely dependent upon the design and location of the wind turbine and whether or not the turbine's blades are rotating. Any tall structure can result in the potential disruption of electromagnetic signals, either where the development creates a 'shadow' or where it gives rise to a 'reflection'.

### POLICY CONTEXT

#### National Planning Policy Framework

- 7.3 Footnote 17 of the NPPF (referring to paragraph 97, third bullet above) states that:

*"In assessing the likely impacts of potential wind energy development when identifying suitable areas, and in determining planning applications for such development, planning authorities should follow the approach set out in the National Planning Policy Statement for Renewable Energy (read with the relevant sections of the Overarching National Policy Statement for Energy, including that on aviation impacts)."*

#### National Policy Statement

- 7.4 As referred to in the NPPF, relevant national policy regarding aviation is set out in Part 5.4 of the Department of Energy and Climate Change's (DECC) 'Civil and Military Aviation and Defence Interests' of the Overarching National Policy Statement (NPS) for Energy (EN-1)<sup>1</sup>.
- 7.5 Paragraph 1.23 of DECC's NPS for Renewable Energy Infrastructure (EN-3) explains the relevance of the NPS as a material consideration for planning applications for renewable energy infrastructure projects, as follows:

*"...This NPS may be helpful to local planning authorities (LPAs) in preparing their local impact reports. In England and Wales this NPS is likely to be a material consideration in decision making on relevant applications that fall under the Town and Country Planning Act 1990 (as amended). Whether, and to what extent, this NPS is a material consideration will be judged on a case by case basis..."*

---

<sup>1</sup> Department of Energy and Climate Change (DECC) webpage on National Policy Statement on Energy Infrastructure. Available online @ <https://www.gov.uk/consents-and-planning-applications-for-national-energy-infrastructure-projects#national-policy-statements-for-energy-infrastructure>

- 7.6 Policy guidance set out in EN-1 and EN-3 (especially EN-1 Part 5.4 ‘Civil and Military Aviation Interests’ and EN-3 Part 2, Section 2.7 ‘Onshore Wind’) has been followed as part of this assessment.

### **Department of Energy and Climate Change – Memorandum of Understanding**

- 7.7 The development of onshore wind turbines can be slowed due to objections on aviation and safety grounds raised by the military (Ministry of Defence [MoD] and the Royal Air Force [RAF]) or civilian bodies (National Air Traffic Service [NATS], the Civil Aviation Authority [CAA] and airport operators). In order to facilitate cooperation between these operators, a Memorandum of Understanding (MoU) regarding ‘Wind Turbines and Aviation Radar (Mitigation Issues)’ between DECC, MoD, NATS, CAA and the Department for Transport (DfT) was signed in 2008. With a change of emphasis towards “...deployment of successful solutions...”, a second MoU has been developed and signed in 2011 by the original signatories plus the Crown Estate, Airport Operators Association (AOA) and the Scottish Government.

### **Civil Aviation Authority (CAA) – Wind Energy Policy and Guidelines**

- 7.8 Due to an excessively high demand, the CAA no longer responds to pre-planning applications for wind turbines. Instead, developers are directed to the CAA’s Policy and Guidelines on Wind Turbines (CAP 764, January 2012)<sup>2</sup>. The policy and guidelines in CAP 764 have been considered as part of this assessment.

### **NATS and NERL – Wind Farm Services**

- 7.9 NATS (formerly the National Air Traffic Service within the CAA) provides wind energy developers with online support<sup>3</sup>.
- 7.10 The NATS (En Route) Plc (‘NERL’) is responsible for the movement of en-route aircraft flying in controlled airspace in the UK. NERL operates a comprehensive infrastructure of radars, communication systems and navigational aids throughout the UK. The following consultation zones regarding tall structures (including wind turbines) are applicable to each of the NERL operated facilities below:
- 54 air-ground-air (AGA) communication stations - (10 km consultation zone);
  - 55 navigation aids (NAV) - (10 km consultation zone);
  - 19 primary surveillance radar (PSR) stations (15 nautical miles in line with CAP 764); and
  - 20 secondary surveillance radar (SSR) stations (15 nautical miles in line with CAP 764).

<sup>2</sup> Civil Aviation Authority (CAA) ‘Policy and Guidance on Wind Turbines (CAP 764) available online at: <http://www.caa.co.uk/application.aspx?catid=33&pagetype=65&appid=11&mode=detail&id=2358>

<sup>3</sup> NATS ‘Wind Farm Services’ available online at: <http://www.nats.aero/services/information/wind-farms/>

- 7.11 Appendix 2 of CAP 764, details a method to assist developers to determine whether or not a more detailed assessment needs to be carried out in relation to primary surveillance radars (PSR) based on the radar's line-of-sight. To assist developers with this assessment, NATS provide a series of ten online 'self-assessment maps' which correspond to wind turbines with tip heights from 20 m to 200 m describing the areas (shown as blue circles on the maps) where the turbine of the relevant height would be within the line-of-sight of one of the nineteen PSRs operated by NERL. The NATS/NERL Self-Assessment Maps have been utilised within this assessment, as described in more detail below.

## ASSESSMENT METHODOLOGY

- 7.12 A pre-planning consultation exercise has been undertaken as part of this assessment. Accordingly, relevant telecommunications and aviation organisations have been consulted with regard to existing infrastructure within and around the site as set out below:
- Ofcom (Spectrum.Licensing@ofcom.org.uk), consultation response received 15<sup>th</sup> April 2014;
  - Atkins (Windfarms@atkinsglobal.com), consultation response received 16<sup>th</sup> April 2014;
  - Joint Radio Company (Windfarms@jrc.co.uk), consultation response received 15<sup>th</sup> April 2014; and
  - Ministry of Defence (DIO-Safeguarding-Wind@mod.uk), consulted in April 2014, no response to date.

## CONSTRUCTION IMPACTS, MITIGATION & RESIDUAL EFFECTS

- 7.13 Effects on electromagnetic communications and aviation are only likely to occur once the proposed development has been erected and is fully operational. Therefore, no adverse impacts on electromagnetic communications or aviation would arise during the construction phase and no mitigation is necessary.

## OPERATIONAL IMPACTS, MITIGATION & RESIDUAL EFFECTS

### Telecommunications

- 7.14 Ofcom manages fixed microwave links across the UK on behalf of individual telecommunication organisations. Upon consultation on the proposed development at Wreys Barton Farm, Ofcom did not identify any operators who required further direct consultation.

## Water, Electricity and Utilities Industry

- 7.15 Atkins and the Joint Radio Company (JRC) manages microwave links operated by the water, electricity or utilities industries. Upon consultation on the proposed development at Wreys Barton Farm, neither Atkins nor JRC identified any operators who required further direct consultation.

## Television Interference

- 7.16 Terrestrial television transmissions for domestic reception within the UK are the joint responsibility of the BBC and Ofcom. Distribution links and other communication links are provided and operated on behalf of the broadcasters by National Grid Wireless and Arqiva.
- 7.17 Digital television is much more robust to interference than the former analogue system. Digital UK led the implementation of digital TV switchover in the UK. It is understood from the Digital UK website that the local area currently receives 'good' reception for 81 channels, 'variable' reception for 43 channels and 'good' reception for 10 high-definition (HD) channels.
- 7.18 As digital TV greatly compresses sound and pictures in order to be transmitted on the digital signal, several television channels can be transmitted using the same bandwidth as just one analogue channel. This makes it a much more effective way to transmit television signals. Digital television transmission does not generally suffer from ghosting, which can be caused by minor reflections of the signal, but sudden picture degradation may occur only in extreme circumstances due to signal reflections. Therefore, as the properties in the Lewdown area have switched over to digital television, the likely effect of the proposed development on television interference is considered to be negligible.

## Aviation

- 7.19 DECC provide a series of 'Aviation Safeguarding Maps' available to download from their website<sup>4</sup>. The turbine's location has been reviewed against the location of the various aviation safeguarding zones and can be summarised as follows:
- Aerodrome & Airfields (CAA) – CLEAR;
  - Radar Maps (NERL and NATS):
    - Primary Surveillance Radar (PSR) (up to 80 m) – CLEAR;
    - Secondary Surveillance Radar (SSR) – CLEAR;
    - Air-Ground-Air (AGA) communications – CLEAR;
    - En-route Navigation Aids – CLEAR
  - Met Station Zones (MoD) – CLEAR
  - Air Traffic Control and Air Defence Radar (MoD) – CLEAR
  - Low Flying Zone (MoD) – BLUE (area with no military low flying concerns)

<sup>4</sup> <https://restats.decc.gov.uk/cms/aviation-safeguarding-maps/>

- 7.20 The MoD were consulted in April 2014 and no response had been received at the time of submission. However, based on a review of the safeguarding zone maps, the impact of constructing the wind turbine at its proposed location on MoD operations is considered to be negligible.
- 7.21 A review of the NATS self-assessment maps indicates that the proposed location of the turbine at Wreys Barton Farm would not require a detailed assessment to be undertaken by NATS to ascertain the impact of the proposed turbine on the PSR and AGA radar.

## SUMMARY

- 7.22 Wind turbines can potentially interfere with communication systems that use electromagnetic waves as the transmission medium (e.g. television, radio or microwave links). The Companion Guide to the former PPS22 describes the potential for wind turbines to affect electromagnetic transmissions in two ways, namely:
- the blocking or deflecting of the line of sight of transmissions (as with any large structure); or
  - the dispersing of signals.
- 7.23 Likewise, wind turbines can cause air traffic safety problems as they: (i) represent a potential collision risk for low-flying aircraft, especially if near a local aerodrome or military airfield and; (ii) can interfere with ground based air traffic control radar and aircraft landing instruments.
- 7.24 A pre-planning consultation exercise has been undertaken during this assessment (as set out above). The main consultation responses and mitigation measures, where necessary, are summarised in Table 7.1.

**Table 7.1: Summary Impact Table – EMI and Aviation**

DESCRIPTION OF POTENTIAL IMPACT	MITIGATION / ENHANCEMENT MEASURES	RESIDUAL EFFECT
Potential effect on microwave links operated by Utilities (Water Industry)	Detailed consultation with Atkins (re South West Water) resulted in <b>NO OBJECTION</b> to turbine location at SX 43810 87623.	None
Potential effect on microwave links operated by Utilities (Electricity Industry)	Detailed consultation with JRC (re Western Power Distribution inc. Surf Telecom Ltd and JRC) resulted in <b>NO OBJECTION</b> to turbine location at SX 43810 87623.	None
Television interference.	The transmitters which serve the Lewdown area have switched to digital, which is considerably more robust than the analogue system, as discussed above. Therefore, the likely effect on television interference is minimal.	Negligible

DESCRIPTION OF POTENTIAL IMPACT	MITIGATION / ENHANCEMENT MEASURES	RESIDUAL EFFECT
Aviation interference.	No objections have been raised by the CAA or MoD at the time of submitting the application. A detailed NATS radar assessment is not required based on a review of the published self assessment maps.	None

## CONCLUSION

- 7.25 From a detailed consultation study, it has been determined that the proposed development at Wreys Barton Farm (SX 43810 87623) would not cause any electromagnetic interference with any scanning telemetry or microwave links operated by telecommunication or utility companies.
- 7.26 This assessment has also determined that the reception of digital television reception at any property in the Lewdown area is very unlikely to be affected by the proposed development at SX 43810 87623.