

14 Aviation, Radar and Telecommunication

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14 Aviation, Radar and Telecommunication

14.1 Executive Summary

- 14.1.1 An initial scoping study relating to aviation, radar and telecommunications identified those stakeholders potentially affected by the Proposed Development. The 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, as well as operators of telecommunications links. The scoping process identified potential impacts to primary radars operated by NATS and Glasgow Airport.
- 14.1.2 Consultations were conducted with NATS, Glasgow Airport, Glasgow Prestwick Airport, Atkins, the Joint Radio Company (JRC) and Arqiva; additionally, the Ofcom online database of fixed links was interrogated to identify any links near the Proposed Development site (note that Ofcom no longer provides such information directly).
- 14.1.3 Identified potential impacts to the NATS and Glasgow Airport primary radars will be mitigated through the blanking of the affected radars and the provision of in-fill coverage from the unaffected Terma radar at Glasgow Airport. Legal agreements with these organisations will be put in place to secure the mitigation proposal, to allow their conditional approval of the Proposed Development.
- 14.1.4 Following implementation of the mitigation solution outlined above, it is concluded that there will be no significant residual effects on aviation or telecommunication infrastructure as a result of the operation of the Proposed Development.

14.2 Introduction

- 14.2.1 This chapter considers the potential effects of the Proposed Development on existing and planned military and civil aviation activities, television and telecommunications infrastructure.
- 14.2.2 Wind turbines are not directly subject to the Communications Act 2003 and require no authorisation from Ofcom in their management of the radio spectrum and granting of licenses under the Wireless Telegraphy Act. However, planning authorities do consider the potential impact of structures on existing infrastructure and they require that consideration of such impacts is made by wind energy developers.
- 14.2.3 Radio waves and microwaves are used in a variety of communications and any large structure has the potential to interfere with their reception. The magnitude of the impact on a structure is principally dependent upon the size, shape and materials of construction. Wind turbines are very slender and the rotor is substantially constructed from non-conducting materials (Glass Reinforced Plastic), both of which reduce their potential for causing interference. However, the tower is usually steel and the rotor blades contain some conductive materials, for lightning conduction and in some cases structural carbon fibre. The blade movement may also have an effect on radars, which are designed to detect movement.
- 14.2.4 The potential effects on electromagnetic signals 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 on communications infrastructure or radar. In the extreme, sites can be considered inappropriate for wind energy development.

- 14.2.5 The key considerations for the Proposed Development are the potential effects on civil aviation and defence radar, microwave and ultra-high frequency (UHF) band communications and television broadcasting. An Electromagnetic Interference Survey (EMI) was undertaken to determine the suitability of the site and any mitigation measures required to overcome any identified potential effects. The EMI assessment was conducted through a combination of consultation with the operators of these systems where possible, with independent impact assessment where this is not possible.

14.3 Legislation, Policy and Guidelines

- 14.3.1 The relevant sections of key legislation, policy and guidance documents are described below, which together place a responsibility on the planning authorities and the developer to assess potential impacts on aviation and telecommunications links in particular.

Legislation

- 14.3.2 Civil Aviation Authority (CAA) CAP 393, The Air Navigation Order and Regulations, specifies the statutory requirements for the lighting of onshore wind turbines over 150 m tall.

Policy

- 14.3.3 Chapter 5 of the EIA Report sets out the planning policy framework that is relevant to the EIA. The policies set out include those from the adopted Strategic Development Plan and Local Development Plan (LDP) that cover South Lanarkshire (2015), those relevant aspects of Scottish Planning Policy (SPP), National Planning Framework 3 (NPF3), Planning Advice Notes and other relevant guidance. Of relevance to the aviation, radar and telecommunications assessment presented within this chapter, regard has been given to the following policies.

Scottish Planning Policy (SPP), 2014

- 14.3.4 The SPP states under paragraph 169 on Development Management, that consideration should be given to the, *“impacts on aviation and defence interests and seismological recording; [and] impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised”*.
- 14.3.5 It also highlights that *Planning Advice Note 62, Radio Telecommunications* provides advice on siting and design, as does the *Planning Circular 2/2003: Safeguarding of Aerodromes, Technical Sites and Military Explosives*.

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

- 14.3.6 This Circular summarises the Scottish Ministers’ understanding of the general effect of the relevant primary or secondary legislation.
- 14.3.7 It contains 4 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 (as at 27 January 2003).
- 14.3.8 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.

Planning Advice Note (PAN) 62: Radio Telecommunications

- 14.3.9 PAN 62 states that, *“Large and prominent structures such as tall buildings and wind farms can cause disruption to radio telecommunications services by obstructing or reflecting the signals. The Radiocommunications Agency (Now Ofcom) may be able to suggest engineering solutions to overcome the problem, such as installing repeaters. Planning authorities can grant planning permission for such prominent structures subject to a condition that before development commences the developer will propose measures by which the quality of reception affected by the proposal will be maintained.”*

CAA Policy Statement: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level

- 14.3.10 This policy statement highlights and clarifies the requirements set out in CAP393, the Air Navigation Order, for the lighting of onshore turbines. Key sections are described further under the assessment methodology below.

South Lanarkshire Local Development Plan (2015)

- 14.3.11 Policy 19 (Renewable Energy) of the LDP is relevant to the aviation, radar and telecommunication assessment.

SLC Supplementary Guidance 10 on Renewable Energy (2015)

- 14.3.12 SLC Supplementary Guidance 10 on Renewable Energy (2015) sets out policies and other advice in support of wind developments in South Lanarkshire. Paragraph 6.95 to 6.102 (Development Management Considerations) deals with aviation matters and states that *“the impacts of the proposal on radar performance, defence interests and other air safety and seismological recording considerations must be satisfactorily addressed and demonstrated to the satisfaction of the relevant technical authorities”* (paragraph 6.101).
- 14.3.13 Paragraphs 6.105 to 6.108 deal with matters relating to telecommunication and broadcasting installations and states, *“the siting of wind turbines must have regard to radio, television, telecoms and other communication systems particularly ensuring that transmission links are not compromised”* (paragraph 6.105).
- 14.3.14 Parts 15 and 16 of the assessment checklist (Table7.1) address aviation and telecommunication impacts and the requirement for them to be assessed within the EIA Report.

Guidance

- 14.3.15 CAA guidance, within CAP 764 (CAA Policy and Guidance on Wind Turbines), sets out recommended consultation and assessment criteria for the impacts of wind turbines on all aspects of civil aviation.
- 14.3.16 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.”*
- 14.3.17 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.
- 14.3.18 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”*.

14.3.19 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.”*

14.4 Consultation

14.4.1 The aviation stakeholders consulted as a part of the EIA Scoping process were NATS, Glasgow Airport, Glasgow Prestwick Airport (GPA) and the Ministry of Defence (MoD).

14.4.2 Relevant telecommunications and television broadcasting stakeholders were also consulted, as set out in Table 14.1 below. Table 14.1 provides a summary of all consultation responses received. Copies of relevant consultee communications are provided in Appendices 4.2 and 4.3.

Table 14.1 – Consultee Responses

Consultee	Response	Actions
NATS	<p>NATS En-route Plc (NATS), was initially consulted on 24 May 2018.</p> <p>NATS is expected to object to the development without mitigation.</p> <p>Discussions determined that mitigation was likely to be possible through the same means as is currently provided for the other wind energy developments in this area (Nutberry, Galawhistle, Dalquhandy and Douglas West).</p> <p>It is anticipated that NATS will be in a position to withdraw its objection, subject to a suitably worded planning condition.</p>	<p>The assessment of, and contracting for, mitigation with NATS is ongoing. A solution has been identified and is the subject of ongoing feasibility checks to confirm its acceptability to NATS.</p> <p>Subsequent to the formal approval of the technical solution, the Applicant will enter into a contract for mitigation. This will enable NATS to remove its objection fully, conditional upon the mitigation being implemented prior to turbine installation.</p> <p>Draft condition wording will be agreed with NATS and submitted to the Scottish Ministers.</p>
Glasgow Airport	<p>Glasgow Airport was initially consulted on 24 May 2018.</p> <p>Glasgow Airport is also expected to object to the development without mitigation.</p> <p>The airport installed a turbine mitigating radar in June 2018 and this is expected to provide mitigation for this project.</p>	<p>The situation with Glasgow Airport is similar to that with NATS. NATS provides assessment and contracting services for the airport and is providing these elements for the airport in parallel with the NATS mitigation. The solution is essentially common in using the Glasgow Terma radar to in-fill the conventional radar. Hence, the solution has been identified and is the subject of ongoing feasibility checks to confirm its acceptability.</p> <p>Subsequent to the formal approval of the technical solution, the Applicant will enter into a contract for mitigation. This will enable Glasgow Airport to remove its objection, conditional upon the mitigation being implemented prior to turbine installation.</p> <p>Draft condition wording will be agreed with the airport and submitted to the Scottish Ministers for approval.</p>

Consultee	Response	Actions
Glasgow Prestwick Airport	Glasgow Prestwick Airport (GPA) was consulted on 31 January 2019. GPA have previously considered that any turbines that impact its radar in this area, may be of concern. A full radar line of sight analysis was conducted, which concluded that there would be no radar impact. This information was submitted to GPA within the consultation.	A response to the consultation with the airport is awaited at the time of writing.
MoD	The MOD responded to the Scoping Report on 17 December 2018, with no objections, MOD reference DIO 10044779.	No further action is required.
Ofcom (via Spectrum Licensing) (licensee for all fixed links)	Ofcom no longer provides details of fixed links however this information is available from Ofcom's online database. This was interrogated and no fixed links were identified within 1 km of any proposed turbines.	No further action is required.
Joint Radio Company (JRC) (safeguarding communications for the electricity and gas utilities)	JRC provided a response on 07 February 2019 clearing the Proposed Development with respect to radio link infrastructure operated by Scottish Power and Scotia Gas Networks.	No further action is required.
Atkins (safeguarding communications for the water utilities)	Atkins provided a response on 08 February 2019 stating they had no objection to the Proposed Development in relation to UHF Radio Scanning Telemetry communications.	No further action is required.
Arqiva (Operator of the television broadcasting infrastructure)	Arqiva provided a response on 06 February 2019 confirming no concerns with respect to fixed links. Arqiva does not provide assessment of impacts on digital television reception.	No further action is required.
Openreach (on behalf of BT radio network)	Openreach responded to the Scoping Report on 06 December 2018 with no objections and the conclusion that the Proposed Development should not cause interference to BT's current and presently planned radio network.	No further action is required.

14.5 Assessment Methodology

Aviation and radar

14.5.1 The requirement for the Proposed Development to have no significant effects on aviation is established 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 enable 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) until formal consent applications have been submitted. The stakeholders consider dialogue a higher priority and more meaningful, once design iterations are completed and a live application exists.

- 14.5.2 An initial scoping study identified those stakeholders potentially affected by the Proposed Development. 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. The scoping process identified NATS, Glasgow Airport, Glasgow Prestwick Airport and the MoD as relevant stakeholders.
- 14.5.3 The principal sensitivity is the visibility of the turbines to those radars potentially affected. Because of this, studies have been conducted prior to submission to assess the visibility of the Proposed Development to all relevant radars in the area. These studies determined that at least some of the turbines are expected to be visible to the NATS primary surveillance radars at Lowther Hill and Cumbernauld and to the Glasgow Airport primary surveillance radar. Impacts on secondary surveillance radar are not expected to be significant at this range and location. No impacts on any other radar are expected, including that operated by Glasgow Prestwick Airport.
- 14.5.4 A detailed assessment of the impacts on the Glasgow Prestwick radar was conducted and determined that there would be no impacts. Dialogue with NATS and Glasgow Airport is ongoing, with mitigation identified and approval anticipated in due course in both cases.
- 14.5.5 The site is sufficiently remote from all aerodromes to not be considered as a physical obstruction.
- 14.5.6 As structures over 150 m high there is a statutory requirement for aviation lighting on the Proposed Development turbines. The precise details of the lighting will need to be agreed with the CAA prior to construction. The requirements for the lighting of en-route obstacles (i.e. those away from the vicinity of a licensed aerodrome) are set out in Article 222 of the UK Air Navigation Order (ANO) 2016.2. This article requires medium intensity (2000 candela) steady red aviation warning lights to be mounted as close as possible to the top of all structures at or above 150 m above ground level (AGL). In terms of the requirement for lighting wind turbine generators, the CAA interprets this as the fitting of lights on the top of the supporting structure (the nacelle) rather than the blade tips. Additionally, at least three (to provide 360-degree coverage) low-intensity lights (32 candela) should be provided at an intermediate level of half the nacelle height. The lights should be turned on only when illuminance reaching a vertical surface falls below 500 LUX (dusk like conditions). If the horizontal meteorological visibility in all directions from every wind turbine generator in the Proposed Development is more than 5 km, the intensity of the nacelle mounted lights may be reduced to not less than 10% of the minimum peak intensity specified for a light of this type. If four or more wind turbine generators are located together in the same group, with the permission of the CAA, only those on the periphery of the group need be fitted with a light.

Telecommunications

- 14.5.7 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 the behalf of the mobile service providers, the utility companies, the emergency services and occasionally by small private networks.

- 14.5.8 The impact assessment has been conducted through consultation with the operators of these systems. Ofcom (via Spectrum Licensing) manages the allocation of frequencies and holds a database of licensed links. The database is available online for interrogation to identify fixed links for any given area. Ofcom does not comment on impacts or consider mitigation, which must be conducted in direct discussions with the system operators if links are identified.

Television

- 14.5.9 Terrestrial television services within the United Kingdom are the joint responsibility of the BBC and Ofcom. The transmission network is provided and operated on behalf of the broadcaster Arqiva. With television broadcasting now having completed the conversion to a digital only service, only potential effects on the digital system need be considered.
- 14.5.10 Written consultation is required with the network operator Arqiva to address potential impacts on the television infrastructure. Consultation with Arqiva covers all the elements of the television broadcast infrastructure, with the exception of domestic television reception. Arqiva has confirmed that the development will not affect any of its microwave links. Arqiva does not provide assessment of potential impacts on digital television reception (refer to Table 14.1 above).
- 14.5.11 Potential effects on domestic television reception are assessed by consideration of the geography and topology of the local conurbations, the transmitter network, the off-air signal strength and the terrain.
- 14.5.12 The potential for negative effects on domestic television reception are greatly diminished post digital switchover. Currently there is no widely accepted method of determining the potential effects of wind turbines on digital reception. However, it is documented that digital television signals are much better at coping with signal reflections and digital television pictures do not suffer from ghosting. Digital transmitter powers increased to around ten times previous levels at digital switchover. At the same time digital signals were added to the relay transmitter network. These improvements greatly increased the availability and robustness of digital terrestrial reception. Since digital switch over, there are very few known cases of wind turbine interference with domestic television reception.

14.6 Baseline Conditions

Aviation

- 14.6.1 No aerodromes have the potential to be affected by the Proposed Development. No military radars have the potential to be affected by the Proposed Development. No weather radars, Navigational Aids or Air-Ground-Air communication stations have the potential to be affected by the Proposed Development.
- 14.6.2 Impacts on the NATS Lowther Hill and Cumbernauld primary radars are anticipated, which if unmitigated are unacceptable to NATS.
- 14.6.3 Impacts on the Glasgow Airport primary radar are anticipated, which if unmitigated are unacceptable to the airport.
- 14.6.4 No impacts on GPA are anticipated.
- 14.6.5 The MoD has confirmed that it has no objection to the Proposed Development. The MoD may request aviation lighting, but as this is a statutory requirement in any event, and this requirement will be met.

Telecommunications

- 14.6.6 The baseline was established by review of the online Ofcom database of fixed links, and consultation with JRC on behalf of the electricity and gas utilities, and Atkins on behalf of the water utilities. The

consultation responses are detailed in section 4 above. The consultation process determined that no infrastructure was sufficiently close to the Proposed Development to be affected.

Television

- 14.6.7 The baseline for potential Impacts on television interests comprises two elements, broadcast infrastructure and domestic reception.
- 14.6.8 Post digital switch-over impacts on domestic television reception are rare. Arqiva does not assess these impacts and the BBC does not provide a tool for the assessment of impacts to digital television reception. The impacts were therefore considered independently.
- 14.6.9 There are few properties in the immediate area of the Proposed Development. The nearest settlements of Douglas and Coalburn are primarily serviced from the main transmitter at Black Hill to the north, and a local transmitter at Glespin. The coverage from the Black Hill transmitter to these areas is strong indicating a high resilience to interference.
- 14.6.10 Overall it was determined that the baseline conditions were of few receptors (properties) with the potential to be affected, mitigated by a high digital signal strength and the inherently resilient nature of digital television reception.

14.7 Potential Effects

Construction

- 14.7.1 No EMI effects are anticipated to occur during construction of the Proposed Development. Given that any occurrence of EMI effects during the short commissioning period would replicate itself during operation of the Proposed Development, it is considered appropriate to consider the commissioning activities as part of the operational stage of the development.

Operation

Aviation

- 14.7.2 There is potential for major adverse (significant) effects on aviation interests during the operational phase of the Proposed Development, in the absence of mitigation.
- 14.7.3 The Applicant accepts the need to mitigate the impacts on the NATS radars at Lowther Hill and Cumbernauld and any associated consent conditions (where appropriate).
- 14.7.4 Similarly, the Applicant accepts the need to mitigate the impacts on the Glasgow Airport radar and any associated consent conditions (where appropriate).

Telecommunications

- 14.7.5 Based on a review of the online Ofcom database and direct consultations, no links were identified within 1 km of proposed turbines and no objection responses were received from Atkins and JRC.
- 14.7.6 It is therefore considered that the Proposed Development will have **no impact** on local telecommunication infrastructure.

Television

- 14.7.7 The nearest conurbations of Douglas and Coalburn are primarily serviced from the main transmitter at Black Hill to the north, and a local transmitter at Glespin. The location of the turbines is such that the strength of reflected signals can be expected to be weak. The coverage from the Black Hill transmitter to these areas is strong indicating a high resilience to interference. The turbines are therefore highly unlikely to have any impacts on domestic television reception.

- 14.7.8 Given the strength of the digital signal in the key conurbations and the inherently resilient nature of digital television reception, there is a very low risk of any interference from the Proposed Development to domestic television reception. The potential effects on television reception is therefore considered unlikely and not significant.

Decommissioning

- 14.7.9 No effects are anticipated to occur during the decommissioning and restoration phase of the Proposed Development.

14.8 Mitigation

- 14.8.1 The impacts on the NATS primary radars will be mitigated through the blanking of the affected radars and the provision of in-fill coverage from the unaffected Terma radar at Glasgow Airport (subject to the agreement of contractual arrangements).
- 14.8.2 The impacts on the Glasgow main primary radar will be mitigated through the blanking of the radar and the provision of in-fill coverage from the unaffected Terma radar at Glasgow Airport (subject to the agreement of contractual arrangements).
- 14.8.3 The Proposed Development will have aviation lighting to mark it as an en-route obstacle to low flying aircraft. The lighting requirements will be agreed with the CAA, with the lights meeting the requirements set out in Article 222 of the UK Air Navigation Order (ANO). It is anticipated that approximately five turbines will be lit (refer to Appendix 6.5), marking the development periphery and the highest point.
- 14.8.4 It should be noted that the proposed lighting plan is indicative and subject to further discussion and agreement with the CAA once consent is established. At the relevant time, in the light of all consented projects in this area, the developer and the CAA may wish to adopt a holistic approach with regards to aviation lighting across this and other nearby wind farm projects.

14.9 Residual Effects

- 14.9.1 There will be no residual effects during the construction or decommissioning phases of the Proposed Development with respect to aviation, radar and telecommunications.
- 14.9.2 Following implementation of appropriate mitigation with respect to NATS and Glasgow Airport radar concerns, there will be no residual effects on aviation, radar and telecommunication infrastructure during the operation of the Proposed Development.

14.10 Cumulative Assessment

- 14.10.1 It is considered that as none of the consented wind farm developments have significant residual effects on aviation, radar or telecommunication interests, the potential for cumulative effects is **negligible**.
- 14.10.2 Therefore, it is considered that there will be **no significant cumulative effects** on aviation, radar or telecommunication interests as a result of the Proposed Development.

14.11 Summary

- 14.11.1 This chapter has considered the potential effects of the Proposed Development on existing and planned military and civil aviation activities, television and telecommunications infrastructure.

- 14.11.2 Consultations have been conducted with Ofcom (via review of its online database), the licensee of the mobile phone and emergency services networks, the utilities which operate wireless data networks at microwave and UHF frequencies, Arqiva which operates microwave fixed links and off-air rebroadcast links, MOD, NATS, Glasgow Airport and Glasgow Prestwick Airport.
- 14.11.3 Impacts were identified on NATS and Glasgow Airport primary radars. Mitigation schemes have been identified to fully meet the requirements of these stakeholders, with no residual effects. Contracts will be entered into such that NATS and Glasgow Airport can provide their approval, conditional upon the implementation of the mitigation schemes prior to turbine erection.
- 14.11.4 No effects were identified on telecommunications or television broadcasting infrastructure.

Table 14.2 – Summary Table

Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial/ Adverse
Effects on aviation, radar and telecommunication interests during construction and decommissioning	Negligible	Neutral	Aviation lighting will be installed as soon as practicable on erected turbines.	Negligible	Neutral
Effects on telecommunications and TV reception during the operational period	Negligible	Neutral	None required	Negligible	Neutral
Effects on MoD low flying interests during the operational period	Negligible	Neutral	Aviation lighting will be installed.	Negligible	Neutral
Effects on NATS infrastructure during the operational period	Major	Adverse	Mitigation measure will be agreed between the Applicant and NATS	Negligible	Neutral
Effects on Glasgow Airport infrastructure during the operational period	Major	Adverse	Mitigation measure will be agreed between the Applicant and Glasgow Airport	Negligible	Neutral

14.12 References

- Civil Aviation Authority (Feb 2016). CAP 764: CAA Policy and Guidelines on Wind Turbines.
- 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
- Civil Aviation Authority (Mar 2018). CAP 393: The Air Navigation Order 2016 (ANO) and Regulations
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<https://www.ofcom.org.uk/spectrum/information/spectrum-information-system-sis/spectrum-information-portal>
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