



Sporad na Mara Offshore Wind Farm

Offshore Project

Environmental Impact Assessment Report

Chapter 17: Military and Civil Aviation, Volume 2a

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17 MILITARY AND CIVIL AVIATION

17.1 INTRODUCTION

17.1.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) presents the results of the assessment of the likely significant effects of the proposed Spiorad na Mara Offshore Windfarm (hereafter referred to as 'the Offshore Project') with respect to Military and Civil Aviation.

17.1.1.2 This chapter should be read in conjunction with the project description provided in **Chapter 3: Project Description, Volume 1a** and the relevant parts of the following chapters and appendices:

- **Chapter 16: Shipping and Navigation, Volume 2a:** due to marine activities associated with Search and Rescue operations;
- **Chapter 18: Seascape, Landscape and Visual Impact Assessment, Volume 2a:** due to the effect of aviation lighting.

17.1.1.3 This chapter describes the following:

- Legislation, planning policy and other documentation that has informed the assessment (Section 17.2: Summary of policy and legislative context);
- Outcome of consultation and engagement that has been undertaken to date, including how matters relating to Military and Civil Aviation have been addressed (Section 17.3: Scoping and Consultation);
- Scope of the assessment for Military and Civil Aviation (Section 17.4: Scope of the assessment);
- The methods of assessment used for baseline data gathering and impact assessment (Section 17.5: Methodology for baseline data gathering and impact assessment);
- Overall baseline (Section 17.6: Baseline conditions);
- Embedded environmental measures relevant to Military and Civil Aviation and the relevant maximum design scenario (Section 17.7: Basis for Environmental Impact Assessment);
- Assessment of Military and Civil Aviation likely significant effects and further mitigation (Section 17.8 - 17.10: Assessment of effects);
- Assessment of Military and Civil Aviation Combined effects (Section 17.11);
- Assessment of Military and Civil Aviation Whole Project effects (Section 17.12);
- Assessment of Military and Civil Aviation Cumulative effects (Section 17.13);
- Assessment of Transboundary effects (Section 17.14)
- A summary of residual effects for Military and Civil Aviation (Section 17.15: Summary of residual effects);
- Glossary and abbreviations used in the Military and Civil Aviation assessment (Section 17.16 Glossary of terms and abbreviations);
- Information sources and documentation referred to in this chapter (Section 17.17).

17.1.1.4 The chapter is supported by the following appendices and figures:

- **Appendix 17.1: Airspace Analysis and Radar Modelling, Volume 2c;**
- **Appendix 17.2: Instrumental Flight Procedures, Volume 2c;**
- **Figure 17-1: Military and Civil Aviation Study Area, Volume 2b;**
- **Figure 17-2: Day-time Low Flying Areas and Night-Time Low Flying Areas, Volume 2b;**
- **Figure 17-3: FIR Boundaries, Volume 2b;**
- **Figure 17-4: Military and Civil Aviation Cumulative Zone of Influence, Volume 2b.**

17.2 SUMMARY OF POLICY AND LEGISLATIVE CONTEXT

17.2.1.1 This section outlines the legislation, policy and guidance that is relevant to the assessment of likely significant effects on Military and Civil Aviation associated with the construction, operation, maintenance and decommissioning of the Offshore Project. In addition, other national, regional, and local policies are considered within this assessment where they are judged to be relevant. Further information on policies relevant to the EIAR is provided in **Chapter 2: Policy and Legislative Context, Volume 1a**.

17.2.1.2 A summary of the legislation and policy relevant to Military and Civil Aviation is provided in **Table 17-1** which examined their relevance to the assessment.

Table 17-1: Legislation, policy in relation to Military and Civil Aviation

Title	Relevance to Military and Civil Aviation
National Legislation / Policy	
Air Navigation Order (ANO) 2016 No. 765 (Civil Aviation Authority (CAA), 2022).	<p>The ANO implements the UK's obligations under the Chicago Convention on International Civil Aviation and regulates aspects of aviation safety.</p> <p>Article 222 details the requirements for the lighting of en route obstacles that are 150 m or more Above Ground Level (AGL). Article 223 modifies the requirements of Article 222 with respect to Wind Turbine Generators (WTGs) in UK territorial waters of 60 m or more above the level of the sea at the highest astronomical tide (HAT). Article 225A details the requirements for notifying the CAA of any planned works to erect new obstacles that are 100 m or above sea level.</p>
National Planning Framework 4 (Scottish Government, 2023).	The Energy policy (policy 11) states that project design and mitigation will demonstrate how impacts on aviation and defence interests are addressed.
Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2020).	Aims to identify sustainable plan options for future development of commercial scale offshore wind energy in Scotland/ <i>Alba</i> , including deep water wind technologies, and covers both Scottish inshore and offshore waters.-scale offshore wind energy in Scotland

Title	Relevance to Military and Civil Aviation
	Highlights that offshore wind farm developments may have a negative effect on aviation, defence and communication facilities.
Scotland's National Marine Plan (Scottish Government, 2015).	<p>Chapter 15: Defence state that to maintain operational effectiveness of Scottish waters used by the armed services, development and use will be managed in these areas:</p> <ul style="list-style-type: none"> • Naval areas including bases and ports: Safety of navigation and access to naval bases and ports will be maintained. The extent to which a development or use interferes with access or safety of navigation, and whether reasonable alternatives can be identified, will be taken into account by consenting bodies. Proposals for development and use should be discussed with the Ministry of Defence (MOD) at an early stage in the process; • Firing Danger Areas: Development of new permanent infrastructure is unlikely to be compatible with the use of Firing Danger Areas by the MOD. Permitted activities may have temporal restrictions imposed. Proposals for development and use should be discussed with the MOD at an early stage in the process; • Exercise Areas: Within Exercise Areas, activities may be subject to temporal restrictions. Development and use that either individually or cumulatively obstructs or otherwise prevents the defence activities supported by an exercise area may not be permitted. Proposals for development and use should be discussed with the MOD at an early stage in the process; • Communications, Navigation and Surveillance including radar: Development and use which causes unacceptable interference with radar and other systems necessary for national defence may be prohibited if mitigation cannot be determined. Proposals for development and use should be discussed with the MOD at an early stage in the process. <p>For the purposes of national defence, the MOD may establish by-laws for exclusions and closures of sea areas. In most areas, this will mean temporary exclusive use of areas by the MOD. Where potential for conflict with other users is identified, appropriate mitigation will be identified and agreed with the MOD, prior to planning permission, a marine licence, or other consent being granted.</p>
Civil Aviation Publication (CAP) 168: Licensing of Aerodromes (CAA, 2022).	CAP 168 sets out the standards required at UK licensed aerodromes relating to management systems, operational procedures, physical characteristics, assessment and treatment of obstacles and visual aids.

Title	Relevance to Military and Civil Aviation
CAP 437: Standards for Offshore Helicopter Landing Areas (CAA, 2023).	CAP 437 provides the criteria applied by the CAA in assessing offshore helicopter landing areas for worldwide use by helicopters registered in the UK and includes winching area 'best practice' design criteria for wind turbine platforms.
CAP 670: Air Traffic Services Safety Requirements (CAA, 2019).	CAP 670 sets out the safety regulatory framework and highlights the requirements to be met by providers of civil Air Traffic Services (ATS) and other services in the UK in order to ensure that those services are safe for use by aircraft.
CAP 764: Policy and Guidelines on Wind Turbines (CAA, 2025).	CAP 764 details the CAA policy and guidelines associated with WTG impacts on aviation that stakeholders and wind energy developers need to consider when assessing a development's viability.
CAP 1616: The Process for Changing the Notified Airspace Design (CAA, 2023).	CAP 1616 explains the airspace change process for making permanent changes to the notified airspace design. Supporting documents (CAP 1616F, G, H, and I) provide guidance on how the requirements of the airspace change process may be met.
CAP 1616F: Guidance on Airspace Change Process for Permanent Change Proposals (CAA, 2023).	CAP 1616F provides guidance to the aviation industry on the airspace change process requirements for permanent Airspace Change Proposals (ACPs).
CAP 1616G: Guidance on Airspace Change Process for Temporary and Trial Airspace Change Proposals (CAA, 2024).	CAP 1616G provides guidance to the aviation industry on the airspace change process requirements for temporary and trial ACPs.
CAP 1616H: Guidance on Airspace Change Process for Level 3 and Pre-Scaled Airspace Change Proposals (CAA, 2023).	CAP 1616H provides guidance to the aviation industry on the airspace change process requirements for permanent Level 3 and pre-scaled ACPs.
CAP 1616I: Environmental Assessment Requirements and Guidance for Airspace Change Proposals (CAA, 2023).	CAP 1616I provides guidance to the aviation industry on providing environmental and habitats regulations assessments for ACPs.
Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 654 Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response (MCA, 2021).	MGN 654 highlights issues to consider when assessing navigational safety and emergency response, caused by OREI developments.
MCA Document Offshore Renewable Energy Installations: Requirements, Guidance and	The document provides a description of MCA policy, and guidance, advice and specific requirements to assist and enable Search and

Title	Relevance to Military and Civil Aviation
Operational Considerations for search and rescue (SAR) and Emergency Response (MGN 654 Annex 5) (MCA, 2024).	Rescue (SAR) operations to, within and in the vicinity of Offshore Wind Farms (OWFs).
MOD Obstruction Lighting Guidance (MOD, 2020).	The guidance includes details of MOD requirements for the lighting of offshore developments.
Technical Guidance	
CAP 032: UK Aeronautical Information Publication (AIP) (CAA, 2025).	The UK AIP is the main resource for information on facilities, services and flight procedures at all licensed UK airports, as well as UK airspace rules, regulations and restrictions, en route procedures, charts and other air navigation information.
UK Military AIP (MOD, 2025).	The UK military AIP is the main resource for information and flight procedures at all military aerodromes. This AIP also contains information regarding military airspace and Practice and Exercise Areas (PEXAs).

17.3 SCOPING AND CONSULTATION

17.3.1 OVERVIEW

- 17.3.1.1 This section describes the stakeholder engagement undertaken for the Offshore Project. This consists of early engagement, the outcome of, and response to, the Scoping Opinion in relation to the Military and Civil Aviation assessment, informal consultation and consultation undertaken through the Preliminary Application Consultation (PAC) process (hereafter referred to as the ‘formal consultation’). An overview of engagement undertaken for the Offshore Project as a whole can be found in **Chapter 5: Approach to EIA, Volume 1a** and **Appendix 5.4: Stakeholder Consultation and Engagement, Volume 1c**.
- 17.3.1.2 Consultation is a key feature of the EIA process and continues throughout the lifecycle of the Offshore Project, from the initial stages through to consent and post consent.
- 17.3.1.3 Consultation captures all consultation and engagement and has been ongoing with a number of prescribed and non-prescribed consultation bodies and local authorities in relation to Military and Civil Aviation. All consultation to date has been undertaken in line with the process described in **Chapter 5, Volume 1a** and **Appendix 5.4, Volume 1c**. Feedback received during this process has been incorporated into the EIAR wherever possible as appropriate.

Scoping Opinion

- 17.3.1.4 Spiorad na Mara Limited (hereafter referred to as ‘the Applicant’) submitted a Scoping Report (Spiorad na Mara limited, 2023) and request for a Scoping Opinion to the MD-LOT in September

2023. A Scoping Opinion was received in May 2024. The Scoping Report sets out the proposed Military and Civil Aviation assessment methodologies, an outline of the baseline data collected to date and proposed, and the scope of the assessment. The comments received in the Scoping Opinion and how these have been addressed in this EIAR is provided in **Appendix 5.2: Response to Scoping Opinion, Volume 1c**.

17.3.1.5 A summary of those responses relevant to Military and Civil Aviation is shown in **Table 17-2**. Regard has also been given to other stakeholder comments that were received in relation to the Scoping Report.

Table 17-2: Scoping Opinion responses – Military and Civil Aviation

Consultee	Date / Document	Comment	Response/where this is addressed in the EIAR
MD-LOT	Scoping Opinion May 2024	5.2.11.2 <i>“The Scoping Report details proposed impacts to be scoped into or out of the EIA Report in table 6.11-2. The Scottish Ministers, in line with the NATS representation, advise that aviation is scoped in for further assessment within the EIA Report and advise the Developer engages with NATS in the design process of the Proposed Development to minimise any impacts to aviation radio communications.</i>	The impact to NATS Air-Ground-Air (AGA) radio stations have been assessed within Appendix 17.1, Volume 2c and Section 17.9. Engagement with NATS will continue to ensure that the potential impact to their radio communications is reduced to an acceptable level or removed entirely.
MD-LOT and MOD	Scoping Opinion May 2024	5.2.11.2 <i>“Furthermore, the Scottish Ministers advise that the impact on the Air Defence Radar at Remote Radar Head Benbecula be scoped into the EIA Report for further assessment and refer the Developer to the MOD representation in this regard”.</i>	Remote Radar Head (RRH) Benbecula/ <i>Beinn nam Fadhla</i> has been included within the Radar Line of Sight (RLoS) Assessment as part of Appendix 17.1, Volume 2c . The impact to RRH Benbecula/ <i>Beinn nam Fadhla</i> is assessed within Section 17.9.
MD-LOT and Highlands and Islands Airports Limited (HIAL)	Scoping Opinion May 2024	5.2.11.3 <i>“The Developer details the proposed approach to assessment within section 6.11.6.4 of the Scoping Report. The Scottish Ministers direct the Developer to the Highlands and Islands Airport (“HIAL”) representation which requests an Aviation Impact Feasibility Study of the Proposed Development is undertaken to better understand any potential impacts to aviation. The Scottish Ministers advise the Developer engages with HIAL to ensure the Proposed Development does not impact the</i>	An Instrument Flight Procedure (IFP) assessment has been undertaken to determine impacts to Stornoway/ <i>Steòrnabhagh</i> Airport see Appendix 17.1, Volume 2c and further assessed within Sections 17.8, 17.9, and 17.10.

Consultee	Date / Document	Comment	Response/where this is addressed in the EIAR
		<i>safeguarding criteria and operation of Stornoway Airport”.</i>	
MD-LOT	Scoping Opinion May 2024	<i>5.2.11.4 “The Developer considers embedded mitigation within section 6.11.4 of the Scoping Report. The Scottish Ministers, in line with the MOD representation, advise that impacts to radar systems will require technical mitigation which must be provided by the Developer and accepted by the MOD. The Scottish Ministers direct the Developer to the MOD representation with regard to aviation lighting which should be considered in the EIA Report”.</i>	RRH Benbecula/Beinn nam Fadhlà and St Kilda/Hiort have been included within the RLoS Assessment as part of Appendix 17.1, Volume 2c . The impact to RRH Benbecula/Beinn nam Fadhlà is assessed within Section 17.9. Military marking and lighting criteria are covered under Section 17.7.2.
MD-LOT and Comhairle nan Eilean Siar (Council of the Western Isles)	Scoping Opinion May 2024	<i>“In terms of cumulative impacts, the Scottish Ministers are content that there will be no spatial overlap with the Space Launch Hazard Area. This is in line with the Comhairle nan Eilean Siar representation.”</i>	Response noted by the Applicant. The Spaceport 1 project has not been considered further in the cumulative effects assessment.
HIAL	Scoping Opinion 8 November 2023	<i>“Please see CAP785 requirement. The IFP Assessment MUST be produced by an Approved Procedure Design Organisation (APDO). A list of APDO can be found on the CAA website: Approved procedure design organisations Civil Aviation Authority (caa.co.uk)”.</i>	An IFP assessment (Appendix 17.2, Volume 2c) has been undertaken to determine impacts to Stornoway/Steòrnabhagh Airport and further assessed within Sections 17.8, 17.9, and 17.10.
HIAL	Scoping Opinion 8 November 2023	<i>“For further information please refer to Advice Note 2 ‘Lighting’ (available at http://www.aoa.org.uk/policycampaigns/operations-safety). Please also consider the lighting requirements as documented in The Air Navigation Order 2016, Article 222”.</i>	Aviation lighting is a statutory requirement under ANO Art 223 and will be included within the Lighting and Marking Plan (LMP) (M033), see Table 17-12 .
MOD	Scoping Opinion 15 February 2024	<i>“Impact on military activity has been recognised in Chapter 6.11.3.2 as the developer has identified Danger area D701 which is used for a number of purposes including aerial towed targets, unmanned</i>	Danger Area D701 is acknowledged in Appendix 17.1, Volume 2c (referred to as EGD701) and Section 17.6.1.

Consultee	Date / Document	Comment	Response/where this is addressed in the EIAR
		<p><i>aerial vehicle operations, gunnery and calibrated firing and trials. The range operator is correctly identified as Qinetiq, who have confirmed there are no concerns with this proposed development”.</i></p>	
MOD	<p>Scoping Opinion 15 February 2024</p>	<p><i>“In Chapter 6.11.4 of the scoping report the requirements to facilitate safe visual flight, day or night in the vicinity of WTG’s are outlined. In this case, the development does not impact the military low flying systems or any managed Danger Areas. The applicant has considered charting the development, which the MOD would request, and in the interests of air safety, the MOD would also request that the development be fitted with MOD accredited aviation safety lighting in accordance with the Civil Aviation Authority, Air Navigation Order 2016”.</i></p>	<p>WTGs will be fitted with military accredited lighting as per Embedded Mitigation Measure M033. See Table 17-12.</p>
NATS	<p>Scoping Opinion 15 December 2023</p>	<p><i>“We refer to Application SCOP-0032 for Spiorad na Mara, an Offshore Windfarm located off the Isle of Lewis. We note that currently only high-level details are available, however NATS has used this information to undertake a preliminary assessment.</i></p> <p><i>Using the boundary points and a reduced number of sample turbine locations, NATS has undertaken some modelling which highlights the potential for some degradation to the radio communication signals serving part of the airspace North and West of the wind farm. This airspace is served by the NATS air-ground-air radio station located on the North-Western side of the Isle of Lewis. While the modelling has shown the volume of impact to be quite limited, and prevalent at lower altitudes, engagement with our Air Traffic Control customers indicates that the airspace in question is of significance to low level air traffic operations. Accordingly there is the possibility of an unacceptable impact on</i></p>	<p>NATS AGA radio stations have been assessed within Appendix 17.1, Volume 2c.</p> <p>Engagement with NATS will continue to ensure that the potential impact to their radio communications is reduced to an acceptable level or removed entirely.</p>

Consultee	Date / Document	Comment	Response/where this is addressed in the EIAR
		<p><i>Aviation. As the area of impact has only been theoretically modelled, and its extent will be affected by the wind farm design, our request is that Aviation is scoped in and that the Applicant engages with NATS in order to identify an acceptable design for the project. It is hoped that through careful design and location of the turbine field, the impact to aviation radio communications can be reduced to an acceptable level or be completely eliminated".</i></p>	

17.3.2 POST SCOPING CONSULTATION

- 17.3.2.1 Following the receipt of the Scoping Opinion, further consultation relating to Military and Civil Aviation has been held with a number of stakeholders. A summary of this consultation is detailed in **Table 17-3**.

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Table 17-3 Summary of post scoping consultation for Military and Civil Aviation

Consultee	Date / Document	Comment/Summary of consultation	Response/where this is addressed in the EIAR
Met Office	Post-Scoping Opinion Email 11 March 2024	<p><i>"...the proposed turbines would be in the beam of the at Drium-A-Starraig weather radar at its lowest elevation scan (0.5 deg). Thus we have concerns about the proposal but may be able to accept the adverse impact so long as the proposed turbines are below the beam of the radar at its next elevation scan (1.0 deg)".</i></p> <p><i>"The Met Office confirms that we expect to be included in a suitable assessment to fully consider the potential effects from the proposed development on the Met Office weather radar at Drium-A-Starraig".</i></p>	Modelling conducted in Appendix 17.1, Volume 2c determined that WTGs with a maximum tip height of 338.4 m Above Mean Sea Level (AMSL) will not be within the 1.0° elevation scan of Drium A'Starraig and the proposed weather radar site, Campar Mor. The Met Office confirmed that the impact to the Met Office radar is deemed acceptable, see Table 17-6 . This impact is discussed further within Section 17.9.
	Post-Scoping Opinion Email 19 September 2024	<p><i>"Your modelling looks correct to me, the turbines would be in the lowest elevation 0.5 deg beam (whose base at 0 deg, top at 1.0 deg) but not the next 1.0 deg beam at 1.0 deg (whose base at 0.5 deg, top at 1.5 deg). If you are able to demonstrate that all the turbines would be below the 1.0 deg beam we would be able to accept the impact".</i></p>	
	Post-Scoping Opinion Email 29 May 2025	<p><i>"Thanks for sending the draft modelling report, it looks very comprehensive. You have demonstrated that the wind turbines in the proposed windfarm are all below the 1.0 deg beam of the nearest weather radars, therefore I'm pleased to confirm that we would be able to manage any impacts and wouldn't raise any objections to a planning application.</i></p> <p><i>Just one comment re para 3.6.1 of the modelling report. Although our safeguarded consultation zone is 20 km onshore, we are referenced in the National Policy Statement for energy (EN-1), which acknowledges that wind turbines have the potential to impact weather radars even beyond 100 km and applicants should consult the Met Office, see</i></p>	

Consultee	Date / Document	Comment/Summary of consultation	Response/where this is addressed in the EIAR
		<p>https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1/overarching-national-policy-statement-for-energy-en-1 (section 5.5)."</p>	
NATS	Post-Scoping Opinion Email 2 June 2025	<p>"NATS carries out our AGA assessments in accordance with the process published by our regulator CAP 670 (Appendix A to GEN 02)".</p> <p>"For "Large Industrial" turbines (up to a tip of 158m) CAP670 has an assessment distance of 17.2km and although figures are not supplied above this a considerably longer assessment range is implied for turbines in the 290 to 340m range. Even at 17.2km this site lies within the assessment distance of our equipment at Forsnaval."</p> <p>"Being within the assessment distance does not necessarily imply a problem, it just requires us to carry out a carrier-to-interference, C/I, assessment and then judge the operational significance of the volume within which this C/I threshold is breached. NATS will endeavour to carry out C/I assessments of the proposed smaller turbines and share any conclusions we come to."</p>	<p>The Array Area is located 14.3 km to the north of the nearest NATS AGA communication facility, Forsnaval/Forsnabhal. WTGs within close proximity of radio communication facilities have the potential to cause signal interference. NATS AGA radio stations have been assessed within Appendix 17.1, Volume 2c.</p> <p>Considering the already limited degradation to Forsnaval/Forsnabhal from WTGs, NATS were engaged and provided the current parameters considered at EIA stage, highlighting the reduced WTG quantity and height.</p> <p>Engagement with NATS will continue to ensure that the potential impact to their radio communications is reduced to an acceptable level or removed entirely.</p>
Defence Infrastructure Organisation (DIO)	Post-Scoping engagement (June – August 2025)	In response to the Project's second PAC, DIO requested revised Project information (i.e. changes to the Project design since Scoping) to be shared for them to undertake a re-assessment. Information included Offshore Project coordinates and WTG parameters (hub height, rotor diameter, blade tip height, generation capacity).	RLoS modelling within Appendix 17.1, Volume 2c indicated that RRH Benbecula/Beinn nam Fadhlha may have RLoS of WTGs within the northwest section of the Array Area.

Consultee	Date / Document	Comment/Summary of consultation	Response/where this is addressed in the EIAR
		<p>Following receipt of Project information, DIO confirmed that re-assessments were undertaken based on the new information and confirmed that their position outlined in the Scoping Opinion remained (Table 17-2).</p> <p>The mitigation solution was provided to the DIO who were also requested to advise on how the Applicant may procure an appropriate mitigation route for RRH Benbecula/<i>Beinn nam Fadhla</i>.</p>	<p>Potential mitigation strategies were highlighted for RRH Benbecula/<i>Beinn nam Fadhla</i>, including the establishment of a Non Auto Initiation Zone (NAIZ) around the vicinity of the Array Area within RLoS.</p> <p>The impact to RRH Benbecula/<i>Beinn nam Fadhla</i> is assessed within Section 17.9.</p> <p>Military marking and lighting criteria are covered under Section 17.7.2, see Table 17-12.</p>
HIAL	Post-Scoping engagement	The Applicant completed the IFP assessment and shared this with HIAL for comment (July 2025).	

Consultee	Date / Document	Comment/Summary of consultation	Response/where this is addressed in the EIAR
	(July – December 2025)	<p>HIAL carried out an ATC/AIFS operational assessment to evaluate the potential impacts of the proposed IFPs on Stornoway Airport. This operational assessment noted the same concerns as the Applicant’s IFP assessment. Following this, HIAL carried out a revised ATC operational assessment to confirm acceptance of the proposed mitigations.</p> <p>HIAL confirmed that the proposed changes outlined in the IFP assessment are minimal in nature, and have stated that they have no objection with a proposed IFP condition to address this.</p>	<p>An IFP assessment (Appendix 17.2, Volume 2c) has been undertaken to determine impacts to Stornoway/<i>Steòrnabhagh</i> Airport and further assessed within Sections 17.8, 17.9, and 17.10.</p> <p>The IFP assessment was shared with HIAL for review and to discuss the findings. Following review, HIAL have confirmed that the mitigation proposed is suitable assuming that a condition is included in the Offshore Project’s consents.</p>

17.4 SCOPE OF THE ASSESSMENT

17.4.1 OVERVIEW

17.4.1.1 This section sets out the scope of the EIA assessment for Military and Civil Aviation. This scope has been developed as the Offshore Project design has evolved and responds to feedback received to date as set out in Section 17.3.

17.4.2 SPATIAL SCOPE AND STUDY AREA

17.4.2.1 The spatial scope of the Military and Civil Aviation assessment is defined as a 60 nautical miles (nm) (111.12 km) buffer zone around the Array Area, this has formed the basis of the study area described in this section.

17.4.2.2 In considering the spatial coverage of the Military and Civil Aviation study area, the overriding factor is the potential for WTGs within the Array Area to impact military and civil radars, taking into account the required radar operational ranges. In general, aerodrome Primary Surveillance Radars (PSRs) have a range of between 40 nm-60 nm (74.08 km-111.12 km). All radar equipped airfields within 60 nm (111.12 km) of the Array Area have been included within the study area. En route radars operated by NATS and military Air Defence (AD) radars can provide coverage at ranges in excess of 60 nm (111.12 km) and so, all such radars with potential RLoS of WTGs located within the Array Area are also included within the study area.

17.4.2.3 The Military and Civil Aviation study area includes the airspace between the Array Area and the UK mainland, extending from St Kilda/*Hiort* to the southwest, to the proposed weather radar site at Campar Mor to the east. Airports and radars within the study area that are under consideration are shown in **Figure 17-1, Volume 2b**. Criteria used to identify receptors within the study area are detailed in the following sections.

Civil Aerodromes

17.4.2.4 CAP 764: Policy and Guidelines on Wind Turbines (CAA, 2025) states the distances from various types of aerodromes where consultation should take place. These distances include:

- Aerodromes with a surveillance radar – within 30 km;
- Non-radar equipped licensed aerodromes with a runway of 1,100 m or more – within 17 km;
- Licensed aerodromes where the WTGs would lie within airspace coincidental with any published IFP;
- Non-radar equipped licensed aerodrome with a runway less than 1,100 m – within 5 km;
- Unlicensed aerodromes with runways of more than 800 m – within 4 km;
- Unlicensed aerodromes with runways of less than 800 m – within 3 km;
- Gliding sites within 10 km;

- Other aviation activity such as parachute sites and microlight sites within 3 km.

17.4.2.5 CAP 764 goes on to state that these distances are for guidance purposes only and do not represent ranges beyond which all WTG developments will be approved or within which they will be objected to. For example, aerodromes may utilise their radars at ranges considerably in excess of 30 km.

17.4.2.6 As well as examining the technical impact of WTGs on Air Traffic Control (ATC) facilities, it is also necessary to consider the physical safeguarding of ATC operations using the criteria laid down in CAP 168: Licensing of Aerodromes (CAA, 2022a) to determine whether a proposed development has potential to breach obstacle clearance criteria at any aerodromes.

17.4.2.7 CAP 738: Safeguarding of Aerodromes (CAA, 2020) provides guidance to help assess what impact a proposed development or construction might have on aerodrome operations. Aerodrome Safeguarding covers several aspects including the protection of:

- The airspace around an aerodrome to ensure no buildings or structures may cause danger to aircraft either in the air or on the ground. This is achieved through both the Obstacle Limitation Surfaces and the IFP assessments;
- The integrity of radar and other electronic aids to navigation by preventing reflections and diffractions of the radio signals;
- Aircraft from the risk of collision with obstacles through appropriate lighting.

17.4.2.8 CAP 785B: Implementation and Safeguarding (CAA, 2022b) of IFPs in the UK details the technical requirements and the process by which IFP safeguarding is carried out.

Military Aviation

17.4.2.9 It is necessary to consider the aviation and AD activities of the MOD. This includes:

- MOD airfields, both radar and non-radar equipped;
- MOD AD radars;
- MOD ATC radars;
- MOD PEXAs for both aviation and non-aviation activities.

NATS Facilities

17.4.2.10 It is necessary to consider the possible effects of WTGs upon NATS en route electronic infrastructure; a UK-wide network of primary and secondary radars and navigation and communication facilities.

Other Aviation Activities

17.4.2.11 Other aviation activities under consideration include military and civilian 'off-route' fixed wing and helicopter operations in support of offshore wind developments, SAR operations, the oil and gas industry and military low flying operations.

17.4.2.12 WTGs have the potential to adversely impact meteorological radio facilities such as weather radar. The Met Office must be consulted on WTG proposals that are within a 20 km radius zone of any of their UK weather radar sites. Although the Array Area is not located within 20 km of any existing or proposed weather radar sites, WTGs can still adversely affect weather radars. Any weather radar with potential RLoS of WTGs within the Array Area have been considered.

17.4.3 TEMPORAL SCOPE

17.4.3.1 The temporal scope of the assessment of Military and Civil Aviation is the entire lifetime of the Offshore Project, which therefore covers the construction, O&M, and decommissioning phases. The construction phase is anticipated to be between 2028 and 2033. The O&M phase is expected to last for a minimum of 35 years. It is anticipated that the decommissioning phase will consist of the reverse of the construction phase, including a similar duration.

17.4.4 POTENTIAL RECEPTORS

17.4.4.1 The spatial and temporal scope of the assessment enables the identification of receptors which may experience a change as a result of the Offshore Project. The receptors identified that may experience likely significant effects for Military and Civil Aviation are outlined in **Table 17-4**.

Table 17-4: Receptors requiring assessment for Military and Civil Aviation

Receptor Group	Receptors included within group
Civil Aerodromes	Stornoway/ <i>Steòrnabhagh</i> Airport IFPs.
Military Activities	Military low flying activities and RRH Benbecula/ <i>Beinn nam Fadhla</i> AD radar.
NATS Facilities	NATS Forsnaval radio communication facility.
Meteorological Facilities	Druim A'Starraig weather radar and the proposed Campar Mor weather radar.
Other aviation activities	Offshore fixed-wing and helicopter traffic, including helicopters operations in support of offshore wind developments and SAR operations.

Civil Aerodromes

17.4.4.2 An IFP is a set of instructions used by aircraft navigating aerodromes by reference to flight instruments. The IFP gives pilots reassurance of properly designated obstacle and terrain clearance whilst manoeuvring in poor weather. Within their scoping response, HIAL requested that an IFP assessment is completed to identify any potential impacts the Offshore Project may have to Stornoway/*Steòrnabhagh* Airport IFPs. An IFP assessment has been undertaken to determine if IFPs at Stornoway/*Steòrnabhagh* Airport will be impacted.

Military Activities

17.4.4.3 Within their scoping response (MD-LOT, 2024), the MOD highlighted that whilst the Offshore Project may not impact controlled military airspace, MOD accredited lighting and marking is

required to mitigate the impact to military low flying activities. Specifically, the Array Area is located within the day-time Low Flying Area (LFA) 14, and night-time LFA 1BW (**Figure 17-2, Volume 2b**).

17.4.4.4 The MOD also requested within their scoping response (MD-LOT, 2024) that RRH Benbecula/*Beinn nam Fadhma* is scoped in as a potential receptor.

NATS Facilities

17.4.4.5 Initially scoped out in the Scoping Report, NATS raised concerns regarding their AGA communication facility. Within their scoping response (MD-LOT, 2024), NATS stated that theoretical modelling indicates that WTGs may cause degradation to radio communication signals to the north and west of the Array Area.

Meteorological Facilities

17.4.4.6 The Met Office raised concerns that WTGs within the Array Area may impact their existing weather radar, Druim A'Starraig. Within this response, the Met Office stated that this impact may be acceptable providing WTGs are not within RLoS at an elevation scan of 1.0°.

17.4.4.7 The Met Office subsequently provided the parameters necessary to assess their proposed radar site, Campar Mor.

Other Aviation Activities

17.4.4.8 The introduction of an aviation obstacle environment and increased air traffic associated with the Offshore Project may impact offshore fixed-wing and helicopter traffic, including helicopters conducting SAR operations.

17.4.5 ACTIVITIES OR IMPACTS SCOPED INTO THE ASSESSMENT

17.4.5.1 Potential impact on Military and Civil Aviation receptors that have been scoped in for assessment are summarised in **Table 17-5**.

Table 17-5: Activities or impacts scoped into the assessment for Military and Civil Aviation

Receptor	Activity or Impact	Potential Effect
Construction		
1. Military low flying activity. 2. Aircraft flying Stornoway/ <i>Steòrnabhagh</i> Airport IFPs. 3. Offshore helicopter operations 4. SAR helicopters	Creation of an aviation obstacle environment.	Increased collision risk to aircraft flying under IFPs at Stornoway/ <i>Steòrnabhagh</i> Airport, low lying military aircraft in the vicinity of the Array Area, offshore fixed wing and helicopter operations, including those undertaking SAR operations.

Receptor	Activity or Impact	Potential Effect
1. Military low flying activity. 2. Aircraft flying Stornoway/Steòrnabhagh Airport IFPs. 3. Offshore helicopter operations 4. SAR helicopters	Increased air traffic in relation to wind farm activities.	The increase in air traffic brings with it a potential increased possibility of aircraft collision for low flying military aircraft, and offshore fixed wing and helicopter operations, including those undertaking SAR operations.
Operation and Maintenance		
1. Military low flying activity. 2. Offshore helicopter operations 3. SAR helicopters	Creation of an aviation obstacle environment.	The creation of a new aviation obstacle environment may pose a physical obstruction to low flying military aircraft in the vicinity of the Array Area, and offshore fixed wing and helicopter operations, including those undertaking SAR operations.
1. Military low flying activity. 2. Offshore helicopter operations 3. SAR helicopters	Increased air traffic in relation to wind farm activities.	The increase in air traffic brings with it a potential increased possibility of aircraft collision for low flying military aircraft, and offshore fixed wing and helicopter operations, including those undertaking SAR operations.
RRH Benbecula/ <i>Beinn nam Fadhla</i> .	Impact to military radars.	When operational (blades rotating), WTGs have the potential to generate 'clutter' (or false targets) upon radar displays because current generation PSRs are unable to distinguish between primary radar returns generated by WTGs and aircraft.
NATS Forsnaval AGA Communication facility.	Impact to NATS radio communications.	WTGs have the potential to cause interference to Very High Frequency (VHF) and Ultra High Frequency (UHF) communication systems.
Decommissioning		
1. Military low flying activity. 2. Offshore helicopter operations 3. SAR helicopters	Creation of an aviation obstacle environment.	The changing of the aviation obstacle environment from infrastructure in the O&M phase may pose a physical obstruction to low flying military aircraft in the vicinity of the Array Area. The use of helicopters in support of the decommissioning phase of the Offshore Project may impact on existing traffic in the vicinity of the Array Area.

Receptor	Activity or Impact	Potential Effect
		The increase in air traffic and physical obstructions bring with it a potential increased possibility of aircraft collision. The air traffic and physical obstructions will be reduced as the decommissioning stage is progressed with the potential effect reducing to the baseline conditions once complete. Aviation lighting and marking of infrastructure will remain present until the wind farm has been decommissioned.

17.4.6 ACTIVITIES OR IMPACTS SCOPED OUT OF ASSESSMENT

17.4.6.1 A number of potential effects have been scoped out from further assessment, resulting from a conclusion of no likely significant effect. These conclusions have been made based on the knowledge of the baseline environment, the nature of planned works and the wealth of evidence on the potential for impact from such projects more widely. The conclusions follow (in a site-based context) existing best practice. Each scoped out activity or impact is considered in turn in **Table 17-6**.

Table 17-6: Activities or impacts scoped out of assessment for Military and Civil Aviation

Activity or impact	Rationale for scoping out
Interference with Secondary Surveillance Radar (SSR) systems.	The closest SSR to the Array Area is NATS Sandwick, located 29.2 km to the southeast. CAP 764 states that impacts to SSR caused by WTGs are typically only a consideration when they are located within 10 km. To protect their SSR, NATS have established a safeguarded zone of 28 km around their facilities. The Array Area is located outside of this zone. In their scoping response (MD-LOT, 2024), NATS did not raise any concerns regarding SSRs. Interference with SSR systems is therefore scoped out from consideration in the EIAR.
Impact to military radar at St Kilda/ <i>Hiort</i> .	The nearest military ATC radar to the Array Area is St Kilda/ <i>Hiort</i> (outlined in Figure 17.1, Volume 2b), operated by QinetiQ. RLoS analysis conducted within Appendix 17.1, Volume 2c indicates that St Kilda/ <i>Hiort</i> may have RLoS of WTGs with a maximum tip height of 338.4 m AMSL. Within their scoping response (MD-LOT, 2024), the MOD stated that QinetiQ confirmed they have no concerns regarding the Offshore Project. Therefore, impacts to military radar at St Kilda/ <i>Hiort</i> are scoped out from consideration in the EIAR.
Impact to Royal Air Force (RAF) Lossiemouth.	The Array Area is located significantly beyond the range of the nearest military airfield, RAF Lossiemouth is located 207 km to the east southeast. Within their scoping response (MD-LOT, 2024), the MOD agreed that impacts to RAF

Activity or impact	Rationale for scoping out
	Lossiemouth should be scoped out. Therefore, impacts to RAF Lossiemouth are scoped out from consideration in the EIAR.
Impact to RRH Benbecula/ <i>Beinn nam Fadhla</i> during the construction and decommissioning phases.	To discriminate wanted aircraft targets from unwanted clutter, PSRs ignore static objects and only display moving targets. PSRs that can see the rotating blades of WTGs can mistake them for aircraft and so present them on the radar display as clutter. Until WTG blades in RLoS are allowed to rotate, they will not generate PSR clutter. Therefore, impacts to RRH Benbecula/ <i>Beinn nam Fadhla</i> during the construction and decommissioning phases are scoped out from consideration in the EIAR.
Impact to military PEXAs.	Within their consultation response (MD-LOT, 2024), the MOD stated the range operator (QinetiQ) of the nearest military Danger Area D701 confirmed they had no concerns with the Offshore Project. Therefore, impacts to military PEXAs are scoped out from consideration in the EIAR.
Impact to offshore helidecks.	To help achieve a safe operating environment, CAP 764 establishes a 9 nm (16.7 km) consultation zone for planned obstacles around offshore helicopter destinations. Within 9 nm, obstacles such as WTGs can potentially impact upon the feasibility of helicopters to safely fly during low visibility or missed approach procedures at their associated helideck site. The nearest active offshore helideck to the Array Area is the Captain WPPA, located 282 km to the east, far from the established 9 nm (16.7 km) consultation zone. Therefore, impacts to offshore helidecks are scoped out from consideration in the EIAR.
Impact to Stornoway/ <i>Steòrnabhagh</i> Airport IFPs.	Any potential impact to Stornoway/ <i>Steòrnabhagh</i> Airport IFPs will be addressed and mitigated prior to the construction of WTGs and Offshore Substation Platform (OSP). Thereafter, during O&M phase and the decommissioning phase, there will be no impact to Stornoway/ <i>Steòrnabhagh</i> Airport IFPs. Impacts to Stornoway/ <i>Steòrnabhagh</i> Airport IFPs have therefore been scoped out from consideration in the EIAR.
Impact to Weather Radars.	The Met Office stated that they can accept the impact to their current weather radar Druim A'Starraig and their proposed weather radar, Campar Mor, if WTGs are not within a 1° elevation scan of the radars. Modelling within Appendix 17.1, Volume 2c indicates that WTGs with a maximum tip height of 338.4 m AMSL will not be within an elevation scan of 1° to both radars. This modelling was presented to the Met Office and they confirmed they could manage any impact, and would not object to the planning application.

17.5 METHODOLOGY FOR BASELINE DATA GATHERING AND IMPACT ASSESSMENT

17.5.1 METHODOLOGY FOR BASELINE DATA GATHERING

Overview

17.5.1.1 Baseline data collection has been undertaken to obtain information over the study area described in Section 17.4. The current baseline conditions presented in Section 17.6 sets out currently available information from the study area.

17.5.1.2 There have been no surveys undertaken for the Military and Civil Aviation assessment.

Desk Study

17.5.1.3 For the purposes of this Military and Civil Aviation chapter, a desk-based review has been undertaken using relevant data sources. The primary sources of aviation related data used for this study are the UK civil and military AIPs. The AIPs contain details on airspace and en route procedures as well as en route and aerodrome charts and other air navigation information.

17.5.1.4 The data sources that have been collected and used to inform this Military and Civil Aviation assessment is summarised in **Table 17-7**. These sources have been used to determine aviation stakeholders that may be affected by the Offshore Project, including all radar systems within operational range.

Table 17-7: Data sources used to inform the military and civil aviation EIA.

Source	Date	Summary	Coverage of study area
NATS AIP, CAP 032	February 2025	The main resource for information and flight procedures at all licensed UK airports as well as airspace, en route procedures, charts and other air navigation information.	Full coverage of the study area.
UK Military AIP	February 2025	The main resource for information and flight procedures at all UK military aerodromes and military airspace.	Full coverage of the study area.
Wind farm self-assessment maps, NATS.	2012	Maps provided by NATS to ascertain potential impact of WTGs on their en route electronic infrastructure. This includes NATS PSR, SSR, and AGA locations and safeguarded areas.	Full coverage of the study area.

Source	Date	Summary	Coverage of study area
Operational Programme for the Exchange of Weather Radar Information (OPERA), EUMETNET.	February 2025	Contains locations and antenna heights of weather radars throughout Europe.	Full coverage of the study area.
UK weather radar sites, Met Office.	February 2025	Online maps of consultation zones for safeguarding UK weather radar sites.	Full coverage of the study area.
Protected radar list Ofcom.	August 2024	Locations and heights of military and civil PSRs in the 2.7 GHz band.	Full coverage of the study area.
Offshore Infrastructure North Sea Transition Authority (NSTA).	February 2025	Shapefile containing offshore oil and gas platforms within UK territorial waters.	Full coverage of the study area.
Helicopter Landing Area Certificates, Helideck Certification Agency (HCA).	February 2025	Contains the certificates for offshore oil and gas platform helidecks.	Full coverage of the study area.

17.5.2 DATA LIMITATIONS AND ASSUMPTIONS

17.5.2.1 There are no data limitations relating to Military and Civil Aviation that affect the robustness of this EIAR.

17.5.3 METHODOLOGY FOR ENVIRONMENTAL IMPACT ASSESSMENT

Introduction

17.5.3.1 The project-wide generic approach to assessment is set out in **Chapter 5, Volume 1a**. The assessment methodology for Military and Civil Aviation for the EIAR is consistent with that provided in the Scoping Report (2023) and no changes have been made since the scoping phase. The following sections provide the assessment methodology used to assess the potential impacts on Military and Civil Aviation only.

Magnitude

17.5.3.2 The magnitude criteria for Military and Civil Aviation are provided in **Table 17-8**. In determining magnitude, each assessment considered the spatial extent, duration, frequency, and reversibility of impact and these are outlined within the magnitude section of each assessment of impact (e.g. a duration of hours would be considered for most receptors to be of short-term duration, which is likely to result in a low magnitude of effect).

Table 17-8: Definition of magnitude for Military and Civil Aviation.

Magnitude Value	Description
Negligible	Very slight change from baseline condition and/or physical extent of impact is negligible and/or short-term duration (i.e. less than 2 years) and/or frequency of repetition is negligible to continuous and/or effect is reversible.
Low	Minor shift away from baseline, leading to a reduction in level of activity that may be undertaken and/or physical extent of impact is low and/or short to medium term duration (i.e. construction phase) and/or frequency of repetition is low to continuous and/or effect is not reversible for Offshore Project phase.
Medium	Loss or alteration to significant portions of key components of current activity and/or physical extent of impact is moderate and/or medium-term duration (i.e. operational phase) and/or frequency of repetition is medium to continuous and/or effect is not reversible for Offshore Project phase.
High	Total loss of ability to carry on activities and/or impact is of extended physical extent and/or long-term duration (i.e. total life of the Offshore Project) and/or frequency of repetition is continuous and/or effect is not reversible for Offshore Project.

Sensitivity (and value)

17.5.3.3 The sensitivity criteria for Military and Civil Aviation receptors are provided in **Table 17-9**.

Table 17-9: Definition of sensitivity for Military and Civil Aviation.

Sensitivity Value	Description
Negligible	Receptor, or the activities of the receptor, is of negligible value to the local, regional or national economy and/or the receptor or the activities of the receptor, is not vulnerable to impacts that may arise from the Offshore Project and/or has high recoverability.
Low	Receptor, or the activities of the receptor, is of low value to the local, regional or national economy and/or the receptor or the activities of the receptor, is not generally vulnerable to impacts that may arise from the Offshore Project and/or has high recoverability.
Medium	Receptor, or the activities of the receptor, is of moderate value to the local, regional or national economy and/or the receptor or the activities of the receptor, is somewhat vulnerable to impacts that may arise from the Offshore Project and/or has moderate to high levels of recoverability.
High	Receptor, or the activities of the receptor, is of high value to the local, regional or national economy and/or the receptor or the activities of the receptor, is generally vulnerable to impacts that may arise from the Offshore Project and/or recoverability is slow and/or costly.

Significance

17.5.3.4 In assessing the significance of the effects from the Offshore Project it is necessary to identify whether or not there may be an impact (both adverse and beneficial) on Military and/or Civil Aviation operations. By assigning and combining magnitude and the sensitivity criteria, overall effect significance upon Military and Civil Aviation receptors can be determined as defined in **Table 17-10**.

Table 17-10: Significance rating matrix.

Sensitivity	Magnitude of Effect			
	Negligible	Low	Medium	High
Negligible	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)
Low	Negligible (Not Significant)	Negligible (Not Significant)	Minor (Not Significant)	Minor (Not Significant)
Medium	Negligible (Not Significant)	Minor (Not Significant)	Moderate (Potentially Significant)	Moderate (Potentially Significant)
High	Negligible (Not Significant)	Minor (Not Significant)	Moderate (Potentially Significant)	Major (Significant)

17.5.3.5 Minor and Negligible effects are not significant in EIA terms. Major effects are significant in EIA terms. Moderate effects are potentially significant, subject to the assessors professional judgement, with these assessments explained where they occur.

17.6 BASELINE CONDITIONS

17.6.1 CURRENT BASELINE

17.6.1.1 Baseline data collection has been undertaken to obtain information over the study areas described in Section 17.4. A summary of the baseline environment has been derived from the results of the desk study data detailed in Section 17.5 and is outlined in this section.

Civil Aviation

17.6.1.2 The Array Area is located within the Scottish Flight Information Region (FIR) for ATC, and the airspace is regulated by the UK CAA. The boundary between the Scottish FIR and London FIR, also regulated by the UK CAA, is located approximately 380 km to the south southeast of the Array Area. Located approximately 178 km to the west of the Array Area is the Shanwick FIR boundary (**Figure 17-3, Volume 2b**), also regulated by the UK CAA.

- 17.6.1.3 NATS provide en route civil Air Traffic Services (ATS) within these FIRs and operate a network of radar facilities which provide en route information on airborne traffic for both military and civil ATC.
- 17.6.1.4 Airspace is classified as either controlled or uncontrolled and is divided into a number of classes depending on what kind of ATS is provided and under what conditions. In the UK, there are 5 classes of airspace. Classes A, C, D and E are controlled airspace classes, within which aircraft are monitored and instructed by ATC, while Class G is uncontrolled, within which aircraft are not subject to ATC instruction but rather operate according to a simple set of regulations. ATC may still provide information, if requested, to ensure flight safety.
- 17.6.1.5 Aircraft operate under one of two flight rules: VFR or IFR. VFR flight is permitted when the weather satisfies Visual Meteorological Conditions (VMC) and is conducted with visual reference to the natural horizon. Aircraft must be flown under IFR when weather restricts visibility, known as Instrument Meteorological Conditions (IMC). IFR flight requires reference solely to aircraft instrumentation.
- 17.6.1.6 From sea level to Flight Level (FL) 195 (approximately 19,500 ft AMSL), the airspace in the vicinity of the Array Area is Class G uncontrolled airspace. This airspace is used predominately by low level flight operations and generally by aircraft flying under VFR, meaning pilots fly and navigate with visual reference to the natural horizon and terrain features. Pilots are required to maintain distances from notified obstacles, including WTGs, and may only fly within the minimum weather and visibility criteria.
- 17.6.1.7 Above FL 195, there is Class C controlled airspace in the form of a Temporary Reserved Area (TRA). This airspace, TRA 008A, has an upper vertical limit of FL 245 (approximately 24,500 ft AMSL) and is available for use by both military and civil aircraft, though its main use is to accommodate VFR military flying activity. Above the TRA, the upper limit of Class C controlled airspace is FL 660 (approximately 66,000 ft AMSL).
- 17.6.1.8 Laterally, the nearest controlled airspace to the Array Area is the Moray Control Area (CTA) 9, located 34.1 km to the southwest. This airspace has vertical limits of FL 55 to FL 195 (approximately 5,500 ft to 19,500 ft AMSL respectively) and is Class E controlled airspace and a Transponder Mandatory Zone (TMZ). Within a TMZ, the carriage and operation of aircraft transponder equipment is mandatory. This enables such aircraft to be detected and tracked by SSR systems.
- 17.6.1.9 **Plate 17-1** provides a description of UK airspace classifications

Plate 17-1 UK Airspace classifications (Source: Civil Aviation Authority, 2008)

UK ATS AIRSPACE CLASSIFICATIONS						
	A	C	D	E	G	
I F R	ATC SEPARATION PROVIDED	IFR ↔ IFR	IFR ↔ IFR VFR SVFR †	IFR ↔ IFR SVFR †	IFR ↔ IFR	UK FLIGHT INFORMATION SERVICES
	TRAFFIC INFORMATION PROVIDED		IFR ATC VFR Air traffic avoidance advice O/R.	IFR ATC VFR Air traffic avoidance advice O/R.	IFR ATC VFR (when practicable)	Procedural, Deconfliction Traffic, Basic
	SPEED LIMITATION	Not applicable (unless notified for ATC purposes)	Not applicable (unless notified for ATC purposes)	below FL100 250 KIAS	below FL100 250 KIAS	below FL100 250 KIAS
	RADIO					Not required
	ATC CLEARANCE REQUIRED?	YES	YES	YES	YES	NO
V F R	ATC SEPARATION PROVIDED	VFR FLIGHT NOT PERMITTED	VFR SVFR † ↔ IFR SVFR †	SVFR † ↔ IFR SVFR †	UK FLIGHT INFORMATION SERVICES	UK FLIGHT INFORMATION SERVICES
	TRAFFIC INFORMATION PROVIDED		VFR ATC VFR	VFR ATC IFR VFR	Traffic, Basic	Traffic, Basic
	VMC MINIMA	The VMC minima in Class A airspace are included for guidance to pilots and do not imply acceptance of VFR flights in Class A airspace.		OR † 3000FT AMSL 140KT or less 5KM * clear of cloud in sight		
	SPEED LIMITATION	VFR FLIGHT NOT PERMITTED	below FL100 250 KIAS	below FL100 250 KIAS	below FL100 250 KIAS	below FL100 250 KIAS
	RADIO	VFR FLIGHT NOT PERMITTED			Not required	Not required
ATC CLEARANCE REQUIRED?	VFR FLIGHT NOT PERMITTED	YES	YES	NO	NO	

250 KIAS

Not applicable to military aircraft

* Aircraft (including helicopters) may fly at or below 3000FT AMSL, or 1000FT above terrain, whichever is the higher, during day only, at 140KIAS or less, clear of cloud with the surface in sight and a flight visibility of at least 1500metres.

† Aircraft may fly at or below 3000FT AMSL, or 1000ft above terrain, whichever is the higher, during day only, at 140KIAS or less, clear of cloud with the surface in sight and; for aircraft other than helicopters, with a flight visibility of at least 5KM; for helicopters, with a flight visibility of at least 1500metres.

‡ SVFR in CTR only.



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- 17.6.1.10 ATS routes are airways along which aircraft fly, navigating via ground-based electronic aids, or, increasingly, Global Navigation Satellite System waypoints. ATS routes are used where high levels of traffic move between areas. They may be standalone sections or embedded, either wholly or in part, within a segment of airspace.
- 17.6.1.11 The nearest ATS route to the Array Area is Y906, located approximately 36 km southwest. There are no upper ATS routes within the Class C airspace above the Array Area, which is designated as Free Route Airspace between FL 255 and FL 660 (approximately 25,500 ft and 66,000 ft AMSL respectively).
- 17.6.1.12 The nearest civil airport to the Array Area is Stornoway/*Steòrnabhagh* Airport located 29.6 km to the southeast. Stornoway/*Steòrnabhagh* Airport has established IFPs which lie coincidental with the Array Area. An IFP assessment (**Appendix 17.2, Volume 2c**) has been undertaken to determine impacts to Stornoway/*Steòrnabhagh* Airport.
- 17.6.1.13 The nearest SSR to the Array Area is the NATS en route facility Sandwick SSR, located 29.2 km to the southeast. CAP 670 states that impacts to SSR caused by WTGs are typically only a consideration when they are located within 10 km. To protect their SSR, NATS has established a safeguarded zone of 28 km around their facilities. The Array Area is located outside of this zone. In their scoping response (MD-LOT, 2024), NATS did not raise any concerns regarding SSRs.
- 17.6.1.14 The closest NATS PSR is Tiree/*Tiriodh*, located 208 km to the south of the Array Area. RLoS analysis conducted within **Appendix 17.1, Volume 2c** determined that Tiree/*Tiriodh* would not have RLoS of WTGs with a maximum tip height of 338.4 m AMSL. NATS did not raise any concerns regarding their PSR systems within their scoping response (MD-LOT, 2024).
- 17.6.1.15 The nearest NATS AGA communication facility, Forsnaval is located 14.3 km to the southwest of the Array Area. To protect their AGA facilities, NATS have established a 10 km safeguarded zone around these facilities. Although the Array Area is located outside of this zone, NATS stated within their scoping response that theoretical modelling indicated WTGs (with a tip height of 380 m AMSL) within the Array Area may cause signal interference within the vicinity of the Array Area. NATS have since been consulted (via e-mail June 2025) in which NATS stated they would complete a safeguarding assessment using the reduced WTG tip heights (338.4 m AMSL) and positions.

Military Aviation

- 17.6.1.16 The nearest military airspace to the Array Area is the Hebrides Danger Area EGD701F, located 10.1 km to the west. This airspace is not permanently active but is activated on request. This airspace has unlimited vertical limits extending from sea level. Activities within this danger area include target towing, unmanned aircraft systems, (Visual Line of Sight/Beyond Visual Line of Sight), high energy manoeuvres, ordnance, munitions and explosives, paradropping, balloons, electronic, and optical hazards. This airspace accommodates the Hebrides Missile Range. Within their scoping response (MD-LOT, 2024), the MOD stated that the range operator, QinetiQ,

confirmed they have no concerns regarding the Offshore Project. This airspace is not considered further.

- 17.6.1.17 Located to the northeast of the Array Area is the Northern Danger Area Complex, 1 of 4 danger area complexes in UK airspace that provide segregated airspace for military training. These areas of airspace are not permanently active but are activated on request. When activated, the nearest airspace within this complex, EGD712A, is active from FL 245 to FL 660 (approximately 24,500 ft to 66,000 ft AMSL respectively). Activities within this danger area include high energy manoeuvres. This airspace is not considered further.
- 17.6.1.18 The UK is divided into 20 separate LFAs. Low flying occurs in most parts of the UK at any height up to 2,000 ft above the surface. This activity is mostly concentrated between 250 ft and 500 ft. The entirety of the Array Area is located within LFA 14. The DIO must be consulted in all cases where a proposed wind development may affect military operations.
- 17.6.1.19 Low flying training may be undertaken at night. Most night-time flying by MOD aircraft is undertaken by crews equipped with Night Vision Goggles, therefore Infrared lights that meet MOD requirements will be necessary for windfarms within Night-Time LFAs. The Array Area is located within the Night-Time LFA 1BW. The MOD have stated in their scoping response (MD-LOT, 2024) that the Offshore Project will be required to be fitted with MOD accredited aviation safety lighting in accordance with the CAA, Air Navigation Order 2016.
- 17.6.1.20 The nearest PSR equipped military airfield to the Array Area is RAF Lossiemouth, located approximately 207 km to the east southeast. RLoS analysis conducted within **Appendix 17.1, Volume 2c** indicates that WTGs with a maximum tip height of 338.4 m will not be within RLoS to RAF Lossiemouth. The MOD confirmed that the Array Area is located outside the range of RAF Lossiemouth.
- 17.6.1.21 The nearest military ADR to the Array Area is RRH Benbecula/*Beinn nam Fadhla*, located 85.5 km to the south southwest. RLoS analysis conducted within **Appendix 17.1, Volume 2c** indicates that WTGs with a maximum tip height of 338.4 m - within the southwest corner of the Array Area will be within RLoS to RRH Benbecula/*Beinn nam Fadhla*.

Offshore Helideck

- 17.6.1.22 To help achieve a safe operating environment, CAP 764 establishes a 9 nm consultation zone for planned obstacles around offshore helicopter destinations. Within 9 nm, obstacles such as WTGs can potentially impact upon the feasibility of helicopters to safely fly during low visibility or missed approach procedures at their associated helideck site. The nearest active offshore helideck to the Array Area is the Captain WPPA, located 282 km to the east, far from the established 9 nm (16.7 km) consultation zone.

Search and Rescue

- 17.6.1.23 SAR operations are a highly specialised undertaking involving not only aviation assets, but also small boats, ships, and shore-based personnel. SAR operations are generally carried out in extremely challenging conditions and at all times of the day and night. There are 10 helicopter SAR bases around the UK with Bristow Group providing helicopters and aircrew on behalf of the MCA.
- 17.6.1.24 The nearest SAR base is at Stornoway/*Steòrnabhagh* Airport, located 29.6 km to the southeast of the Array Area. Its helicopters provide rescue services for both offshore and land-based incidents. The random nature of people, watercraft or aircraft in distress make it difficult to determine the routes taken by SAR aircraft.
- 17.6.1.25 The MCA sets out its requirements for windfarms with regards to SAR in MGN 654 Annex 5 – Offshore Renewable Energy Installations: Requirements, guidance and operational considerations for SAR and Emergency Response.

Weather Radars

- 17.6.1.26 The nearest Met Office weather radar to the Array Area is Druim A'Starraig located 35.5 km to the southeast.
- 17.6.1.27 RLoS analysis conducted within **Appendix 17.1, Volume 2c** indicates that Druim A'Starraig would have RLoS of WTGs with a maximum tip height of 338.4 m AMSL and 293.8 m AMSL.
- 17.6.1.28 During post-scoping consultation, the Met Office stated that the lowest elevation scan of Druim A'Starraig was 0.5° and that if the WTGs were not within RLoS of the next elevation scan of 1°, then this impact may be acceptable.
- 17.6.1.29 RLoS analysis conducted within **Appendix 17.1, Volume 2c** indicates that WTGs with a maximum tip height of 338.4 m AMSL will not be within RLoS to Druim A'Starraig at an elevation scan of 1°.
- 17.6.1.30 Campar Mor is a proposed weather radar site which may replace the current Druim A'Starraig radar. The proposed radar is located 22 km to the east of the Array Area.
- 17.6.1.31 RLoS analysis conducted within **Appendix 17.1, Volume 2c** indicates that WTGs with a maximum tip height of 338.4 m AMSL will not be within RLoS to Campar Mor at an elevation scan of 1°.
- 17.6.1.32 These results were presented to the Met Office in which they agreed with the modelling outcome and confirmed that impacts to the radars can be managed.

17.6.2 FUTURE BASELINE

- 17.6.2.1 The baseline environment is not static and may exhibit some degree of change over time, with or without the Offshore Project in place. Therefore, when undertaking impact assessments, it is necessary to place any potential effects in the context of the envelope of change that might occur naturally in the absence of the Offshore Project.

- 17.6.2.2 Although the aviation industry is under long-term pressure to reduce its contribution to climate change, this is not considered to have significant implications for the aviation and radar baseline parameters discussed above.
- 17.6.2.3 As outlined in paragraph 17.6.1.30, the Met Office may replace the weather radar at Druim A'Starraig with a weather radar at a new proposed radar site, Campar Mor. The proposed weather radar would be installed to mitigate the impact of the onshore Stornoway/Steòrnabhagh Wind Farm on Druim A'Starraig weather radar. The potential impact on both Campar Mor and Druim A'Starraig is assessed within Section 17.9.

17.7 BASIS FOR ENVIRONMENTAL IMPACT ASSESSMENT

17.7.1 MAXIMUM DESIGN SCENARIO

- 17.7.1.1 Assessing using a parameter-based design envelope approach means that the assessment considers a maximum design scenario whilst allowing the flexibility to make improvements in the future in ways that cannot be predicted at the time of submission of the consent applications. The assessment of the maximum adverse scenario for each receptor establishes the maximum potential adverse impact and, as a result, effects of greater adverse significance would not arise should any other development scenario (as described in **Chapter 3, Volume 1a**) to that assessed within this Chapter be taken forward in the final scheme design.
- 17.7.1.2 The maximum parameters and assessment assumptions that have been identified to be relevant to Military and Civil Aviation are outlined in **Table 17-11** and are in line with **Chapter 3, Volume 1a**.
- 17.7.1.3 Although pre-construction surveys may involve some limited and temporary interactions with the marine environment, the potential impacts of any such activities fall well within the MDS parameters assessed for this chapter. The MDS includes activities such as WTG foundation drilling and grouting, and Offshore Cable installation which represent a conservative upper bound on seabed disturbance, and vessel presence. These MDS activities therefore encompass the environmental footprint of pre-construction survey methods, which are significantly lower in magnitude, duration, and spatial extent.
- 17.7.1.4 For this reason, the potential environmental interactions of pre-construction surveys are not separately assessed, as they are already inherently accommodated within the worst case assumptions underpinning the MDS for this topic.
- 17.7.1.5 The difference in timing between pre-construction surveys and construction activities does not affect the assessment because the MDS represents the maximum magnitude of change, independent of phasing or scheduling. The pre-construction surveys occur over a much shorter duration and at materially lower intensities than the MDS bounding activities, and therefore do not introduce any temporal additive effects beyond those already assessed.

Table 17-11: Maximum parameters and assessment assumptions for impacts on Military and Civil Aviation

Project phase and activity/impact	Maximum Design Scenario	Justification
Construction		
Creation of an aviation obstacle environment for airborne receptors.	<p>Offshore infrastructure Full build out of Scenario 1, consisting of WTGs and an OSP: <u>WTG specifications</u> WTG blade tip heights: between 293.8 m AMSL and 338.4 m AMSL <u>OSP specifications</u> - Up to 1 OSP to be installed within the Turbine Area - Maximum height of main structure and helideck at 90 m AMSL - Maximum height of lightning protection and ancillary structures at 110 AMSL</p> <p>Construction working arrangements - The installation of WTGs/OSP within the Turbine Area will involve multi leg Jack Up Vessel (JUV) with a mounted crane.</p> <p>Construction Programme - Duration up to 5 years - Working hours are expected to be 24 hours, 7 days a week - Offshore construction within the Offshore Project Boundary will only be undertaken during the April-October period, except for offshore Landfall construction works located within the Horizontal Directional Drill (HDD) Exit Pit Area.</p>	<p>The final scenario is likely to be WTGs with tip heights between 293.8 m and 338.4 m AMSL. The assessment of impacts is robust for any combination of WTG parameters within these ranges.</p> <p>The maximum height of WTGs exceeds that of any other structure included within the Offshore Project infrastructure including an OSP (located within the Turbine Area). This also includes any tall cranes and vessels involved in the construction phase. Therefore, the maximum WTG tip height represents the worst-case impact to military and civil receptors including IFPs at Stornoway/Steòrnabhagh Airport.</p> <p>Impact starting from a point of zero infrastructure present to full presence over 5-year period.</p>
Increased air traffic in the area related to wind farm activities affecting the available airspace for other users.	<p>Helicopter movements - Up to 1 helicopter on site - Up to 50 movements (return trips) per year</p> <p>Construction programme - Duration up to 5 years - Working hours are expected to be 24 hours, 7 days a week. - Offshore construction within the Offshore Project Boundary will only be undertaken during the April-October period, except for offshore Landfall construction works located within the HDD Exit Pit Area.</p>	<p>Helicopter trips as a result of being engaged in works on the Offshore Project causing increased likelihood of aircraft-to-aircraft collision.</p> <p>Impact present throughout the maximum duration of the construction phase.</p>
Operation and Maintenance		
Creation of an aviation obstacle environment for airborne receptors.	<p>Offshore infrastructure Full build out of Scenario 1, consisting of WTGs and an OSP <u>WTG specifications</u> WTG blade tip heights: between 293.8 m AMSL and 338.4 m AMSL. <u>OSP specifications</u> - Up to 1 OSP to be installed within the Turbine Area - Maximum height of main structure and helideck at 90 m AMSL - Maximum height of lightning protection and ancillary structures at 110 AMSL</p> <p>Operational and maintenance programme - Duration up to 35 years</p>	<p>The final scenario is likely to be WTGs with tip heights between 293.8 m and 338.4 m AMSL. The assessment of impacts is robust for any combination of WTG parameters within these ranges.</p> <p>The maximum height of WTGs exceeds that of any other structure included within the Offshore Project infrastructure including an OSP (located within the Turbine Area). Therefore, the maximum WTG tip height represents the worst-case impact to military and civil receptors including IFPs at Stornoway/Steòrnabhagh Airport.</p> <p>Impact present for operational lifetime of up to 35 years.</p>
Increased air traffic in the area related to wind farm activities affecting	<p>Helicopter movements - Up to 1 helicopter on site - Up to 70 movements (return trips) per year</p>	<p>Helicopter trips as a result of being engaged in works on the Offshore Project causing increased likelihood of aircraft-to-aircraft collision.</p>

Project phase and activity/impact	Maximum Design Scenario	Justification
the available airspace for other users.	Operational and maintenance programme - Duration up to 35 years	Maximum impact over operational lifetime of 35 years.
WTGs causing interference on military and civil aviation radars.	The MDS used for this assessment is identical to the MDS for the Offshore Project O&M phase ' <i>Creation of an aviation obstacle environment for airborne receptors</i> ' pathway above.	<p>The final scenario is likely to be WTGs with tip heights between 293.8 m and 338.4 m AMSL. The assessment of impacts is robust for any combination of WTG parameters within these ranges.</p> <p>Maximum number of the tallest WTGs, or maximum total number of WTGs for the Offshore Project (either of the scenarios could be worst case and both have been assessed).</p> <p>The maximum WTG tip height is used within RLoS analysis. The taller the WTGs, the higher chance of detection by PSR systems.</p> <p>Impact present for operational lifetime of up to 35 years.</p>
Impact on VHF/UHF radio communication systems.	The MDS used for this assessment is identical to the MDS for the Offshore Project O&M phase ' <i>Creation of an aviation obstacle environment for airborne receptors</i> ' pathway above.	<p>The final scenario is likely to be WTGs with tip heights between 293.8 m and 338.4 m AMSL. The assessment of impacts is robust for any combination of WTG parameters within these ranges.</p> <p>Maximum number of the tallest WTGs, or maximum total number of WTGs for the Offshore Project (either of the scenarios could be worst case and both have been assessed).</p> <p>WTGs have the potential to impact ATS where their size, quantity and locations results in VHF/UHF Radio/Telephony (R/T) with unacceptable levels of interference. This is caused by multipath interference from static elements, and signal modulation effects generated by rotating WTGs.</p> <p>Impact present for operational lifetime of 35 years.</p>
Decommissioning		
Creation of an aviation obstacle environment.	The MDS used for this assessment is identical to the MDS for the Offshore Project O&M phase ' <i>Creation of an aviation obstacle environment for airborne receptors</i> ' pathway above. Decommissioning programme - Duration is up to 5 years - Working hours are expected to be 24 hours, 7 days a week.	<p>The final scenario is likely to be WTGs with tip heights between 293.8 m and 338.4 m AMSL. The assessment of impacts is robust for any combination of WTG parameters within these ranges.</p> <p>Maximum number of the tallest WTGs, or maximum total number of WTGs for the Offshore Project (either of the scenarios could be worst case and both have been assessed).</p> <p>The maximum height of WTGs exceeds that of any other structure included within the Offshore Project infrastructure including an OSP (located within the Turbine Area). This also includes any tall cranes and vessels involved in the decommissioning. Therefore, the maximum WTG tip height represents the worst-case impact to military and civil receptors.</p> <p>Impact starting from a point of full presence of infrastructure to zero presence over the decommissioning period.</p>
Increased air traffic in the area related to wind farm activities affecting the available airspace for other users.	Helicopter movements - Up to 1 helicopter on site - Up to 50 movements (return trips) per year Decommissioning programme - Duration is up to 5 years. - Working hours are expected to be 24 hours, 7 days a week.	<p>Helicopter trips as a result of being engaged in works on the Offshore Project causing increased likelihood of aircraft-to-aircraft collision.</p> <p>Impact present throughout the maximum duration of the decommissioning phase.</p>

17.7.2 EMBEDDED MITIGATION MEASURES

- 17.7.2.1 As part of the Offshore Project design process, a number of embedded mitigation measures have been adopted to reduce the potential for impacts on military and civil aviation and these have evolved over the development process as the EIAR has progressed and in response to consultation.
- 17.7.2.2 The embedded mitigation measures also include those that have been identified as good or standard practice and include actions that would be undertaken to meet existing legislation requirements. As there is a commitment to implementing the embedded mitigation, and also to various standard sectoral practices and procedures, they are considered inherently part of the design of the Offshore Project and are set out in this EIAR.
- 17.7.2.3 **Table 17-12** sets out the relevant embedded mitigation measures within the design and how these affect the Military and Civil Aviation assessment.

Information, Notifications and Charting

- 17.7.2.4 The Array Area will create an obstacle environment which can effectively be mitigated by compliance with appropriate international and national requirements for the publication of the obstacle locations on charts and in aeronautical documentation, together with the permanent marking and lighting of obstacles.
- 17.7.2.5 Measures will be adopted at the commencement of works on the Offshore Project to ensure that the aviation sector is made aware of the creation of a further aviation obstacle in the Scottish waters. These measures will include issuing Notices to Aviation (NOTAMs) and Aeronautical Information Circulars (AICs), warning of the establishment of obstacles within the Offshore Project Boundary.
- 17.7.2.6 At various points during the development details of the position, height, and lighting of each of the completed permanent structures will be forwarded to the CAA Aeronautical Information Service (AIS) for inclusion in the AIP and on relevant aeronautical charts, as notifiable permanent obstructions. This permanent information will replace the short-term NOTAMs that will continue to be issued to cover the Offshore Project until construction has been completed.
- 17.7.2.7 En route navigation charts will be updated as the site construction proceeds. All obstacles over 300 ft AMSL must be notified to the CAA for inclusion in the UK AIP (section ENR5.4) and on aeronautical maps and to Defence Geographic Centre for inclusion in MoD databases.

Marking and Lighting

- 17.7.2.8 The international marking and lighting requirement, set out in ICAO Annex 14, specifies that:
- “a wind turbine shall be marked and/or lighted if it is determined to be an obstacle.”;*

“the rotor blades, nacelle and upper 2/3 of the supporting mast of wind turbines should be painted white, unless otherwise indicated by an aeronautical study.”

- 17.7.2.9 UK regulations adopt ICAO Annex 14's requirements as to lighting of WTGs but do not require that WTGs follow the ICAO recommendation as to paint colour. CAP 764 sets out the CAA Policy on the marking of offshore wind turbines. It specifies in the UK, the rotor blades, nacelle and upper 2/3 of the supporting mast of wind farms (which are deemed an aviation obstacle) should be painted white or grey. The CAA will accept a white colour, RAL 9010 or an equivalent, through to light grey, RAL 7035, which is the darkest acceptable off-white colour allowed. Shades between the 2 RAL specifications will also be accepted. In terms of marking the WTGs, in keeping with recent practice for offshore wind farms, it is anticipated that Trinity House, a charity dedicated to the safeguarding of shipping and seafarers, will require all structures to be painted yellow from the level of MHSW to a height directed by Trinity House, and above the yellow section, all WTGs will be painted submarine grey (colour code RAL 7035).
- 17.7.2.10 The Offshore Project will be lit in accordance with the ANO. ANO Article 222 defines an 'en route obstacle' requiring lighting as:
- Any building, structure, or erection;
 - The height of which is 150 m or more AGL.
- 17.7.2.11 Article 223 modifies the Article 222 requirement with respect to offshore WTGs, requiring:
- WTGs to be lit where they exceed 60 m above HAT;
 - With a medium intensity (2,000 candela (cd)) steady red light mounted on the top of each nacelle;
 - With limited downward spillage of light.
- 17.7.2.12 Article 223 allows for the CAA to permit that not all WTGs are so lit. The CAA will require that all WTGs on the periphery of any wind farm need to be equipped with aviation warning lighting and such lighting, where achievable, shall be spaced at longitudinal intervals not exceeding 900 m. There is no current routine requirement for offshore obstacles to be fitted with intermediate vertically spaced aviation lighting.
- 17.7.2.13 CAA guidance has been subject to coordination with maritime agencies to avoid confusion with maritime lighting. To that end, the CAA has indicated that the use of a flashing red Morse Code letter 'W' is likely to be approved to resolve potential issues for the maritime community.
- 17.7.2.14 The MCA is seeking that WTG blade tips are marked in red, together with markings down the blade, to provide a SAR helicopter pilot with a hover reference point as set out in the OREI SAR Requirements document. The MCA also seeks a lighting scheme comprising 200 cd red/infra-red lights on the nacelles of non-Article 223 WTGs, to be operated on demand during SAR operations and a WTG shutdown protocol to be applied during rescue situations. These measures will be undertaken and an Emergency Response and Cooperation Plan (ERCOP) will be developed and

implemented for all phases of the Offshore Project, based upon the MCA's standard template. Appropriate lighting will be utilised to facilitate heli-hoisting if undertaken within the Offshore Project Boundary, as outlined in CAP 437.

- 17.7.2.15 To satisfy MOD requirements, the WTGs will also be required to be fitted with infra-red lighting in combination with the ANO Article 223 lights. MOD lighting guidance indicates that operational requirements are satisfied provided combination infra-red/2,000 cd visible red lights are used to light the WTGs required to be lit under ANO Article 223.

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Table 17-12: Relevant Military and Civil Aviation embedded mitigation measures.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to Military and Civil Aviation
M010	Compliance with MGN 654 and its annexes including development and implementation of a SAR Checklist, ERCOP and guard vessels as required by risk assessment.	Pre-Construction, construction, operation (including maintenance), and decommissioning	Secured in the Section 36 Consent and/or Marine Licence conditions. Details will be provided within the ERCOP.	The Offshore Project will create an obstacle environment that may impact SAR helicopter flight operations should SAR be required within or close to the Offshore Project. The preparation of an ERCOP in cooperation with the MCA will mitigate the impact.
M017	Information regarding construction to be provided to the CAA in accordance with ANO Article 225A at least 8 weeks in advance of the erection or removal of the en route obstacle (whether an anemometer mast, turbine or installation crane/vessel, etc). Data to include location, height (of all structures over 100 m), date of erection, date of removal and lighting type; changes to the planned works must also be notified to the CAA in accordance with ANO Article 225A. The CAA coordinates dispersion of the information to NATS and the MOD for inclusion as required in the UK AIP and the UK Military AIP.	Construction, Operation and Maintenance	To be secured through a condition of the Section 36 consent and Marine Licence.	The Offshore Project will create an aviation obstacle environment that can be mitigated by warning the aviation sector through the issue of NOTAMs and AICs. Permanent information on the Offshore Project will be provided to the CAA under ANO Article 225A for inclusion by NATS in the UK AIP and Defence Geographic Centre for inclusion in the Military AIP, and on relevant civil and military aeronautical charts.
M019	A final Offshore Environmental Management Plan (OEMP) will be developed prior to commencement of construction (building on Outline Offshore	Construction, Operation and Maintenance	Secured in the Section 36 Consent and/or Marine Licence via the	An OEMP will be developed with compliance to relevant aviation related legislation and standards.

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to Military and Civil Aviation
	<p>Environmental Management Plan, Volume 3) in compliance with legislative requirements and/or best practice standards and guidance and adhered to.</p>		<p>condition for an OEMP to be submitted to MD-LOT for approval.</p>	
M033	<p>A LMP will be developed prior to commencement of construction (building on the Outline Lighting and Marking Plan, Volume 3) in compliance with legislative requirements and best practice standards and guidance and adhered to.</p>	<p>Pre-Construction, Construction, Operation and Maintenance and Decommissioning</p>	<p>Secured in the Section 36 Consent and/or Marine Licence conditions via the condition for a LMP to be submitted to MD-LOT for approval.</p>	<p>To mitigate the impact of WTGs as aviation obstacles and make them more visible to pilots, WTGs must be suitably marked and lit. Requirements for the lighting of offshore WTGs are detailed in Article 222 and 223 of the ANO and supplemented by additional MOD guidance and MGN 654 Annex 5 requirements.</p>
M039	<p>Lighting and marking failures will be appropriately reported and rectified as soon as possible. Interim hazard warnings will be put in place.</p>	<p>Construction, Operation and Maintenance and Decommissioning</p>	<p>To be secured through a condition of the Section 36 consent and Marine Licence.</p>	<p>Ensures that all aviation stakeholders are aware of the lighting or marking failure, and that the issue is resolved</p>
M055	<p>Development of, and adherence to a Development Specification and Layout Plan (DSLPL) which will be shared with Military and Civil Aviation stakeholders.</p>	<p>Pre-construction</p>	<p>To be secured through a condition of the Section 36 consent and/or Marine Licence.</p>	<p>Ensures that all aviation stakeholders are aware of the potential aviation obstacle environment</p>

17.8 ASSESSMENT OF EFFECTS: CONSTRUCTION PHASE

17.8.1 CREATION OF AN AVIATION OBSTACLE ENVIRONMENT

17.8.1.1 Construction of the Offshore Project will involve tall crane vessels and the installation of infrastructure above sea level may pose a physical obstruction to low flying aircraft, increasing the risk of collision or requiring aircraft to fly extended routes to avoid obstacles. The construction phase of the Offshore Project will begin from a starting point of no infrastructure within the Array Area, to WTGs with a tip height between 293.8 m AMSL and 338.4 m AMSL, and 1 OSP by the end of the construction phase. The assessment of impacts is robust for any combination of WTG parameters within these ranges as it assumes the maximum tip height of 338.4 m AMSL, superseding any impact caused by lower tip heights.

17.8.1.2 Specifically, permanent or temporary obstacles may increase collision risk for:

- Military low flying activity;
- Aircraft flying Stornoway Airport IFPs;
- Commercial helicopter operations;
- Helicopters involved in SAR operations.

17.8.1.3 The maximum design scenario relating to Military and Civil Aviation during the construction phase are presented in **Table 17-11**.

17.8.1.4 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

Military Low Flying Activity

17.8.1.5 As detailed in **Table 17-12**, potential impacts on low flying activities in the vicinity of the Array Area will be mitigated through the development of a LMP (outlined in embedded mitigation measure M033) in agreement with key aviation stakeholders, and through the provision of the positions and heights of structures to the CAA in accordance with embedded mitigation measure M017 to enable appropriate marking on civil and military AIPs and aeronautical charts.

17.8.1.6 Embedded mitigation (M017 and M033) in the form of compliance with international and national Standards and Recommended Practices (SARPs) with respect to notification, charting, marking and lighting is listed in **Table 17-12**. This would make pilots aware of the infrastructure within the Array Area, and it is assumed that pilots will comply with aviation regulatory requirements and use the principle of 'see and avoid'. Under Standardised European Rules of the Air (SERA) Section 5005, pilots must maintain a minimum separation distance of 150 m (500 ft) above the highest obstacle within a radius of 150 m (500 ft) from the aircraft.

Magnitude of Impact

- 17.8.1.7 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.
- 17.8.1.8 The impact on military low flying activity is predicted to be of local spatial extent, short to medium term duration, intermittent, and low reversibility. It is predicted that the impact may affect the receptor directly. The magnitude of effect is therefore considered to be **Low**.

Sensitivity of Receptor

- 17.8.1.9 Military low flying activity has been deemed to be of low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

- 17.8.1.10 Considering the medium sensitivity of military low flying activity and the low magnitude of effect, the overall residual effect on military low flying activity, following the implementation of embedded mitigation measures, of an aviation obstacle environment during construction is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

- 17.8.1.11 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

Aircraft Flying Stornoway Airport Instrument Flight Procedures

- 17.8.1.12 WTGs and tall crane vessels within the Array Area could become a physical obstacle to flight operations at Stornoway/Steòrnabhagh Airport. The maximum height of WTGs exceeds that of any other structure included within the Offshore Project infrastructure including an OSP (located within the Turbine Area). This also includes any tall cranes and vessels involved in the construction phase. Therefore, the maximum WTG tip height represents the worst-case impact to military and civil receptors including IFPs at Stornoway/Steòrnabhagh Airport. WTGs infringing IFP protected surfaces will require IFPs to be redesigned with higher minimum safe altitudes which could result in an impact on Stornoway/Steòrnabhagh Airport operations due to the potential reduction in aircraft being able to land at the airport in poor weather.
- 17.8.1.13 The IFP assessment (**Appendix 17.2, Volume 2c**) has identified that potential impacts to the following Instrument Approach Procedures:
- Runway 18 Localiser (LOC)/Distance Measuring Equipment (DME)/Non-Directional Radio Beacon (NDB)(L) – Procedure Turn;
 - Runway 18 NDB(L)/DME – Procedure Turn;
 - Runway 18 NDB(L) – Procedure Turn and Extended Race Track (CAT C, D).

Magnitude of Impact

17.8.1.14 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

17.8.1.15 The impact to Stornoway/*Steòrnabhagh* Airport IFPs is predicted to be of regional spatial extent, short to medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Medium**.

Sensitivity of Receptor

17.8.1.16 Stornoway/*Steòrnabhagh* Airport IFPs are deemed to be high vulnerability, low recoverability and high value. The sensitivity of the receptor is therefore considered to be **High**.

Significance of Effect

17.8.1.17 The IFP assessment determined that the Offshore Project will impact Stornoway/*Steòrnabhagh* Airport IFPs. Taking the high sensitivity of Stornoway/*Steòrnabhagh* Airport IFPs and the medium magnitude of effect, the overall residual effect of the creation of an aviation obstacle environment is predicted to be **Moderate Adverse** and **Potentially Significant** in EIA terms.

Further environmental mitigation and residual effect

17.8.1.18 Given the potential Military and Civil Aviation impact is predicted to be significant in EIA terms for aircraft flying Stornoway IFPs, the following further environmental mitigation relevant to Military and Civil Aviation has been identified.

Table 17-13 Relevant Military and Civil Aviation further mitigation measures

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured
A008	Before Project construction commences, final details of WTG locations and blade tip heights will be confirmed with HIAL to enable suitable revisions to the relevant IFPs as outlined in Appendix 17.2: Instrument Flight Procedures, Volume 2c .	Pre-construction	Secured in the Section 36 Consent and/or Marine Licence via a consent condition.

17.8.1.19 Consultation has been undertaken with HIAL to inform of potential obstacle infringements of IFPs and operational effects at Stornoway/*Steòrnabhagh* Airport. HIAL stated acceptance of the proposed IFP changes in the IFP assessment (**Appendix 17.2, Volume 2c**) to mitigate impacts.

17.8.1.20 Providing further environmental mitigation measures are in place prior to the construction of WTGs, the magnitude of the impact will be reduced from medium to low. Therefore, the residual effect is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Offshore Helicopter Operations

17.8.1.21 As detailed in **Table 17-12**, potential impacts on any offshore helicopter operations in the vicinity of the Array Area will be mitigated through the development of a LMP (outlined in M033) in agreement with key aviation stakeholders and through the provision of the positions and heights of structures to the CAA in accordance with embedded mitigation measure M017 to enable appropriate inclusion in civil and military AIPs and marking on aeronautical charts.

17.8.1.22 Embedded mitigation (M017 and M033) in the form of compliance with international and national SARPs with respect to notification, charting, marking and lighting is listed in **Table 17-12**. This would make pilots aware of the infrastructure within the Array Area, and it is assumed that pilots will comply with aviation regulatory requirements and use the principle of 'see and avoid'. Under SERA Section 5005, pilots must maintain a minimum separation distance of 150 m (500 ft) above the highest obstacle within a radius of 150 m (500 ft) from the aircraft.

Magnitude of Impact

17.8.1.23 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

17.8.1.24 The impact on offshore helicopter operations is predicted to be of local spatial extent, short to medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Low**.

Sensitivity of Receptor

17.8.1.25 Offshore helicopter operations are deemed to be low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

17.8.1.26 Considering the medium sensitivity of offshore helicopter operations and the low magnitude of effect, the overall residual effect on sensitive receptors, following the implementation of embedded mitigation measures, of the creation of an aviation obstacle environment during construction is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

17.8.1.27 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

Search and Rescue Helicopters

- 17.8.1.28 As detailed in **Table 17-12**, potential impacts on offshore helicopter operations in the vicinity of the Array Area will be mitigated through the development of a LMP (outlined in M033) in agreement with key aviation stakeholders and through the provision of the positions and heights of structures to the CAA in accordance with embedded mitigation measure M017 to enable appropriate inclusion in civil and military AIPs and marking on aeronautical charts.
- 17.8.1.29 Embedded mitigation (M017 and M033) in the form of compliance with international and national SARPs with respect to notification, charting, marking and lighting is listed in **Table 17-12**. This would make pilots aware of the infrastructure within the Array Area, and it is assumed that pilots will comply with aviation regulatory requirements and use the principle of 'see and avoid'. Under SERA Section 5005, pilots must maintain a minimum separation distance of 150 m (500 ft) above the highest obstacle within a radius of 150 m (500 ft) from the aircraft.
- 17.8.1.30 Lighting of WTGs will meet MOD and SAR requirements, and the final WTG layout will be compatible with SAR helicopter operations. An ERCOP will be developed and implemented for all phases of the Offshore Project (outlined in embedded mitigation M010).

Magnitude of Impact

- 17.8.1.31 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.
- 17.8.1.32 The impact on SAR helicopters is predicted to be of local spatial extent (i.e. limited to the vicinity of the Array Area), medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Low**.

Sensitivity of Receptor

- 17.8.1.33 SAR helicopters are deemed to be of low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

- 17.8.1.34 Considering the medium sensitivity of SAR helicopter operations and the low magnitude of effect, the overall residual effect on sensitive receptors, following implementation of embedded mitigation measures, of the creation of an aviation obstacle environment during construction is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

- 17.8.1.35 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

17.8.2 INCREASED AIR TRAFFIC RELATED TO WIND FARM ACTIVITIES

- 17.8.2.1 The use of helicopters to support construction activities for the Offshore Project may impact on existing air traffic in the vicinity of the Array Area. 1 helicopter will be on site at any one time. The potential increase in air traffic associated with construction activities brings with it a potential increased possibility of aircraft collision in the airspace around the Array Area.
- 17.8.2.2 The predicted low number of helicopter movements during construction phase will be managed by the existing ATS infrastructure provided in accordance with national procedures, and pilots will be expected to operate in accordance with regulatory requirements.
- 17.8.2.3 The maximum design scenario relating to Military and Civil Aviation during the construction phase are presented in **Table 17-11**.
- 17.8.2.4 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

Magnitude of Impact

- 17.8.2.5 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.
- 17.8.2.6 The impact is predicted to be of local spatial extent (i.e. limited to the Military and Civil Aviation study area), short to medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be **Low**.

Sensitivity of Receptor

- 17.8.2.7 Helicopter support operations and existing air traffic are deemed to be of low vulnerability and high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

- 17.8.2.8 The magnitude of the effect is deemed to be low, and the sensitivity of the receptor is medium. This increase in air traffic related to wind farm activities during construction is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

- 17.8.2.9 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

17.9 ASSESSMENT OF EFFECTS: OPERATION AND MAINTENANCE

17.9.1 CREATION OF AN AVIATION OBSTACLE ENVIRONMENT

17.9.1.1 During the O&M phase, a maximum infrastructure of WTGs with a tip height between 293.8 m AMSL and 338.4 m AMSL, and 1 OSP will exist within the Array Area. This may pose a physical obstruction to aircraft utilising the airspace in the vicinity of the Array Area, potentially increasing the risk of obstacle collision or requiring aircraft to fly extended routes to avoid obstacles. The assessment of impacts is robust for any combination of WTG parameters within these ranges as it assumes the maximum tip height of 338.4 m AMSL, superseding any impact caused by lower tip heights.

17.9.1.2 Specifically, permanent obstacles may impact the following receptors:

- Military low flying activity;
- Commercial helicopter operations;
- Helicopters involved in SAR operations.

17.9.1.3 The maximum design scenario relating to Military and Civil Aviation during the construction phase are presented in **Table 17-11**.

17.9.1.4 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

Military Low Flying Activity

17.9.1.5 As detailed in **Table 17-12**, potential impacts on low flying activities in the vicinity of the Array Area will be mitigated through the development of a LMP (outlined in M033) in agreement with key aviation stakeholders, and through the provision of the positions and heights of structures to the CAA in accordance with embedded mitigation measure M017 to enable appropriate inclusion in civil and military AIPs and marking on aeronautical charts.

17.9.1.6 Embedded mitigation (M017 and M033) in the form of compliance with international and national SARPs with respect to notification, charting, marking and lighting is listed in **Table 17-12**. This would make pilots aware of the infrastructure within the Array Area, and it is assumed that pilots will comply with aviation regulatory requirements and use the principle of 'see and avoid'. Under SERA Section 5005, pilots must maintain a minimum separation distance of 150 m (500 ft) above the highest obstacle within a radius of 150 m (500 ft) from the aircraft.

Magnitude of Impact

17.9.1.7 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

17.9.1.8 The impact on military low flying activity is predicted to be of local spatial extent, medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Low**.

Sensitivity of Receptor

17.9.1.9 Military low flying activity is deemed to be of low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

17.9.1.10 Considering the medium sensitivity of low flying activity and the low magnitude of effect, the overall residual effect on sensitive receptors, following the implementation of embedded mitigation measures, of an aviation obstacle environment during O&M is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

17.9.1.11 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

Offshore Helicopter Operations

17.9.1.12 As detailed in **Table 17-12**, potential impacts on any offshore helicopter operations in the vicinity of the Array Area will be mitigated through the development of a LMP (outlined in M033) in agreement with key aviation stakeholders and through the provision of the positions and heights of structures to the CAA in accordance with embedded mitigation measure M017 to enable appropriate inclusion in civil and military AIPs and marking on aeronautical charts.

17.9.1.13 Embedded mitigation (M017 and M033) in the form of compliance with international and national SARPs with respect to notification, charting, marking and lighting is listed in **Table 17-12**. This would make pilots aware of the infrastructure within the Array Area, and it is assumed that pilots will comply with aviation regulatory requirements and use the principle of 'see and avoid'. Under SERA Section 5005, pilots must maintain a minimum separation distance of 150 m (500 ft) above the highest obstacle within a radius of 150 m (500 ft) from the aircraft.

Magnitude of Impact

17.9.1.14 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

17.9.1.15 The impact on offshore helicopter operations is predicted to be of local spatial extent, medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Low**.

Sensitivity of Receptor

17.9.1.16 Offshore helicopter operations are deemed to be low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

17.9.1.17 Considering the medium sensitivity of offshore helicopter operations and the low magnitude of effect, the overall residual effect on sensitive receptors, following the implementation of embedded mitigation measures, of the creation of an aviation obstacle environment during O&M is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

17.9.1.18 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

Search and Rescue Helicopters

17.9.1.19 As detailed in **Table 17-12**, potential impacts on offshore helicopter operations in the vicinity of the Array Area will be mitigated through the development of a LMP (outlined in M033) in agreement with key aviation stakeholders and through the provision of the positions and heights of structures to the CAA in accordance with embedded mitigation measure M017 to enable appropriate inclusion in civil and military AIPs and marking on aeronautical charts.

17.9.1.20 Embedded mitigation (M017 and M033) in the form of compliance with international and national SARPs with respect to notification, charting, marking and lighting is listed in **Table 17-12**. This would make pilots aware of the infrastructure within the Array Area.

17.9.1.21 Lighting of WTGs will meet MOD and SAR requirements, and the final WTG layout will be compatible with SAR helicopter operations. An ERCOP will be developed and implemented for all phases of the Offshore Project (outlined in M010).

Magnitude of Impact

17.9.1.22 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

17.9.1.23 The impact on SAR helicopters is predicted to be of local spatial extent (i.e. limited to the vicinity of the Array Area), medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Low**.

Sensitivity of Receptor

17.9.1.24 SAR helicopters are deemed to be of low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

- 17.9.1.25 Considering the medium sensitivity of SAR helicopter operations and the low magnitude of effect, the overall residual effect on sensitive receptors, following the implementation of embedded mitigation measures, of the creation of an aviation obstacle environment during O&M is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

- 17.9.1.26 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

17.9.2 INCREASED AIR TRAFFIC IN RELATION TO WIND FARM ACTIVITIES

- 17.9.2.1 The O&M phase will likely see an increase in helicopter traffic above the current baseline level engaged in works on the Offshore Project. 1 helicopter will be providing support for O&M activities during the O&M phase meaning 1 helicopter will be on site at any one time. The potential increase in air traffic associated with O&M activities brings with it a potential increased possibility of aircraft collision in the airspace around the Array Area.
- 17.9.2.2 The predicted low number of helicopter movements during the O&M phase will be managed by the existing ATS infrastructure provided in accordance with national procedures, and pilots will be expected to operate in accordance with regulatory requirements.
- 17.9.2.3 The maximum design scenario relating to Military and Civil Aviation during the construction phase are presented in **Table 17-11**.
- 17.9.2.4 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

Magnitude of Impact

- 17.9.2.5 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.
- 17.9.2.6 The impact is predicted to be of local spatial extent (i.e. limited to the military and civil aviation study area), medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Low**.

Sensitivity of Receptor

- 17.9.2.7 Helicopter support operations and existing air traffic are deemed to be of low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

- 17.9.2.8 The magnitude of the effect is deemed to be low, and the sensitivity of the receptor is medium. The residual effect resulting from this increase in air traffic related to wind farm activities during O&M is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

- 17.9.2.9 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

17.9.3 IMPACT TO MILITARY RADARS

Benbecula/Beinn nam Fadhla Air Defence Radar

- 17.9.3.1 During the O&M phase, infrastructure within the Array Area will consist of WTGs with a tip height between 289.8 m and 338.4 m AMSL, and 1 OSP. The Array Area will be within operational range of military and AD radar. In their scoping response, the MOD highlighted the WTGs potential to impact RRH Benbecula/Beinn nam Fadhla. RLoS modelling within **Appendix 17.1, Volume 2c** indicates that up to 15.04 km² of the Turbine Area will be within RLoS of RRH Benbecula/Beinn nam Fadhla with a maximum tip height of 338.4 m AMSL. WTGs within these areas will be theoretically detectable by the military AD radar, RRH Benbecula/Beinn nam Fadhla.
- 17.9.3.2 When operational (blades are fitted and rotating), WTGs have the potential to generate 'clutter' (or false targets) upon radar displays because current generation PSRs cannot easily differentiate between the moving blades of WTGs and aircraft. As a consequence, radar operators may be unable to distinguish between primary radar returns generated by WTGs and those generated by aircraft. This may compromise the ability of the MOD to undertake its AD role by using the impacted RRH Benbecula/Beinn nam Fadhla.

Magnitude of Impact

- 17.9.3.3 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.
- 17.9.3.4 RLoS modelling within **Appendix 17.1, Volume 2c** indicates that an area of up to 15.04 km² of the Turbine Area will be within RLoS of RRH Benbecula/Beinn nam Fadhla.
- 17.9.3.5 The impact is predicted to be of regional spatial extent, long term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **High**.

Sensitivity of Receptor

17.9.3.6 PSRs are deemed to be of high vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **High**.

Significance of Effect

17.9.3.7 The sensitivity of the receptor is high. In absence of mitigation measures, the magnitude of the impact is high. This residual effect would therefore be considered to be **Major Adverse and Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

17.9.3.8 Given the potential Military and Civil Aviation impact is predicted to be significant in EIA terms for Benbecula/Beinn nam Fadhla Air Defence Radar, the following further environmental mitigation relevant to Military and Civil Aviation has been identified.

Table 17-14 Relevant Military and Civil Aviation further mitigation measures

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured
A009	Before Project construction commences, final details of WTG locations and blade tip heights will be shared with the MOD to confirm that the potential impact to RRH Benbecula/ <i>Beinn nam Fadhla</i> is deemed acceptable.	Pre-construction	Secured in the Section 36 Consent and/or Marine Licence via a consent condition.

17.9.3.9 An Air Defence and Offshore Wind (AD&OW) Windfarm Mitigation Task Force was formed as a collaborative initiative between the MOD, what was the Department for Business, Energy and Industrial Strategy now the Department for Energy Security and Net Zero (DESNZ), the Offshore Wind Industry Council and The Crown Estate in August 2019. The aim of the Task Force is to enable the co-existence of UK AD and offshore wind by identifying potential mitigations and supporting processes, allowing offshore wind to contribute towards meeting the UK Government’s Net Zero target without degrading the nation’s AD surveillance capability.

17.9.3.10 The AD&OW Strategy and Implementation Plan (S&IP) was published in September 2021, setting out the direction for this collaboration by identifying, assessing and deploying solutions that will enable the co-existence of AD&OW operations such that neither are unduly nor excessively compromised. The S&IP may lead to significant changes to current AD PSR characteristics and capabilities that in turn affect the potential impact that the project may have. The S&IP states that mitigation of the adverse impacts of windfarms on current AD systems will be a stepping stone towards a longer-term solution that will enable co-existence.

- 17.9.3.11 In late summer 2023, the MOD launched Project NJORD, calling for potential AD solution providers to participate in prequalification trials. A total of 6 suppliers were put onto contract in March 2024 (Contract award notice 2024/S 000-008124) for the "*procurement of a framework of capabilities capable of mitigating the effects of windfarms to maintain the Recognised Air Picture of Air Defence (AD) Radars within the UK*". These suppliers include Lockheed Martin UK Limited, Serco Limited, and Thales UK Limited. Updates as to progress on Project NJORD are not currently in the public domain. However, the Secretary of State for DESNZ noted in a speech on 17 September 2024 that AD mitigation delays have been potentially impacting deployment of offshore wind through the Contracts for Difference Allocation Rounds.
- 17.9.3.12 The Clean Power 2030 Action Plan and National Policy Statement (NPS) for Energy (EN) 1 (2025) revealed the full costs of the long-term radar mitigation solutions identified by Programme NJORD, including RRH Benbecula/*Beinn nam Fadhl*a will be funded via an alternative route delivered by government, and the funding requirement is therefore removed from offshore wind developers.
- 17.9.3.13 The AD radar at RRH Benbecula/*Beinn nam Fadhl*a is a Lockheed Martin TPS-77 which has wind farm tolerant capabilities, involving the activation of a NAIZ in the lower beams of this 3D phased array. The application of a NAIZ requires modelling to be undertaken by the MOD's contractor, Serco, and evaluation of the operational impact of the application of the NAIZ by RAF personnel. While the MOD suspended applications of the NAIZ mitigation capability in 2018, it announced in June 2019 that it would resume consideration of TPS-77 modelling reports/mitigation proposals where the impact on operational capability was deemed to be acceptable. The establishment of a NAIZ may be appropriate to mitigate the impact of WTGs considering small northwest section of the Array Area where WTGs would be within RLoS.
- 17.9.3.14 Engagement with the MOD is ongoing. With suitable additional mitigation measures in place prior to the first rotation of WTGs (A009), the radar should not experience false targets/clutter from WTGs. The magnitude of the impact will therefore be reduced from high to low. Therefore, the residual effect is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

17.9.4 IMPACT TO NATS RADIO COMMUNICATIONS

- 17.9.4.1 During the O&M phase, infrastructure within the Array Area will consist of WTGs with a maximum tip height between 293.8 m and 338.4 m AMSL, and 1 OSP. WTGs have the potential to impact ATS where their size, quantity and locations result in VHF/UHF R/T with unacceptable levels of interference. This is caused by multipath interference from static elements, and signal modulation effects generated by rotating WTGs.
- 17.9.4.2 Within their scoping response (MD-LOT, 2024), NATS raised concerns regarding the unacceptable impact to the nearest AGA communication facility. NATS state that the Offshore Project may cause unacceptable levels of interference within the north and west of the Array Area. This impact is

limited, and prevalent at lower altitudes, although ATC customers indicate that the airspace in question is of significance to low level air operations.

- 17.9.4.3 When operational, WTGs have the potential to generate signal modulation effects, ultimately degrading the performance of VHF/UHF communications. If WTGs significantly degrade AGA communications, it may have an adverse impact on the provision of safe and effective en route surveillance.
- 17.9.4.4 Within their scoping response (MD-LOT, 2024), NATS raised concerns regarding their nearest AGA communication facility to the Array Area. To protect their AGA radio communication facilities, NATS have established a 10 km safeguarded zone around each facility. The nearest AGA is located 14.3 km to the southeast of the Array Area, outside of the safeguarded area. NATS have undertaken modelling which indicates that WTGs may cause degradation to radio communication signals serving airspace within north and west of the Array Area. This modelling indicates that the volume of impact is limited and prevalent at lower altitudes.
- 17.9.4.5 Within their scoping response (MD-LOT, 2024), NATS state that through engagement the impact to aviation radio communications can be reduced to an acceptable level or be completely eliminated. This can be achieved through careful design and positioning of WTGs within the Array Area.

Magnitude of Impact

- 17.9.4.6 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.
- 17.9.4.7 The impact is predicted to be of local spatial extent (i.e. limited to the vicinity of the Array Area), long term duration, continuous and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Medium**.

Sensitivity of Receptor

- 17.9.4.8 AGA communication stations are deemed to be of medium vulnerability, high recoverability and high value. The sensitivity is therefore considered to be **High**.

Significance of Effect

- 17.9.4.9 The sensitivity of the receptor is considered high. In absence of mitigation measures, the magnitude of the impact is medium. This significance of effect is considered to be **Moderate Adverse** and **Potentially Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

- 17.9.4.10 Additional mitigation highlighted in paragraph 17.9.4.5 will reduce the magnitude from medium to low. The residual significance of this effect is therefore considered to be **Minor Adverse** and **Not Significant** in EIA terms.

17.10 ASSESSMENT OF EFFECTS: DECOMMISSIONING

17.10.1 CREATION OF AN AVIATION OBSTACLE ENVIRONMENT

17.10.1.1 The decommissioning of the wind farm will involve tall crane vessels and the dismantling of infrastructure above sea level which may pose a physical obstruction to low flying aircraft, increasing the risk of collision or requiring aircraft to fly extended routes to avoid obstacles. A starting point of WTGs with a tip height between 293.8 m AMSL, and 338.4 m AMSL and 1 OSP, to no infrastructure is assumed. The assessment of impacts is robust for any combination of WTG parameters within these ranges.

17.10.1.2 Specifically, the aviation obstacle environment has the potential to impact the following receptors:

- Military low flying activity;
- Stornoway/*Steòrnabhagh* Airport IFPs;
- Commercial helicopter operations;
- Helicopters involved in SAR operations.

17.10.1.3 The maximum design scenario relating to Military and Civil Aviation during the construction phase are presented in **Table 17-11**.

17.10.1.4 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

Military Low Flying Activity

17.10.1.5 As detailed in **Table 17-12**, potential impacts on low flying activities in the vicinity of the Array Area will be mitigated through the development of a LMP (outlined in M033), and through the provision of the positions and heights of structures to the CAA in accordance with embedded mitigation measure M017 to enable appropriate inclusion in civil and military AIPs and marking on aeronautical charts.

17.10.1.6 Embedded mitigation (M017 and M033) in the form of compliance with international and national SARPs with respect to notification, charting, marking and lighting is listed in **Table 17-12**. This would make pilots aware of the infrastructure within the Array Area, and it is assumed that pilots will comply with aviation regulatory requirements and use the principle of 'see and avoid'. Under SERA Section 5005, pilots must maintain a minimum separation distance of 150 m (500 ft) above the highest obstacle within a radius of 150 m (500 ft) from the aircraft.

Magnitude of Impact

17.10.1.7 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

17.10.1.8 The impact on military low flying activity is predicted to be of local spatial extent, short to medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Low**.

Sensitivity of Receptor

17.10.1.9 Military low flying activity is deemed to be of low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

17.10.1.10 Considering the medium sensitivity of low flying activity and the low magnitude of effect, the overall residual effect on sensitive receptors, following the implementation of embedded mitigation measures, of an aviation obstacle environment during decommissioning is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

17.10.1.11 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

Offshore Helicopter Operations

17.10.1.12 As detailed in **Table 17-12**, potential impacts on any offshore helicopter operations in the vicinity of the Array Area will be mitigated through the development of a LMP (outlined in M033) in agreement with key aviation stakeholders and through the provision of the positions and heights of structures to the CAA in accordance with embedded mitigation measure M017 to enable appropriate inclusion in civil and military AIPs and marking on aeronautical charts.

17.10.1.13 The Array Area is more than 9 nm from the nearest offshore helideck. Embedded mitigation (M017 and M033) in the form of compliance with international and national SARPs with respect to notification, charting, marking and lighting is listed in **Table 17-12**. This would make pilots aware of the infrastructure within the Array Area, and it is assumed that pilots will comply with aviation regulatory requirements and use the principle of 'see and avoid'. Under SERA Section 5005, pilots must maintain a minimum separation distance of 150 m (500 ft) above the highest obstacle within a radius of 150 m (500 ft) from the aircraft.

Magnitude of Impact

17.10.1.14 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

17.10.1.15 The impact on offshore helicopter operations is predicted to be of local spatial extent, short to medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Low**.

Sensitivity of Receptor

17.10.1.16 Offshore helicopter operations are deemed to be low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

17.10.1.17 Considering the medium sensitivity of offshore helicopter operations and the low magnitude of effect, the overall residual effect on sensitive receptors, following the implementation of embedded mitigation measures, of the creation of an aviation obstacle environment during decommissioning is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

17.10.1.18 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

Search and Rescue Helicopters

17.10.1.19 As detailed in **Table 17-12**, potential impacts on offshore helicopter operations in the vicinity of the Array Area will be mitigated through the development of a LMP (M017 and M033) in agreement with key aviation stakeholders and through the provision of the positions and heights of structures to the CAA in accordance with embedded mitigation measure M017 to enable appropriate inclusion in civil and military AIPs and marking on aeronautical charts.

17.10.1.20 Embedded mitigation (M017 and M033) in the form of compliance with international and national SARPs with respect to notification, charting, marking and lighting is listed in **Table 17-12**. This would make pilots aware of the infrastructure within the Array Area.

17.10.1.21 Lighting of WTGs will meet MOD and SAR requirements, and the final WTG layout will be compatible with SAR helicopter operations. An ERCOP will be developed and implemented for all phases of the Offshore Project (outlined in M010).

Magnitude of Impact

17.10.1.22 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

17.10.1.23 The impact on SAR helicopters is predicted to be of local spatial extent (i.e. limited to the vicinity of the Array Area), medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Low**.

Sensitivity of Receptor

17.10.1.24 SAR helicopters are deemed to be of low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

17.10.1.25 Considering the medium sensitivity of SAR helicopter operations and the low magnitude of effect, the overall residual effect on sensitive receptors, following the implementation of embedded mitigation measures, of the creation of an aviation obstacle environment during decommissioning is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

17.10.1.26 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

17.10.2 INCREASED AIR TRAFFIC RELATED TO WIND FARM ACTIVITIES

17.10.2.1 The use of helicopters to support decommissioning phase for the Offshore Project may impact on existing air traffic in the vicinity of the Array Area. The potential increase in air traffic associated with the decommissioning phase brings with it a potential increased possibility of aircraft collision in the airspace around the Array Area.

17.10.2.2 The predicted low number of helicopter movements during decommissioning phase will be managed by the existing ATS infrastructure provided in accordance with national procedures, and pilots will be expected to operate in accordance with regulatory requirements.

17.10.2.3 The maximum design scenario relating to Military and Civil Aviation during the construction phase are presented in **Table 17-11**.

17.10.2.4 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

Magnitude of Impact

17.10.2.5 The magnitude of impact is based on the criteria detailed in Section 17.5.3 and **Chapter 5, Volume 1a**. A description of the likely magnitude of impact on receptors caused by each identified impact is given in the following paragraphs.

17.10.2.6 The impact is predicted to be of local spatial extent (i.e. limited to the Military and Civil Aviation study area), short to medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of effect is therefore considered to be **Low**.

Sensitivity of Receptor

17.10.2.7 Helicopter support operations and existing air traffic are deemed to be of low vulnerability and high recoverability and high value. The sensitivity of the receptor is therefore considered to be **Medium**.

Significance of Effect

17.10.2.8 The magnitude of the effect is deemed to be low, and the sensitivity of the receptor is medium. The residual effect resulting from this increase in air traffic related to wind farm activities during O&M is considered to be **Minor Adverse** and **Not Significant** in EIA terms.

Further Environmental Mitigation and Residual Effect

17.10.2.9 No additional Military and Civil Aviation mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the embedded commitments outlined in Section 17.7.2) is Not Significant in EIA terms.

17.11 Assessment of combined effects

17.11.1.1 The combined effects assessment considers likely significant effects from multiple impacts and activities from the construction, O&M, and decommissioning phases of the Offshore Project on the same receptor, or group of receptors. The overall method following in identifying and assessing potential Combined Effects in relation to the offshore environment is set out in **Chapter 5, Volume 1a**.

17.11.1.2 Combined effects could potentially arise in one of two ways. The first type of combined effect is a Project lifetime effect, where multiple phases of the Project (construction, O&M, and decommissioning) interact to create a potentially more significant effect on a receptor than in one phase alone. There is no anticipated project lifetime effect in relation to Military and Civil Aviation.

17.11.1.3 The second type of combined effect is receptor-led effects. Receptor-led effects are where effects from different environmental aspects combine spatially and temporally on a receptor. These effects may be short-term, temporary, transient, or longer-term.

17.11.1.4 Receptor-led effects have been considered, where relevant, in this chapter for potential interactions between Military and Civil Aviation and the following environmental aspects:

- **Chapter 6: Socio-Economics, Volume 2b;**
- **Chapter 14: Marine and Nearshore Ornithology, Volume 2b;**
- **Chapter 16: Shipping and Navigation, Volume 2b;**
- **Chapter 18: Seascape, Landscape and Visual Impact Assessment, Volume 2b.**

17.11.1.5 Full results of the receptor-led effects assessment can be found in **Chapter 23: Combined Effects Assessment, Volume 2a**.

17.12 CONSIDERATION OF ONSHORE TRANSMISSION WORKS PROJECT

- 17.12.1.1 A separate application for the Project's onshore elements (the OTW Project) that includes all infrastructure landwards of Mean Low Water Springs (MLWS) within the Onshore Transmission Works Boundary will be made, under the Town and Country Planning (Scotland) Act 1997 to Comhairle nan Eilean Siar (CnES). The OTW Project EIAR will provide a full description of the onshore elements of the Project landward of MLWS, and include an assessment of the associated likely significant effects.
- 17.12.1.2 This EIAR has considered the additive interactions between the Offshore Project and OTW Project to understand if there is the potential for any change to the assessment outcomes as a result of both elements of the Project. The approach to identify and consider potential interactions between the Offshore Project and OTW Project is set out in **Chapter 5, Volume 1a** and key design parameters associated with the OTW Project are summarised in **Chapter 3, Volume 1a**.
- 17.12.1.3 The potential for effects identified in **Table 17-5** to interact with effects associated with the OTW Project at a common receptor has been considered. Further assessment of the onshore components of the Project was scoped out from requiring further assessment in the Scoping Report (Spiorad na Mara Ltd, 2023). The Applicant has consulted with aviation stakeholders throughout the pre-application stage (see Section 17.3) and will continue to engage during the application determination and post-consent on the detail design of the Project.
- 17.12.1.4 Following consideration of the OTW Project and likely ZOI and influence on common receptors, there are no pathways that have the potential to effect Military and Civil receptors. As a result of this, there is no pathway for the Military and Civil Aviation effects of the Offshore Project to interact in addition to the OTW Project and this is not considered further.

17.13 ASSESSMENT OF CUMULATIVE EFFECTS

17.13.1 APPROACH

- 17.13.1.1 A cumulative effects assessment (CEA) examines the potential for impacts of the Offshore Project in addition with 'Other Developments' (including the OTW Project), on the same single receptor or resource and the contribution of the Offshore Project to those impacts. The overall method following in identifying and assessing potential cumulative effects in relation to the offshore environment is set out in **Chapter 5, Volume 1a**.
- 17.13.1.2 The offshore screening approach is based on the Planning Inspectorate's Advice Note Nine (Planning Inspectorate, 2018) and Advice Note Seventeen (Planning Inspectorate, 2024), with relevant components of the RenewableUK (RenewableUK, 2013) accepted guidance, which includes aspects specific to the marine elements of an offshore wind farm, addressing the need to consider mobile wide-ranging species (foraging species, migratory routes etc).

17.13.1.3 The screening approach for Military and Civil Aviation is based on a range that represents a precautionary maximum distance at which effects from military, aviation, and radar could occur.

17.13.1.4 The conclusions of the assessment of the Offshore Project and any additional effect arising from the OTW Project as identified in this chapter have been considered in this CEA. However, given the assumed mitigation and conclusion drawn within Section 17.12 there are no material additional impacts resulting from the OTW Project.

17.13.2 CUMULATIVE EFFECTS ASSESSMENT

17.13.2.1 For this Military and Civil Aviation assessment, a Zone of Influence (ZOI) has been considered for relevant effects, as shown in **Figure 17.4, Volume 2b**.

17.13.2.2 The ZOI considered offshore wind farm projects within a 100 km range of the Array Area. This distance is the maximum range at which radar cumulative effects are considered likely to occur. The potential cumulative effect of radar impacts on ATC operations diminishes as the separation between wind farm sites increases. A separation distance of 100 km is considered a pragmatic range beyond which cumulative effects will be negligible. The potential cumulative effect of radar impacts occurs when one radar has RLoS of WTGs of the Offshore Project and another wind farm project. Other projects located beyond 100 km will not be close enough to the Offshore Project to cause a cumulative impact to radars because they are unlikely to have RLoS of both wind farms.

17.13.2.3 There will be no cumulative impact as a result of the creation of an aviation obstacle environment. Other wind farm projects in development will have mitigation measures in place prior to construction which should remove the potential for cumulative effect.

17.13.2.4 A short list of Other Developments that may interact with the Offshore Project ZOIs during their construction, O&M or decommissioning is presented in **Appendix 5.3: Cumulative effects assessment shortlisted developments, Volume 1c**. This list has been generated applying criteria set out in **Chapter 5, Volume 1a** and has been collated up to the finalisation of the EIAR through desk study, consultation, and engagement.

17.13.2.5 Only those Other Developments in the short list that fall within the Military and Civil Aviation ZOI have the potential to result in cumulative effects with the Offshore Project on Military and Civil Aviation. All 'other developments' falling outside the Military and Civil Aviation ZOI are excluded from this assessment. The following types of 'other development' have the potential to result in cumulative effects on Military and Civil Aviation:

- Other offshore wind farms;
- Other onshore wind farms;
- Oil and gas platforms.

17.13.2.6 On the basis of the above, the Other Developments that are scoped into the Military and Civil Aviation CEA are outlined in **Table 17-15**. It should be noted that Other Developments which are

proposed or under construction at the time of writing this chapter, are included in the table below with the information available.

Table 17-15: Other Developments considered as part of the Military and Civil Aviation CEA.

ID	Development type	Application reference	Description of development	Status	Timescale ¹	Confidence in assessment	Tier ²	Distance to the Offshore Project
1	Stornoway Wind Farm	ON-002	Onshore Wind Farm	Consented	Consent approved in 2022. The Applicant indicates that all required bird surveys are to be carried out in 2024 and pre-construction activities are to commence in 2026.	High	1	Approximately 27 km to the south of the Offshore Project
2	Talisk (Scotwind Plan Option Area N3)	OWF-024	Offshore Wind Farm	Scoping Stage	Operational in 2032, expected to 35 years.	Medium	2	Approximately 25 km north northeast of the Offshore Project

¹ The Planning Inspectorate Advice Note 17 states 'Where other developments are expected to be completed before construction of the proposed Major Infrastructure Project and the effects of those projects are fully determined, effects arising from them should be considered as part of the baseline and may be considered as part of both the construction and operational assessment.'

² Chapter 5 sets out the full definitions of the tiers. Tier 1: high level of certainty or information availability (including under construction or where a planning application has been approved or is awaiting decision). Tier 2: medium level of certainty or information (such as developments where a Scoping Report has been submitted). Tier 3: low level of certainty or information available (no planning applications submitted or identified for potential future development only).

ID	Development type	Application reference	Description of development	Status	Timescale ¹	Confidence in assessment	Tier ²	Distance to the Offshore Project
3	Havbredey Offshore Wind Farm	OWF-026	Offshore Wind Farm	Scoping Stage	Construction expected to begin in 2029 and last for 3 years, Operational lifespan expected 30 to 35 years, Decommissioning programming expected to take 3 to 5 years.	Medium	3	Approximately 52 km northeast of the Offshore Project.

- 17.13.2.7 A description of the significance of cumulative effects upon Military and Civil Aviation receptors arising from each identified impact is given below. The cumulative effects assessment has been based on information publicly available in the planning application documents for the Other Developments. It is noted that the maximum assessment assumptions quoted within these planning applications (EIARs) are often refined during the determination period and in the post-consent phase such that the final scheme's build out may have a reduced impact when compared to what has previously been assessed.
- 17.13.2.8 The receptor included within the CEA for Military and Civil Aviation is the Benbecula/*Beinn nam Fadhla* radar.

17.13.3 OPERATION AND MAINTENANCE

Impact to military Benbecula/*Beinn nam Fadhla* air defence radar

- 17.13.3.1 The Array Area will be within operational range of RRH Benbecula/*Beinn nam Fadhla*. Radar detection of rotating WTG blades from multiple OWF developments may result in a significant increase in clutter being generated over a larger area on radar displays. This may compromise the ability of the MOD to undertake its AD role.
- 17.13.3.2 RLoS analysis detailed in **Appendix 17.1, Volume 2c** indicates that WTGs within the west of the Array Area may be within RLoS of RRH Benbecula/*Beinn nam Fadhla*. The closest onshore wind farm to the Array Area is Stornoway Wind Farm, located approximately 21 km to the south. Within their EIAR, it was determined that no AD radars would have RLoS of WTGs at Stornoway Wind Farm. Therefore, there should be no cumulative impact from onshore wind farms to RRH Benbecula/*Beinn nam Fadhla*.
- 17.13.3.3 The nearest offshore wind farms to the Array Area are Talisk Offshore Wind Farm and Havbredey Offshore Wind Farm, situated approximately 25 km and 52 km to the northeast respectively. RLoS analysis conducted for Talisk Offshore Wind Farm indicates that RRH Benbecula/*Beinn nam Fadhla* will not have RLoS of WTGs. The Havbredey Offshore Wind Farm Offshore Scoping Report states that previous assessments indicates that there is no possibility that WTGs will be within RLoS of RRH Benbecula/*Beinn nam Fadhla*. Therefore, there should be no cumulative impact from offshore wind farms to RRH Benbecula/*Beinn nam Fadhla*.

Sensitivity of Receptor

- 17.13.3.4 PSRs are deemed to be of high vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore considered to be **High**.

Magnitude of Effect

- 17.13.3.5 The impact of the Project is predicted to be of regional spatial extent, long term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor directly. Considering WTGs within other wind farms are not within RLoS of RRH Benbecula/*Beinn nam*

Fadhla, the physical extent of the cumulative impact is considered to be negligible. The magnitude of effect is therefore considered to be **Negligible**.

Significance of Effect

- 17.13.3.6 The sensitivity of the receptor is high. Considering the absence of RLoS between RRH Benbecula/*Beinn nam Fadhla* and other offshore wind farms, the magnitude of the effect will be reduced from high to negligible. Therefore, the residual cumulative effect on RRH Benbecula/*Beinn nam Fadhla* is considered to be **Negligible** and **Not Significant** in EIA terms.

17.14 TRANSBOUNDARY EFFECTS

- 17.14.1.1 Transboundary effects occur when a development in one European Economic Area (EEA) State impacts the environment of another EEA State(s). A screening of potential transboundary effects was undertaken within the **Scoping Report**.
- 17.14.1.2 **Chapter 5, Volume 1a** provides details of the generic framework and approach to the assessment of transboundary effects.
- 17.14.1.3 The Offshore Project is located a significant distance from the nearest adjacent EEA of another state and, therefore it is considered that transboundary impacts will not occur and these are not discussed any further.

17.15 SUMMARY OF RESIDUAL EFFECTS

- 17.15.1.1 **Table 17-16** presents a summary of the assessment of significant impacts, any relevant mitigation measures, and residual effects on Military and Civil Aviation receptors.

Table 17-16: Summary of residual effects

Activity and impact	Receptor	Magnitude of impact	Receptor sensitivity	Embedded mitigation measures	Significance of effect (significance)	Further environmental mitigation	Significance of residual effect (significance)
Construction							
Creation of an aviation obstacle environment	Military Low Flying Activity	Low	Medium	M017, M033	Minor adverse (Not Significant)	N/A	N/A
	Aircraft Flying Stornoway Airport IFP	Medium	High		Moderate Adverse (Potentially Significant)	A008	Minor adverse (Not Significant)
	Offshore Helicopter Operations	Low	Medium	M017, M033	Minor Adverse (Not Significant)	N/A	N/A
	SAR Helicopters	Low	Medium	M010, M017, M033	Minor Adverse (Not Significant)	N/A	N/A
Increased air traffic related to wind farm activities	Existing air traffic	Low	Medium	M017, M033	Minor Adverse (Not Significant)	N/A	N/A
Operation and maintenance							
Creation of an aviation obstacle environment	Military Low Flying Activity	Low	Medium	M017, M033	Minor Adverse (Not Significant)	N/A	N/A
	Offshore Helicopter Operations	Low	Medium	M017, M033	Minor Adverse (Not Significant)	N/A	N/A
	SAR Helicopters	Low	Medium	M010, M017, M033	Minor Adverse (Not Significant)	N/A	N/A
Increased air traffic related to	Existing air traffic	Low	Medium	M017, M033	Minor Adverse (Not Significant)	N/A	N/A

Activity and impact	Receptor	Magnitude of impact	Receptor sensitivity	Embedded mitigation measures	Significance of effect (significance)	Further environmental mitigation	Significance of residual effect (significance)
wind farm activities							
Impact to military radars	Benbecula/Beinn nam Fadhla Air Defence Radar	High	High	N/A	Major Adverse (Significant)	A009	Minor Adverse (Not Significant)
Impact to NATS radio communications	ATS	Medium	High	N/A	Minor Adverse (Not Significant)	N/A	N/A
Decommissioning							
Creation of an aviation obstacle environment	Military Low Flying Activity	Low	Medium	M017, M033	Minor Adverse (Not Significant)	N/A	N/A
	Offshore Helicopter Operations	Low	Medium	M017, M033	Minor Adverse (Not Significant)	N/A	N/A
	SAR Helicopters	Low	Medium	M010, M017, M033	Minor Adverse (Not Significant)	N/A	N/A
Increased air traffic related to wind farm activities	Existing air traffic	Low	Medium	M017, M033	Minor Adverse (Not Significant)	N/A	N/A

17.16 GLOSSARY OF TERMS AND ABBREVIATIONS

17.16.1.1 A list of key terms and acronyms used in this chapter are provided in **Table 17-17** and **Table 17-18**.

Table 17-17 Acronyms and abbreviations

Term	Definition
ACP	Airspace Change Proposal
AD&OW	Air Defence and Offshore Wind
AD	Air Defence
AGA	Air-Ground-Air
AGL	Above Ground Level
AIC	Aeronautical Information Circular
AIFS	Aviation Impact Feasibility Study
AIP	Aeronautical Information Publication
AMSL	Above Mean Sea Level
ANO	Air Navigation Order
APDO	Approved Procedure Design Organisation
ATC	Air Traffic Control
ATS	Air Traffic Services
BEIS	Business, Energy and Industrial Strategy
BVLOS	Beyond Visual Line of Sight
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
cd	candela
CEA	Cumulative Effects Assessment
CEMP	Construction Environmental Management Plan
CTA	Control Area
DESNZ	Department for Energy Security and Net Zero
DGC	Defence Geographic Centre
DIO	Defence Infrastructure Organisation
DSLIP	Design Specification and Layout Plan
EEA	European Economic Area
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ERCOP	Emergency Response and Cooperation Plan
FIR	Flight Information Region
FL	Flight Level
EN	Energy
GNSS	Global Navigation Satellite System
HAT	Highest Astronomical Tide
HCA	Helideck Certification Agency

Term	Definition
HDD	Horizontal Directional Drilling
HIAL	Highlands and Islands Airports Limited
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
JUV	Jack-Up Vessel
km	Kilometre
LFA	Low Flying Area
LMP	Lighting and Marking Plan
MAA	Military Aviation Authority
MCA	Maritime and Coastguard Agency
MD-LOT	Marine Directorate Licensing Operations Team
MGN	Marine Guidance Note
MOD	Ministry of Defence
NAIZ	Non-Auto Initiation Zone
NLB	Northern Lighthouse Board
nm	Nautical Mile
NOTAM	Notice to Aviation
NPS	National Policy Statement
NSTA	North Sea Transition Authority
O&M	Operation and Maintenance
OEMP	Offshore Environmental Management Plan
OPERA	Operational Programme for the Exchange of Weather Radar Information
OREI	Offshore Renewable Energy Infrastructure
OSP	Offshore Substation Platform
OWF	Offshore Wind Farm
PAC	Preliminary Application Consultation
PEXA	Practice and Exercise Area
PSR	Primary Surveillance Radar
R/T	Radio Telephony
RAF	Royal Air Force
RLoS	Radar Line of Sight
RRH	Remote Radar Head
S&IP	Strategy and Implementation Plan
SAR	Search and Rescue
SARP	Standards and Recommended Practice
SERA	Standardised European Rules of the Air
SLHA	Space Launch Hazard Area
SLVIA	Seascape, Landscape and Visual Impact Assessment
SME	Subject Matter Expert
SMS	Safety Management System
SSR	Secondary Surveillance Radar
TMZ	Transponder Mandatory Zone

Term	Definition
TOPA	Technical and Operational Assessment
TRA	Temporary Reserved Area
UHF	Ultra High Frequency
UK	United Kingdom
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
WTG	Wind Turbine Generator
ZOI	Zone of Influence

Table 17-18 Glossary

Term	Meaning
Applicant	Spiorad na Mara Limited (the Project owner).
Array Area	The offshore area within which the offshore wind turbine generators (WTGs), associated foundations, Offshore Cables, and Offshore Substation Platform (OSP) (if required), will be located. This area encompasses the Turbine Area that will contain all above water surface infrastructure (WTGs / OSP) and an additional area within which further below water infrastructure (foundations and cables) may also be located.
Baseline	Existing conditions as represented by the latest available data, whether from literature or survey and used as a benchmark for making comparisons to assess the impact of a development or project.
Baseline conditions	The environment as it appears (or would appear) immediately prior to the implementation of a project, together with any known or foreseeable future changes that will take place before its completion.
Combined Effects	Combined effect of the individual development on one particular receptor; for example noise, dust and visual. This includes Project-Lifetime Effects and Receptor-Led Effects.
Controlled Airspace	Defined airspace within which pilots must follow Air Traffic Control instructions. In the UK, Classes A, C, D and E are areas of controlled airspace.
Cumulative Effects	Considers the likely significant effects of multiple impacts and activities from several developments.
Cumulative Effects Assessment (CEA)	Assessment of effects as a result of the incremental changes caused by other past, present and reasonably foreseeable human activities and natural processes together with the Offshore Project.
Decommissioning phase	The period during which a development and its associated processes are withdrawn from service.
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.

Term	Meaning
EIA Regulations	<p>Terminology used in the Environmental Impact Assessment Report to refer to three sets of EIA regulations:</p> <ul style="list-style-type: none"> • The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, with regard to the Section 36 consent application for the Offshore Project; • The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017, in relation to the Offshore Project with regard to marine licence applications; • Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, with regard to consent for the Onshore Transmission Works (OTW).
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed project or development over and above the existing circumstances (or 'baseline').
Environmental Impact Assessment Report (EIAR)	The Environmental Impact Assessment Report (EIAR) prepared to assess the likely significant effects of the Project on the environment.
Embedded or 'Designed-in' Mitigation	Mitigation measures to avoid or reduce environmental effects that are directly incorporated into the preferred design for the Project. This can include standard practice in accordance with or without guidance. Embedded mitigation is considered as part of the impact assessment, before effect significance is identified.
Flight Information Region (FIR)	Airspace managed by a controlling authority with responsibility for ensuring air traffic services are provided to aircraft flying within it.
Flight Level (FL)	An aircraft altitude expressed in hundreds of feet at a standard sea level pressure datum of 1013.25 hectopascals.
Future Baseline	Refers to the situation in future years without the Offshore Project.
Grid Substation	The onshore substation located adjacent to and connecting to the SSEN substation. This allows the voltage to be increased to meet onward transmission requirements.
Impact	Change that is caused by an action; for example, foundation installation (action) during construction which results in habitat loss (impact).
Impact pathway	<p>The EIA for the Offshore Project utilises the 'source-pathway-receptor' model to identify relevant receptors, where applicable. This model highlights potential impacts of the Offshore Project on environmental receptors, establishing a clear link between impact sources and receptor.</p> <p>The impact pathway is the route through which the potential impacts (as a result of an effect of an activity) could reach a receptor.</p>
Instrument Flight Rules (IFR)	IFR are rules which allow properly equipped aircraft to be flown under Instrument Meteorological Conditions (IMC).

Term	Meaning
Instrument Meteorological Conditions	IMC are meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for Visual Meteorological Conditions (VMC).
Landfall	This consists of works from offshore Horizontal Directional Drill (HDD) exit pits (located below MLWS) to onshore at the Transition Joint Bays (TJB) (located above MHWS). The infrastructure and installation methods associated with the Landfall involves both onshore and offshore components.
Landfall Substation	The optional onshore substation located on the west side of the Isle of Lewis/ <i>Eilean Leòdhais</i> . Includes the platform, buildings and associated components which allows the voltage to be increased to meet onward transmission requirements.
Likely Significant Effects	With respect to the Electricity Works (EIA (Scotland) Regulations 2017 and The Marine Works (EIA) Regulations 2017, a significant effect that may reasonably be predicted as a consequence of a plan or project, on the receiving environment.
Magnitude (of change)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short term or long term in duration'. Also known as the 'degree' or 'nature' of change.
Maximum Design Scenario	The scenario within the Project Design Envelope with the potential to result in the greatest impact on a particular topic receptor, and therefore the one that should be assessed for that topic receptor. See Chapter 3: Project Description, Volume 1a for detailed description.
Offshore Project	The offshore components of the Sporad na Mara offshore wind farm (the Project) located seaward of Mean High Water Springs (MHWS).
Offshore Project Boundary	The 'red line boundary' encompassing the Offshore Project.
Offshore Substation Platform (OSP)	The optional offshore substation located within the Turbine Area. Includes the platform and associated components which allows the voltage to be increased to meet onward transmission requirements.
Offshore Windfarm (OWF)	A group of WTGs located offshore.
Onshore Transmission Works (OTW) / Onshore Project	The onshore components of the Sporad na Mara offshore wind farm (the Project) located landward of Mean Low Water Springs (MLWS). The Applicant will seek consent for the OTW Project through a separate application and so does not form part of this application.
Operation and Maintenance (O&M) phase	The period during which a development is operational and being maintained.
Primary Surveillance Radar (PSR)	A radar system that measures the bearing and distance of targets using the detected reflections of radio signals.
Project	The Sporad na Mara offshore wind farm development. This term describes the whole development, including all offshore and onshore components.

Term	Meaning
Project Boundary	The 'red line boundary' encompassing all offshore and onshore components of the Project.
Project Design Envelope	A description of the range of possible components that make up the Project design options under consideration when the exact engineering parameters are not yet known.
Scoping Opinion	A report presenting the written opinion of the Scottish Ministers, in consultation with Comhairle nan Eilean Siar (CnES) for the Onshore Project, as to the scope and level of detail of information to be provided in the Environmental Impact Assessment (EIA) for the Project.
Scoping Report	A document submitted by a developer that outlines the potential environmental issues and effects of a proposed project to determine which topics, methods, and level of detail should be included in the full Environmental Impact Assessment (EIA).
Secondary Surveillance Radar (SSR)	A radar system that transmits interrogation pulses and receives transmitted responses from suitably equipped targets.
Significance	A measure of the importance of the environmental effect, defined by criteria specific to the environmental aspect.
Significant effect	<p>It is a requirement of the EIA Regulations 2017 to determine the likely significant effects of the development on the environment, which should relate to the level of an effect and the type of effect. Where possible significant effects should be mitigated.</p> <p>The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and the sensitivity of the receptor) that should be attached to the impact described.</p> <p>Whether or not an effect should be considered significant is not absolute and requires the application of professional judgement.</p> <p>Significant – 'noteworthy, of considerable amount or effect or importance, not insignificant or negligible' (The Concise Oxford Dictionary).</p> <p>Those levels and types of landscape and visual effect likely to have a major or important / noteworthy or special effect of which a decision maker should take particular note.</p>
Transboundary effects	Assessment of changes to the environment caused by the combined effect of past, present and future human activities and natural processes on other European Economic Area Member States.
Turbine Area	A reduced area within the Array Area where above water surface infrastructure would be located i.e. wind turbine generators (WTG) or Offshore Substation Platform (OSP) (if required). This area has been developed and refined through stakeholder consultation and environmental assessment.
Uncontrolled Airspace	Defined airspace in which Air Traffic Control does not exercise exclusive authority but may provide basic information services to aircraft in radio contact. In the UK, Class G is uncontrolled airspace.

Term	Meaning
Visual Flight Rules (VFR)	VFR are the rules that govern the operation of aircraft in VMC, conditions in which flight solely by visual reference is possible.
Visual Meteorological Conditions	VMC are the meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling equal to or better than specified minima.
Wind Turbine Generator (WTG)	The wind turbines that generate electricity consisting of tubular towers and blades attached to a nacelle housing mechanical and electrical generating equipment

17.17 REFERENCES

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