Environmental Impact Assessment Report
Volume 1, Chapter 31: Civil and Military Aviation

MarramWind Offshore Wind Farm

December 2025

MarramWind

Document code:	MAR-GEN-ENV-REP-WSP-000036
Contractor document number:	852346-WEIS-IA-O1-RP-C5-386989
Version:	Final for Submission
Date:	08/12/2025
Prepared by:	Cyrrus Limited
Checked by:	WSP UK Limited
Accepted by:	MarramWind Limited

Contents

31. Civil and Military Aviation

31.1 Introduction

31.1.1.1 This civil and military aviation Chapter of the Environmental Impact Assessment (EIA) Report presents the results of the assessment of the likely significant effects on aviation receptors that may arise from the construction, operation and maintenance (O&M) and decommissioning of the offshore and onshore Project seaward of Mean High Water Springs (MHWS) and landward of Mean Low Water Springs (MLWS). It should be read in conjunction with the project description provided in **Chapter 4: Project Description** and the relevant parts of the following Chapters and Appendices:

- **Chapter 15: Shipping and Navigation:** This aspect considers the potential impact on emergency response capability and access for search and rescue (SAR) assets; and
- **Chapter 18: Infrastructure and Other Marine Users**: This aspect scopes out potential impacts on military Practice and Exercise Areas (PEXA), which are designated areas of the sea where military exercises can be undertaken.

31.1.1.2 This Chapter describes:

- the legislation, planning policy, guidance and other documentation that has informed the assessment (**Section 31.2: Relevant legislative and policy context**);
- the outcome of consultation and engagement that has been undertaken to date, including how matters relating to civil and military aviation have been addressed (**Section 31.3: Consultation and engagement**);
- the scope of the assessment for civil and military aviation (**Section 31.4: Scope of the assessment**);
- the data sources and methods used for gathering baseline data including surveys where appropriate (**Section 31.5: Methodology for baseline data gathering**);
- the overall environmental baseline (**Section 31.6: Baseline conditions**);
- the basis for the EIA Report (**Section 31.7: Basis for the EIA**);
- methodology for EIA Report (**Section 31.8: Methodology for EIA Report);**
- the assessment of civil and military aviation effects (**Section 31.9 Assessment of effects: construction stage; Section 31.10: Assessment of effects: operation and maintenance** ; and **Section 31.11: Assessment of effects: decommissioning**);
- a summary of effects (**Section 31.12: Summary of effects**)'
- consideration of transboundary effects (**Section 31.13: Transboundary effects**);
- consideration of inter-related effects and cumulative effects (**Section 31.14: Inter-related effects** and **Section 31.15: Cumulative effects assessment**);
- a summary of residual effects for civil and military aviation (**Section 31.16: Summary of residual likely significant effects**);
- a reference list is provided (**Section 31.17: References**); and
- a glossary of terms and abbreviations is provided (**Section 31.18: Glossary of terms and abbreviations**).

31.1.1.3 This Chapter is also supported by the following Appendices in **Volume 3**:

- **Appendix 31.1: Airspace Analysis and Radar Modelling**.

31.2 Relevant legislative and policy context and technical guidance

31.2.1 Legislative and policy context

31.2.1.1 This Section identifies the relevant legislation and policy context that has informed the scope of the civil and military aviation assessment. Further information on policies relevant to the EIA and their status is set out in **Chapter 2: Legislative and Policy Context**, which provides an overview of the relevant legislative and policy context for the Project. **Chapter 2: Legislative and Policy Context** is supported by **Volume 3, Appendix 2.1: Planning Policy Framework**, which provides a detailed summary of international, national, marine and local planning policies of relevance to the EIA. Individual policies of specific relevance to this assessment and associated appendices have been taken into account.

31.2.1.2 This summary provides a foundation for understanding the specific requirements that this Chapter must address in terms of assessing and mitigating impacts on receptors and relevant environmental issues.

31.2.1.3 The legislation relevant to civil and military aviation include:

- The Rules of the Air Regulations 2015;
- The Air Navigation Order 2016; and
- Civil Aviation Act 1982.

31.2.1.4 The policies relevant to civil and military aviation include:

- Draft Updated Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2025);
- Overarching National Policy Statement for Energy EN-1 (Department for Energy Security and Net Zero (DESNZ), 2023);
- National Policy Statement for Renewable Energy Infrastructure EN-3 (DESNZ, 2023);
- National Planning Framework 4 (Scottish Government, 2023a);
- Aberdeenshire Local Development Plan 2023 (Aberdeenshire Council, 2023a)
- Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2020);
- Scotland's National Marine Plan (Scottish Government, 2015); and
- UK Marine Policy Statement (Department for Environment, Food and Rural Affairs (DEFRA), 2011).

31.2.2 Relevant technical guidance

31.2.2.1 Other information and technical guidance relevant to the assessment undertaken for civil and military aviation include:

- Civil Aviation Publication (CAP) 032: UK Aeronautical Information Publication (AIP) (CAA, 2025);

- UK Military AIP (Ministry of Defence (MOD), 2025);
- Offshore Renewable Energy Installations: Requirements, Guidance and Operational Considerations for SAR and Emergency Response (MGN 654 Annex 5) (MCA, 2024);
- CAP 437: Standards for Offshore Helicopter Landing Areas (CAA, 2023a);
- CAP 1616h: Guidance on Airspace Change Process for Level 3 and Pre-Scaled Airspace Change Proposals (CAA, 2023b);
- CAP 168: Licensing of Aerodromes (CAA, 2022);
- International Civil Aviation Organisation (ICAO) Annex 14 Aerodromes: Volume 1 Aerodrome Design and Operations (ICAO, 2022);
- Marine Guidance Note (MGN) 654 Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response (Maritime and Coastguard Agency (MCA), 2021);
- CAP 393: Regulations Made Under Powers in the Civil Aviation Act 1982 and the Air Navigation Order 2016 (CAA, 2021a);
- CAP 774: UK Flight Information Services (CAA, 2021b);
- MOD Obstruction Lighting Guidance (MOD, 2020);
- CAP 670: Air Traffic Services (ATS) Safety Requirements (CAA, 2019);
- CAP 764: Policy and Guidelines on Wind Turbines (CAA, 2016);
- ICAO EUR DOC 015: European Guidance Material on Managing Building Restricted Areas (ICAO, 2015); and
- CAP 793: Safe Operating Practices at Unlicensed Aerodromes (CAA, 2010).

31.3 Consultation and engagement

31.3.1 Overview

31.3.1.1 This Section describes the consultation and stakeholder engagement undertaken on the Project in relation to civil and military aviation. This includes early engagement, the outcome of and response to the Scoping Opinions (Scottish Government, 2023b; Aberdeenshire Council, 2023b) in relation to the civil and military aviation assessment, non-statutory consultation, and the findings of the Project's Statutory Consultation. An overview of engagement undertaken for the Project as a whole can be found in Section 5.5 of **Chapter 5: Approach to the EIA**.

31.3.2 Key issues

31.3.2.1 A summary of the key issues raised during statutory and non-statutory consultation, specific to civil and military aviation, is outlined in **Table 31.1**, together with how these issues have been considered in the production of this EIA Report.

Table 31.1 Stakeholder issues responses – civil and military aviation

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
MOD	202	3 April 2023, Aberdeenshire Council's Scoping Opinion Representation (Aberdeenshire Council, 2023b).	"*Thank you for consulting the Ministry of Defence (MOD) on the above development, consultation correspondence was received by this office on 15 February 2023. This letter is in response to the onshore aspect of the proposed Offshore Windfarm only.* *The Defence Infrastructure Organisation (DIO) Safeguarding Team represents the Ministry of Defence (MOD) as a consultee in UK planning and energy consenting systems to ensure that development does not compromise or degrade the operation of defence sites such as aerodromes, explosives storage sites, air weapon ranges, and technical sites or training resources such as the Military Low Flying System.*"	This Chapter assesses impacts to aviation-related assets and receptors, including those specified by MOD in its Scoping response.
MOD	203	03 April 2023, Aberdeenshire Council's Scoping Opinion Representation (Aberdeenshire Council, 2023b).	"*The applicant is seeking a scoping opinion on the proposed onshore infrastructure for Marram Wind Offshore Windfarm and has provided a scoping boundary for the infrastructure within the vicinity of Peterhead and New Deer. The applicant has provided an Environmental Impact Assessment- scoping report dated January 2023 which states that the details provided at this stage are indicative and are subject to further ongoing design refinements*."	**Chapter 3: Site Selection and Consideration of Alternatives** provides details of the design refinements following submission of the Scoping Report in January 2023. **Chapter 4: Project Description** describes the Project assessed in the EIA Report.
MOD	205	03 April 2023, Aberdeenshire Council's Scoping Opinion Representation (Aberdeenshire Council, 2023b).	"*The land identified through the submitted application documents falls within statutory technical safeguarding zones surrounding Remote Radar Head (RRH) Buchan*."	Noted.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
MOD	206	03 April 2023, Aberdeenshire Council's Scoping Opinion Representation (Aberdeenshire Council, 2023b).	"*After review of the submitted documents relating to this scoping opinion, I can confirm that at this time the MOD has no concerns regarding the onshore aspect of this proposal. However, at such time as the design for the onshore element of this development becomes more mature a safeguarding assessment will be required to ensure that the proposed landfall, substations and grid connections will have no impact on the operation and capability of technical assets deployed at RRH Buchan*."	Impacts of onshore infrastructure on RRH Buchan are scoped out of assessment in **Table 31.4**.
MOD	207	03 April 2023, Aberdeenshire Council's Scoping Opinion Representation (Aberdeenshire Council, 2023b).	"*The MOD requests that we are further consulted at all stages of this development*."	Noted.
MOD	208	03 April 2023, Aberdeenshire Council's Scoping Opinion Representation (Aberdeenshire Council, 2023b).	"*The MOD must emphasise that the advice provided within this letter is in response to the information detailed in the developer's documents titled Scoping Boundary drawing number 808368-WOOD-IA-SC-FG-I3-34620 and Environmental Impact Assessment-Scoping Report MarramWind Offshore Wind Farm dated January 2023. Any variation of the parameters (which include the location, dimensions, form, and finishing materials) detailed may significantly alter how the development relates to MOD safeguarding requirements and cause adverse impacts to safeguarded defence assets or capabilities. In the event that any amendment, whether considered material or not by the determining authority, is submitted for approval, the MOD should be consulted and provided with adequate time to carry out assessments and provide a formal response*."	Noted.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
Aberdeenshire Council	211	26 April 2023, Aberdeenshire Council's Scoping Opinion Addendum.	"*The baseline conditions are noted for the various military and civil aviation and telecommunications receptors. The likely significant effects as noted in Table 7.4.5 are also noted. The Council agrees with the approaches indicated within this table in terms of the scoping in and out of topics*."	Noted.
Aberdeenshire Council.	213	26 April 2023, Aberdeenshire Council's Scoping Opinion Addendum.	"*The MOD, in their response dated 03 April, notes the technical safeguarding zones surrounding the Remote Radar Head (RRH) Buchan, and that the onshore portion of the development lies within safeguarded areas. It is confirmed that no concerns are had at this stage, it is however recommended that as the design for the onshore element of the development matures, further engagement should be sought with the MOD*."	Noted.
Aberdeenshire Council.	215	26 April 2023, Aberdeenshire Council's Scoping Opinion Addendum.	"*It is reiterated that this should be read alongside the earlier screening response. Continued engagement with consultees is encouraged as the development area is refined to ensure accurate advice is given. Contact details for consultees can be given upon request, and I am happy to assist co-ordinate any meetings*."	Noted.
Marine Directorate – Licensing Operations Team (MD-LOT).	386	12 May 2023, MD-LOT Scoping Opinion (Scottish Government, 2023b).	"*The Scottish Ministers highlight the NATS representation which predicts that the Proposed Development will cause primary false plots to be generated for both Allanshill and Perwinnes RADAR and reduce the RADAR's probability of detection of real aircraft. The Scottish Ministers advise that the Developer validates this position in relation to the generation of radar clutter and explore how this could be mitigated in the EIA Report*."	Modelling in **Volume 3, Appendix 31.1** confirms that Allanshill and Perwinnes radars would detect wind turbine generators (WTGs) within the Option Agreement Area (OAA). Possible mitigation is detailed in **Section 31.10.4**.
MD-LOT	387	12 May 2023, MD-LOT Scoping	"*The Scottish Ministers would also like to highlight from the NATS representation that the Proposed Development is likely to have a high operational impact on the Aberdeen Offshore sectors, and that further*	Infrastructure in the Goldeneye field was decommissioned and removed in 2021.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
		Opinion (Scottish Government, 2023b).	*analysis is required to determine whether the wind farm will affect the ability of helicopters to safely arrive at and depart from the Goldeneye and Buzzard oil fields to the southwest of the NE7 site. The Scottish Ministers recommend the Developer engages further with NATS on these points and advise that these impacts must be assessed, including mitigation, if necessary, in the EIA Report*."	Infrastructure in the Goldeneye field was decommissioned and removed in 2021. The OAA is beyond the nine nautical mile consultation zone for infrastructure within the Buzzard field.
MD-LOT	388	12 May 2023, MD-LOT Scoping Opinion (Scottish Government, 2023b).	"*The Scottish Ministers would also like to highlight that the Proposed Development is likely to generate an unacceptable level of clutter on the en-route air traffic operation at Prestwick Centre. The Scottish Ministers recommend the Developer engages further with NATS on this point and advises that this must be assessed in the EIA report, including mitigation*."	Radar clutter is assessed in **Section 31.10.4**. The Project has engaged with National Air Traffic Services (NATS) in relation to radar clutter in September 2025, and this will continue post-consent submission with the aim of delivering a suitable mitigation solution for radar impacts.
NATS	644	12 May 2023, MD-LOT Scoping Opinion Appendix 1: Consultation Responses & Advice (Scottish Government, 2023).	*"The proposed development falls within the assessment area of the following systems:* *En-route Surv - Alanshill Radar, Perwinnes Radar* *En-route Nav - None* *En-route AGA - None"*	Allanshill and Perwinnes radars are identified as receptors in Table 31.2 and assessed in **Section 31.10.4**.
NATS	645	12 May 2023, MD-LOT Scoping	"*Predicted Impact on Allanshill RADAR* *Using the theory as described in Appendix A and development specific propagation profile it has been determined that the portion of the*	Allanshill radar is assessed in **Section 31.10.4**. Consultation with NATS will continue with the aim of

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
		Opinion Appendix 1: Consultation Responses & Advice (Scottish Government, 2023).	*development that lies within 60nm of the radar is likely to consistently cause false primary plots to be generated. A reduction in the RADAR's probability of detection, for real aircraft, is also anticipated*."	delivering a suitable mitigation solution for radar impacts.
NATS	646	12 May 2023, MD-LOT Scoping Opinion Appendix 1: Consultation Responses & Advice (Scottish Government, 2023).	"*Predicted Impact on Perwinnes RADAR* *Using the theory as described in Appendix A and development specific propagation profile it has been determined that the portion of the development that lies within 60nm of the radar is likely to consistently cause false primary plots to be generated. A reduction in the RADAR's probability of detection, for real aircraft, is also anticipated*."	Perwinnes radar is assessed in **Section 31.10.4**. Consultation with NATS will continue with the aim of delivering a suitable mitigation solution for radar impacts.
NATS	647	12 May 2023, MD-LOT Scoping Opinion Appendix 1: Consultation Responses & Advice (Scottish Government, 2023).	"*Predicted Impact on Navigation Aids* *No impact is anticipated on NATS' navigation aids*."	This comment is acknowledged.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
NATS	648	12 May 2023, MD-LOT Scoping Opinion Appendix 1: Consultation Responses & Advice (Scottish Government, 2023).	"*Predicted Impact on the Radio Communications Infrastructure No impact is anticipated on NATS' radio communications infrastructure*."	This comment is acknowledged.
NATS	649	12 May 2023, MD-LOT Scoping Opinion Appendix 1: Consultation Responses & Advice (Scottish Government, 2023).	"*Zone NE7 lies within the area of responsibility of the two Aberdeen Offshore sectors. This zone lies beneath the northerly section of the North Sea track structure used by Aberdeen-based helicopters, although the shape of the zone limits the number of individual tracks that overfly this area due to its alignment. The tracks in this area are frequently used by helicopters operating between Aberdeen offshore installations such as Beryl, Brae and Piper*."	Effects on offshore helicopter operations are assessed in **Sections 31.9.2**, **31.10.2**, **and 31.11.2**.
NATS	650	12 May 2023, MD-LOT Scoping Opinion Appendix 1: Consultation Responses & Advice (Scottish	"*Helicopter pilots typically require 1000ft vertical separation from en-route obstacles. Pilots may elect to operate at an altitude high enough to provide suitable obstacle clearance but this may not always be possible restricting the tracks that are available and requiring a routing around the windfarm*."	Effects on offshore helicopter operations assessed in **Sections 31.9.2**, **31.10.2**, **and 31.11.2**.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
		Government, 2023).		
NATS	651	12 May 2023, MD-LOT Scoping Opinion Appendix 1: Consultation Responses & Advice (Scottish Government, 2023).	"*Helicopters inbound to the Piper oil field may be restricted on the point at which they can commence their descent. This in turn may create additional conflictions between such helicopters and those inbound to Aberdeen*."	The OAA is beyond the nine nautical mile consultation zone for infrastructure within the Piper field.
NATS	652	12 May 2023, MD-LOT Scoping Opinion Appendix 1: Consultation Responses & Advice (Scottish Government, 2023).	"*The turbines may also lie close to the Goldeneye/Buzzard fields to the southwest, but further analysis would be required to determine if the presence of turbines in NE7 would affect the ability of helicopters to safely arrive at and depart from these installations.* *The above means that this development is likely to have a 'High' operational impact and would therefore be unacceptable without further mitigation*."	Infrastructure in the Goldeneye field was decommissioned and removed in 2021. The OAA is beyond the nine nautical mile consultation zone for infrastructure within the Buzzard field.
NATS	653	12 May 2023, MD-LOT Scoping Opinion Appendix 1: Consultation Responses &	"*Prestwick Centre* *Without further mitigation the scale of the area affected by the predicted clutter would lead to an unacceptable impact on the en-route air traffic operation at Prestwick Centre*."	Radar clutter is assessed in **Section 31.10.4**. Consultation with NATS will continue with the aim of delivering a suitable mitigation solution for radar impacts.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
		Advice (Scottish Government, 2023).		
NATS	654	12 May 2023, MD-LOT Scoping Opinion Appendix 1: Consultation Responses & Advice (Scottish Government, 2023).	"*The proposed development has been examined by technical and operational safeguarding teams. A technical impact is anticipated, this has been deemed to be unacceptable without further work to identify and develop mitigation options*."	Radar clutter is assessed in **Section 31.10.4**. Consultation with NATS will continue with the aim of delivering a suitable mitigation solution for radar impacts. Effects on offshore helicopter operations are assessed in **Sections 31.9.2**, **31.10.2**, **31.11.2**. The Project is committed to ongoing and future engagement with NATS and helicopter operators to determine whether mitigation is necessary or appropriate.
MOD	679	12 May 2023, MD-LOT Scoping Opinion Appendix 1: Consultation Responses & Advice (Scottish Government, 2023).	"*Air Defence Radar* *Chapter 7.4 Military and civil aviation and telecommunications covers Military Aviation. Paragraphs 7.4.21 and 7.4.22 references the MOD's Air Defence (AD) Radars.* *Wind turbines have been shown to have detrimental effects on the operation of AD radar. These include the desensitisation of the radar in the vicinity of wind turbines, and the creation of "false" aircraft returns. The probability of the radar detecting aircraft flying over or in the locality of the turbines would be reduced, hence turbine proliferation within a specific locality can result in unacceptable degradation of the radar's operational integrity. This would reduce the RAF's ability to detect and manage aircraft in United Kingdom sovereign airspace, thereby preventing it from effectively performing its primary function of Air Defence of the United Kingdom.*	Impacts on RRH Buchan AD radar are assessed in **Section 31.10.4**. Consultation with the MOD will continue with the aim of delivering a suitable mitigation solution for Buchan AD radar prior to the O&M stage of the Project.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
			Within paragraph 7.4.21 of Chapter 7.4, it is stated that the nearest military air defence radar is located at Remote Radio Head (RRH) Buchan which is approximately 86.5km from the array."	
MOD	682	12 September 2023, MD-LOT Scoping Opinion Additional Consultation Response.	*"The MOD has undertaken an assessment based on 225 wind turbines at 350m to tip height using the Rochdale Envelope boundary co-ordinates. Turbines within the array area will be detectable to the AD Radar at RRH Buchan. The impact of the turbines on the AD radar at RRH Buchan will therefore need to be addressed through a suitable technical mitigation solution. It is the applicant's responsibility to provide a suitable technical mitigation solution to the MOD."*	Impacts on RRH Buchan AD radar are assessed and mitigation discussed in **Section 31.10.4**.
MOD	683	12 September 2023, MD-LOT Scoping Opinion Additional Consultation Response.	*"Mitigation to address the impact of the development on the AD Radar is considered at 7.4.32. It is stated that engagement with the MOD will continue throughout the application process, this is welcomed."*	This comment is acknowledged.
MOD	684	12 September 2023, MD-LOT Scoping Opinion Additional Consultation Response.	"*Air Traffic Control* *Chapter 7.4 Military and civil aviation and telecommunications covers Military Aviation. Paragraph 7.4.23 references the MOD's Air Traffic Control (ATC) Radars.* *This paragraph acknowledges there are no MOD Air Traffic Control (ATC) radars active or in use within the study area, the MOD agree with this based on the information available at this stage. Any variations to the number or height of the turbines proposed may change this position, however in its current form the MOD have no concerns*."	This comment is acknowledged.
MOD	685	12 September 2023, MD-LOT Scoping Opinion	"*Danger Areas* *Chapter 7.4 Military and civil aviation and telecommunications identifies nearby danger areas and airspace, and states that the Marramwind*	This comment is acknowledged.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
		Additional Consultation Response.	*Offshore Windfarm is outside these, the MOD agrees with this conclusion*."	
MOD	686	12 September 2023, MD-LOT Scoping Opinion Additional Consultation Response.	"*Military Low Flying* *The potential for the development to create physical obstructions to military low flying activities is acknowledged within Chapter 7.4 Military and civil aviation and telecommunications, paragraph 7.4.45 identifies potential effects on military aviation. and the requirement for military aviation charts to be updated is recognised in Table 7.4.5 (ID M-116). The MOD will request that a Requirement is added to any Development Consent Order that might be issued requiring the submission of information such as commencement dates, maximum turbine heights and the longitude and latitude of each wind turbine. This information is required to allow accurate charting of the development*."	MOD lighting requirements would be considered and followed when developing a Lighting Management Plan (M-100), as described in Error! Not a valid result for table.. As a point of clarity, the Project is in Scotland and Scottish waters and is therefore not subject to Development Consent Order (these being applicable to Nationally Significant Infrastructure Projects in England and Wales only). The stakeholder response is noted however, with the referenced information submitted with the marine licence and s.36 applications as required.
MOD	687	12 September 2023, MD-LOT Scoping Opinion Additional Consultation Response.	*"Table 7.4.5 (ID M-100) includes the MOD's lighting requirements for the development. It is welcomed that the turbines will be fitted with infra-red lighting in combination with the ANO's lighting requirement. The MOD will request that the aviation warning lighting requirements is added as a Requirement to any Development Consent Order that might be issued."*	As noted for ID 686, projects in Scottish waters are not subject to Development Consent Order; however, the MOD's lighting requirements would be submitted within a Lighting Management Plan (M-100) as required.
MOD	690	12 September 2023, MD-LOT Scoping	"*Highly Surveyed Routes* *The MOD has highly surveyed routes within the locality of the development area which maybe relevant to the installation of wind*	It was confirmed via email on 12 November 2024 that the MOD has no concerns regarding highly

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
		Opinion Additional Consultation Response.	*turbines, export cables & associated infrastructure. These routes are retained by the MOD to support national defence requirements and are not defined in the public domain. Highly surveyed routes must not be obstructed or impeded by offshore developments such as wind turbines. At this time, we are unable to advise if the development will impede any highly surveyed routes in the area. An assessment to determine any impact has been requested and we will share the results with you as soon as we are able to*."	surveyed routes for the MarramWind Offshore Wind Farm.
MOD	691	12 September 2023, MD-LOT Scoping Opinion Additional Consultation Response.	"*Landfall and Onshore* *Maps provided within Appendix 1 a (Chapter 1 – 5 Section 5.8 and Chapter 6 Sections 6.1 – 6.3) show the extent of the onshore and landfall area of interest. Parts of this onshore area of interest are covered by statutory safeguarding zones surrounding RAF Buchan and Crimmond. As the proposal matures MOD should be consulted so any impact on these safeguarded MOD assets can be identified*."	The onshore assessment in **Volume 3, Appendix 31.1** confirms that infrastructure would not infringe safeguarding zones. Impacts of onshore infrastructure on Buchan and Crimond are scoped out of assessment in **Table** 31.4, but this would be re-assessed with MOD as the proposal matures.
NATS		25 September 2025, email response	The stakeholder email is abbreviated as follows: The Perwinnes impact is at the limit of viability for detection analysis results. Radar line of sight at 350m from Perwinnes extends to 65.5nm. The Perwinnes' detection range may be slightly less, but it would align with the SW corner of the MarramWind OAA. Weather can influence radio propagation in the marine environment. Effects that may be referred to as ducting or anaprop lead to variability in detection levels for turbines that sit just over the horizon. Further future detail on turbine dimensions and layout, coupled with further engagement with Aberdeen Air Traffic Control in relation to "intermittent" clutter generation, particularly near to routes to the	Radar clutter is assessed in **Section 31.10.4**. Consultation with NATS will continue with the aim of delivering a suitable mitigation solution for radar impacts.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
			Goldeneye and Piper fields will allow appropriate mitigations to be agreed for the Allanshill clutter (which itself should be easier to find if the Perwinnes performance is reliable.	

31.4 Scope of the assessment

31.4.1 Overview

31.4.1.1 This Section sets out the scope of the EIA for civil and military aviation. This scope has been developed as the Project's design has evolved and responds to stakeholder feedback received to date, as set out in **Section 31.3**.

31.4.2 Spatial scope and study area

31.4.2.1 In considering the spatial scope of the civil and military aviation study area, the over-riding factor is the potential for WTGs within the OAA to have an impact on civil and military radars, taking into account required radar operational ranges. In general, Primary Surveillance Radars (PSRs) installed on civil and military airfields have an operational range of between 40 nautical miles (nm) (which is equivalent to 74 kilometres (km)) and 60nm (equivalent to 111km). All radar equipped airfields within 60nm (equivalent to 111km) of the OAA are therefore included in the study area.

31.4.2.2 En-route radars operated by NATS (En-Route) plc (NERL), and military AD radars are required to provide coverage at ranges in excess of 60nm (111km) and so all such radars with potential Radar Line of Sight (RLoS) of WTGs in the OAA are also included in the study area.

31.4.2.3 The spatial scope of the civil and military aviation assessment includes the Project's Red Line Boundary and comprises a 9nm (16.7km) Zone of Influence around the OAA, which is extended to the UK mainland to include the NERL radar facility at Allanshill to the west and Aberdeen Airport to the south, as depicted in **Volume 2, Figure 31.1: Airports and radars within the civil and military aviation study area**. This has formed the basis of the study area described in this Section.

31.4.2.4 Criteria used to identify receptors within the study area are detailed in the following paragraphs.

Civil aerodromes

31.4.2.5 CAP 764: Policy and Guidelines on Wind Turbines (CAA, 2016) states the distances from various types of aerodromes for WTG developments where consultation should take place. These distances include:

- aerodromes with a surveillance radar – 30km;
- licensed aerodromes where the WTGs will lie within airspace coincidental with any published Instrument Flight Procedure;
- non-radar equipped licensed aerodromes with a runway of 1,100m or more – 17km;
- non-radar equipped licensed aerodromes with a runway of less than 1,100m – 5km;
- non-radar equipped unlicensed aerodromes with a runway of more than 800m – 4km;
- non-radar equipped unlicensed aerodromes with a runway of less than 800m – 3km;
- gliding sites – 10km; and
- other aviation activity such as parachute sites and microlight sites within 3km.

31.4.2.6 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 always be objected to. For example, aerodromes may utilise their radars at ranges considerably in excess of 30km.

31.4.2.7 As well as examining the technical impact of WTGs on 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, 2022) to determine whether a proposed development has potential to breach obstacle clearance criteria at any aerodromes.

Ministry of Defence facilities

31.4.2.8 It is necessary to take into account the aviation and AD activities of the MOD. This includes:

- MOD airfields and other defence sites, both radar and non-radar equipped;
- MOD AD radars; and
- MOD Danger Areas (DAs) for both aviation and non-aviation activities.

NATS (En-Route) plc facilities

31.4.2.9 It is necessary to consider the possible effects of WTGs upon NERL's en-route electronic infrastructure, which is a UK-wide network of primary and secondary radars and navigation facilities.

Other aviation activities

31.4.2.10 Other aviation activities under consideration include:

- general military low flying training operations; and
- military and civilian 'off-route' fixed-wing and helicopter operations, Search and Rescue (SAR) missions and offshore helicopter operations in support of offshore wind developments and the oil and gas industry.

Meteorological radio facilities

31.4.2.11 WTGs have the potential to adversely impact meteorological radio facilities such as weather radar. The Met Office must be consulted when wind turbine proposals are within a 20km radius zone of any of their UK weather radar sites. To assist developers, maps of relevant consultation zones are provided online by the Met Office.

31.4.2.12 Offshore WTGs that are beyond 20km from weather radar sites can still have an impact due to their size. For this reason, any weather radars with potential RLoS of WTGs in the OAA are under consideration.

31.4.3 Temporal scope

31.4.3.1 It is anticipated that the construction of the Project will commence in 2030, with the first phase becoming fully operational by 2037. It is anticipated that the second phase of the Project would become fully operational by 2040 and the third phase by 2043. The operational lifetime of the Project for each phase is expected to be 35 years.

31.4.4 Identified receptors

31.4.4.1 The spatial and temporal scope of the assessment enables the identification of receptors that may experience an effect as a result of the Project. The receptors identified that may experience likely significantly effects for civil and military aviation are outlined in **Table 31.2**.

Table 31.2 Identified receptors requiring assessment for civil and military aviation

Receptor group	Receptors included within group
Civil aerodromes	Aberdeen Airport Longside Airfield
MOD facilities	RRH Buchan AD PSR Defence High Frequency Communications Service (DHFCS) Crimond
NERL facilities	Allanshill PSR Perwinnes PSR ATS
Other aviation activities	Offshore helicopter operations SAR missions Military low flying training operations
Meteorological radio facilities	Hill of Dudwick weather radar

31.4.5 Potential effects

31.4.5.1 Potential effects on civil and military aviation receptors that have been scoped in for assessment are summarised in **Table 31.3**.

Table 31.3 Potential effects for civil and military aviation

Receptor	Activity or impact	Potential effect
Construction stage		
Offshore helicopter operations **SAR missions** **Military low flying training operations**	Impacts on civil and military aviation from the creation of offshore aviation obstacles.	Risk of collision. Extended routes to avoid obstacles. Reduced access to offshore oil and gas platforms.
Longside Airfield	Impacts of onshore infrastructure on civil and military aviation.	Disruption of flying activities. Bird strike hazard.
Operation and maintenance stage		
Offshore helicopter operations **SAR missions** **Military low flying training operations**	Impacts on civil and military aviation from the creation of offshore aviation obstacles.	Risk of collision. Extended routes to avoid obstacles. Reduced access to offshore oil and gas platforms.

Receptor	Activity or impact	Potential effect
Longside Airfield	Impacts of onshore infrastructure on civil and military aviation.	Disruption of flying activities.
RRH Buchan AD PSR **Allanshill PSR** **Perwinnes PSR** **NERL ATS**	Impacts from WTGs on civil and military PSRs.	WTGs that are detected by PSRs can generate clutter on radar displays which can mask genuine aircraft targets and can create shadowed areas beyond the WTGs. These potential impacts could affect the safe provision of an ATS or compromise the MOD's AD capability.
Decommissioning stage		
Offshore helicopter operations **SAR missions** **Military low flying training operations**	Impacts on civil and military aviation from offshore aviation obstacles.	Risk of collision. Extended routes to avoid obstacles. Reduced access to offshore oil and gas platforms.
Longside Airfield	Impacts of onshore infrastructure on civil and military aviation.	Disruption of flying activities. Bird strike hazard.

31.4.6 Effects scoped out of assessment

31.4.6.1 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 professional judgement 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 31.4**.

Table 31.4 Activities or effects scoped out of assessment

Activity or impact	Rational for scoping out
Impacts from WTGs on civil and military PSRs (construction and decommissioning).	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. Similarly, tall construction vessels and cranes that are in RLoS would not be moving fast enough to generate PSR clutter. During the decommissioning stage the blades of WTGs would cease rotating, therefore the impact on PSRs would gradually reduce until the last WTG ceases operation. Any mitigations would remain in place until the blades of the last WTG stop rotating. There would be no other specific impacts on PSRs during the construction or decommissioning stages.

Activity or impact	Rational for scoping out
Impacts from WTGs on civil and military Secondary Surveillance Radars (SSRs) (construction, O&M and decommissioning).	NATS do not consider the impact of WTGs on SSR to be material or relevant for WTGs that are beyond approximately 28km from their SSR facilities. Furthermore, CAP 764 states that WTG effects on SSR "…*are typically only a consideration when the turbines are located very close to the SSR i.e., less than 10km*". The nearest SSR facility, at Allanshill, is 91km from the OAA and would not be adversely impacted by WTGs.
Impacts from WTGs on weather radars (construction, O&M and decommissioning).	The closest Met Office weather radar to the OAA is at Hill of Dudwick, 98km to the south-west. WTGs that are in RLoS and in the elevation scan of a weather radar can have an adverse impact, blocking radar data and creating clutter that obscures the detection of real precipitation signals. Modelling, as detailed in **Volume 3, Appendix 31.1**, shows that WTGs in the OAA would be in RLoS. However, all WTGs would be below the lowest elevation scan and would therefore not have any detrimental impacts.
Impacts of onshore infrastructure on MOD facilities, NERL facilities and meteorological radio facilities (construction, O&M and decommissioning).	In its response to Aberdeenshire Council's Scoping Opinion (see **Table 31.1**), the MOD stated that the land identified in the submitted application falls within the statutory safeguarding zones surrounding RRH Buchan, but after review confirmed that it had no concerns regarding the onshore aspect of the proposal. The MOD noted that a further assessment will be required once the onshore element design becomes more mature. In its response to MD-LOT's Scoping Opinion (see **Table 31.1**), the MOD stated that parts of the onshore area of interest are covered by statutory safeguarding zones surrounding Buchan and Crimond and that consultation is required to identify any impacts on these safeguarded MOD assets as the proposal matures. The NATS MD-LOT Scoping Opinion response (see **Table 31.1**) states that no impact is anticipated on NATS' navigation aids or radio communications infrastructure. **Volume 3, Appendix 31.1** includes an assessment of the potential for onshore infrastructure to impact the performance of nearby radars and aviation radio navigation aids. Analysis of applicable safeguarded zones shows that onshore infrastructure would have no impact on DHFCS Crimond, RRH Buchan AD PSR, NERL Allanshill PSR or Hill of Dudwick weather radar.
Impacts on MOD highly surveyed routes (construction, O&M and decommissioning).	The MOD retains highly surveyed routes that are not defined in the public domain in order to maintain national defence requirements. These routes must not be obstructed by offshore developments such as WTGs or offshore platforms. The MOD confirmed in November 2024 that it has no concerns regarding the Project and highly surveyed routes, as detailed in **Table 31.1**.
Impacts on MOD DAs.	The Fast Jet Area North DA EGD901 is situated above the OAA. However, the vertical distance between the maximum height of WTGs and the lower limit of the DA means there is no impact pathway between Project obstacles and DA activities. The MOD agreed with this conclusion in its MD-LOT Scoping Opinion response, as detailed in **Table 31.1.**

31.5 Methodology for baseline data gathering

31.5.1 Overview

31.5.1.1 Baseline data collection has been undertaken to obtain information over the study area described in **Section 31.4: Scope of the assessment**. The current and future baseline conditions are presented in **Section 31.6: Baseline conditions.**

31.5.1.2 No site survey work has been completed in relation to civil and military aviation.

31.5.2 Desk study

31.5.2.1 The data sources that have been collected and used to inform this civil and military aviation assessment are summarised in **Table 31.5**.

Table 31.5 Data sources used to inform the civil and military aviation chapter

Source	Date	Summary	Coverage of study area
CAP 032: UK AIP, CAA	Accessed April 2025.	The UK AIP is the publicly available official source of information on facilities, services, rules, regulations and restrictions in UK airspace.	Full coverage of study area.
UK Military AIP, MOD	Accessed April 2025.	The UK Military AIP is the publicly available primary source of aeronautical information and flight procedures at all UK military aerodromes.	Full coverage of study area.
Protected Radar List, Office of Communications	Accessed March 2025.	A publicly available list of the locations and antenna heights of UK civil and military PSRs.	Full coverage of study area.
Wind farm self-assessment maps, NATS	Accessed March 2025.	Free online resources provided by NATS to enable developers to evaluate potential impacts of wind turbines on their en-route electronic infrastructure.	Full coverage of study area.
Offshore infrastructure data, North Sea Transition Authority (NSTA)	Accessed April 2025.	Regularly updated datasets published by the NSTA that are publicly available through the NSTA's Open Data platform.	Full coverage of study area.
Met Office planning maps, Met Office	Accessed April 2025.	Publicly available online maps of consultation zones for safeguarding UK weather radar sites.	Full coverage of study area.

31.5.3 Data limitations

31.5.3.1 There are no known data limitations at the time of this study relating to civil and military aviation that affect the robustness of the assessment of this EIA Report.

31.6 Baseline conditions

31.6.1 Current baseline

31.6.1.1 A summary of the civil and military aviation baseline environment is provided in this Section. Further details of the airspace analysis undertaken to develop the civil and military aviation baseline is provided in **Volume 3, Appendix 31.1**. **Volume 3, Appendix 31.1** also includes information on the computer modelling used to determine which radars may have RLoS of WTGs within the OAA.

Civil aviation

31.6.1.2 The Project is within the Scottish Flight Information Region (FIR), which is airspace regulated by the UK CAA. The Scottish FIR is adjacent to the London FIR, 335km south of the OAA, and the Polaris FIR, which is 152km northeast of the OAA and regulated by CAA Norway. Some of the Scottish FIR airspace is delegated to Norway. This area, known as North Sea Area II, lies 115km east of the OAA at its closest point.

31.6.1.3 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 five classes of airspace: specifically, A, C, D, E and G. The first four are controlled airspace classes while Class G is uncontrolled. Within controlled airspace, aircraft are monitored and instructed by ATC, whereas in uncontrolled airspace 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.

31.6.1.4 The airspace above the OAA is uncontrolled Class G airspace, extending vertically from sea level to Flight Level (FL) 195 (approximately 19,500 feet (ft) above mean sea level (amsl)). (Note that in aviation “feet” are the standard unit for measuring altitude and are directly related to Flight Levels). This airspace is used predominantly for low-level flight operations and generally by aircraft flying under Visual Flight Rules (VFR).

31.6.1.5 Aircraft operate under one of two flight rules: VFR or Instrument Flight Rules (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.

31.6.1.6 Laterally, the closest controlled airspace to the OAA is the Moray Control Area (Moray CTA). The Moray CTA comprises CTAs 1 to 17 and is Class E airspace, apart from CTAs 14 and 15 which are Class C. Moray CTA 3 lies approximately 38km west of the OAA, Moray CTA 2 lies 26km south of the OAA and Moray CTA 15 lies 20km to the southeast.

31.6.1.7 Moray CTAs 2 and 3 are Transponder Mandatory Zones (TMZs). 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.

31.6.1.8 Airspace in the vicinity of the Project is depicted in **Volume 2, Figure 31.2: Existing civil and military airspace environment**.

31.6.1.9 A chart of Area Minimum Altitudes (AMAs) across the London and Scottish FIRs is published in the AIP which provides a minimum vertical obstacle clearance of 1,000ft within specified areas formed by lines of latitude and longitude in half degree steps. The OAA is within an AMA area of 1,400ft amsl, which assumes that all obstacle heights within the area do not exceed 400ft (121.9m) amsl.

31.6.1.10 The nearest major UK airport to the OAA is Aberdeen Airport, which is 123km to the southwest (**Volume 2, Figure 31.1**). Aberdeen Airport is Scotland's third busiest airport and the main heliport for offshore helicopter operations in the northern North Sea.

31.6.1.11 Longside Airfield is an unlicensed airstrip around 3km west of Peterhead and is the home of Buchan Aero Club. It has an east to west paved runway of 500m in length. The Onshore Red Line Boundary crosses the extended runway centreline approximately 200m east of the runway 28 threshold (**Volume 2, Figure 31.1**). The runway 28 threshold marks the beginning of the portion of runway usable for aircraft landing in the westerly direction.

31.6.1.12 NERL provides en-route civil ATS within the Scottish FIR and operates a network of radar facilities providing en-route information on airborne traffic for both civil and military ATC units. The closest NERL radars to the OAA are based at Allanshill, 91km to the southwest, and Perwinnes, 120km to the south-southwest (**Volume 2, Figure 31.1**). NERL radar facilities are combined PSR and SSR systems. Perwinnes radar is also the ATC radar for Aberdeen Airport.

31.6.1.13 The NERL Allanshill and Perwinnes radar sites lie 22km northwest and 34km south-southwest respectively of the Onshore Red Line Boundary.

Military aviation

31.6.1.14 The OAA is situated beneath the Fast Jet Area North DA, EGD901 which, when active, has vertical limits from FL245 to FL550 (approximately 24,500 to 66,000ft amsl). High energy manoeuvres, ordnance, munitions and explosives activities take place within EGD901.

31.6.1.15 The southern half of the OAA lies beneath Air to Air Refuelling Area (AARA) Area 04. AARA Area 04 is permanently available to military traffic and has vertical limits of FL70 to FL240 (approximately 7,000 to 24,000ft amsl).

31.6.1.16 EGD901 and AARA Area 04 are depicted in **Volume 2, Figure 31.2**.

31.6.1.17 There are no PSR-equipped military airfields within the study area. The closest such airfield is Royal Air Force Lossiemouth, 154km to the west-southwest of the OAA.

31.6.1.18 The nearest MOD AD radar to the OAA is based at RRH Buchan, 86km to the southwest (**Volume 2, Figure 31.1**). RRH Buchan also lies 5km south-southeast of the Onshore Red Line Boundary.

31.6.1.19 Another MOD facility in the vicinity of the Onshore Red Line Boundary is the military communication site known as DHFCS Crimond, 6km to the north-northwest.

Helicopter main routing indicators

31.6.1.20 The OAA is within the Aberdeen Offshore Safety Area (OSA), airspace extending from the sea surface to FL100 (approximately 10,000ft amsl). The OSA is the busiest airspace in the vicinity in terms of offshore helicopter traffic and contains a network of offshore routes over the North Sea that are flown by helicopters in support of oil and gas installations. These routes are published on charts as Helicopter Main Routing Indicators (HMRIs) and, together with the OSA, alert other airspace users of the potential for frequent low-level helicopter traffic. The routes have no lateral dimensions, however there should be no obstacles within 2nm (3.7km) of the route centreline.

31.6.1.21 The OAA is crossed by HMRIs 044, 047, 050, 053 and 056 and is within 2nm (3.7km) of the centreline of HMRI 059. All HMRIs in the vicinity of the OAA are depicted in **Volume 2, Figure 31.3: HMRIs and oil and gas infrastructure in the vicinity of the Option Agreement Area**.

Offshore helidecks

31.6.1.22 To help achieve a safe operating environment, a 9nm (16.7km) consultation zone for planned obstacles exists around offshore helicopter destinations. Within 9nm (16.7km), obstacles such as WTGs can impact upon the feasibility of helicopters to safely fly in low visibility or under missed approach procedures at the associated helideck site. The helideck at the Golden Eagle production, utilities and quarters (PUQ) platform is 5.0nm (9.2km) southwest of the OAA.

Search and Rescue

31.6.1.23 There are ten helicopter SAR bases around the UK with Bristow Helicopters providing helicopters and aircrew. The nearest SAR base is at Inverness Airport, 200km west-southwest of the OAA.

Met Office weather radars

31.6.1.24 The closest Met Office weather radar to the OAA is located at Hill of Dudwick in Aberdeenshire, 98km southwest of the OAA (**Volume 2, Figure 31.1**). Hill of Dudwick weather radar also lies 11km southwest of the Onshore Red Line Boundary.

31.6.2 Future baseline

31.6.2.1 The aviation industry is under long-term pressure to reduce its contribution to climate change, but this is not considered to have significant implications for the civil and military aviation baseline parameters. An increasing amount of offshore oil and gas infrastructure in the North Sea is being decommissioned, which will potentially reduce the volume of helicopter traffic to and from offshore platforms. However, this may be offset by helicopter traffic associated with new renewable activities, and an increase in low-level autonomous drone traffic can be foreseen.

31.7 Basis for the EIA Report

31.7.1 Maximum design scenario

31.7.1.1 The process of 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 planning application, marine licences applications and s.36 consent.

31.7.1.2 The assessment of the maximum adverse scenario for each receptor establishes the maximum potential adverse effect and as a result effects of greater adverse significance would not arise should any other scenario (as described in **Chapter 4: Project Description**) to that assessed within this Chapter be taken forward in the final scheme design.

31.7.1.3 The maximum design scenario parameters that have been identified to be relevant to civil and military aviation are outlined in **Table 31.6** and are in line with the project design envelope (**Chapter 4: Project Description**).

Table 31.6 Maximum design scenario for impacts on civil and military aviation

Impact / activity	Maximum design scenario parameter	Justification
Construction		
Impact C1: Impacts on civil and military aviation from the creation of offshore aviation obstacles	• maximum of 225 WTGs; • maximum blade tip height of 350m amsl.; • maximum of four offshore substations platforms with a maximum topside height of 100m above LAT (including mast and lighting conductor and cranes); • maximum of two reactive compensation platforms (RCPs) with a maximum topside height of 100m above lowest astronomical tide (LAT) (including mast and lighting conductor and cranes); • heavy lift vessel; and • offshore construction stage of 12 years.	Maximum physical obstruction to aviation operations due to the height and number of above sea level infrastructure. Maximum duration of impacts over the offshore construction stage.
Impact C2: Impacts of onshore infrastructure on civil and military aviation	• maximum height of construction equipment such as mobile cranes and excavators; • three onshore substations up to 30m in height; • maximum height of 17.5m for substation external infrastructure; and • onshore construction stage of nine years.	Maximum physical obstruction to aviation operations due to the height of construction equipment and substation infrastructure. Maximum duration of impacts over the onshore construction stage.
Operation and maintenance		
Impact O1: Impacts on civil and military aviation from the creation of offshore aviation obstacles such as WTGs during operation	• maximum of 225 WTGs; • maximum blade tip height of 350m amsl; • maximum of four offshore substations platforms with a maximum topside height of 100m above LAT (including mast and lighting conductor and cranes); • maximum of two RCPs with a maximum topside height of 100m above LAT (including mast and lighting conductor and cranes); and • operational lifetime of 35 years for each phase of the Project.	Maximum physical obstruction to aviation operations due to the height and number of above sea level infrastructure. Maximum duration of impacts over the operational lifetime.

Impact / activity	Maximum design scenario parameter	Justification
Impact O2: Impacts of onshore infrastructure on civil and military aviation	• three onshore substations up to 30m in height; • maximum height of 17.5m for substation external infrastructure; and • operational lifetime of 35 years for each phase of the Project.	Maximum physical obstruction to aviation operations due to the height of substation infrastructure. Maximum duration of impacts over the operational lifetime.
Impact O3: Impacts from WTGs on civil and military radar	• maximum of 225 WTGs; • maximum blade tip height of 350m amsl; and • operational lifetime of 35 years for each phase of the Project.	Maximum height and number of WTGs with potential for interference with radar systems. Maximum duration of impacts over the operational lifetime.
Decommissioning		
Impact D1: Impacts on civil and military aviation from offshore aviation obstacles	• maximum of 225 WTGs; • maximum blade tip height of 350m amsl; • maximum of four offshore substations platforms with a maximum topside height of 100m above LAT (including mast and lighting conductor and cranes); • maximum of two RCPs with a maximum topside height of 100m above LAT (including mast and lighting conductor and cranes); • heavy lift vessel; • construction support vessels equipped with large cranes; and • decommissioning stage (programme to be developed post-consent but pre-construction).	Maximum physical obstruction to aviation operations due to the height and number of above sea level infrastructure. Maximum duration of impacts over the decommissioning stage.
Impact D2: Impacts of onshore infrastructure on civil and military aviation	• maximum height of construction equipment such as mobile cranes and excavators; • three onshore substations up to 30m in height; • maximum height of 17.5m for substation external infrastructure; and • decommissioning stage of up to 9 years.	Maximum physical obstruction to aviation operations due to the height of construction equipment and substation infrastructure. Maximum duration of impacts over the onshore decommissioning stage.

31.7.2 Embedded environmental measures

31.7.2.1 As part of the Project design process, a number of embedded environmental measures have been adopted to reduce the potential for adverse impacts on civil and military aviation. These embedded environmental measures have evolved over the development process as the EIA has progressed and in response to consultation.

31.7.2.2 These 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 these embedded environmental measures, and also to various standard sectoral practices and procedures, they are considered inherently part of the design of the Project and are set out in the EIA Report.

31.7.2.3 **Table 31.7** sets out the relevant embedded environmental measures within the design and how these affect the civil and military aviation assessment.

31.7.2.4 Further detail on the embedded environmental measures is provided in **Volume 3, Appendix 5.2: Commitments Register**, which sets out how and where particular embedded environmental measures will be implemented and secured.

Table 31.7 Relevant civil and military aviation embedded environmental measures

ID	Environmental measure proposed	Project stage measure introduced	How the environmental measures will be secured	Relevance to civil and military aviation assessment
M-045	Compliance with MCA MGN 654 (MCA, 2021) and its annexes where applicable. MGN 654 includes the completion of a Search and Rescue Checklist.	Scoping Amended at EIA Report.	s.36 conditions and marine licences conditions.	A SAR Checklist will ensure SAR resources have the required Project details for emergency situations.
M-047	Appropriate marking of the Project on Admiralty and aeronautical charts. This will include provision of the positions and heights of structures to the UKHO, Civil Aviation Authority, Ministry of Defence and Defence Geographic Centre.	Scoping Amended at EIA Report.	s.36 conditions and marine licences conditions.	Charting of the Project will alert aviation stakeholders to the presence of new offshore obstacles.
M-063	A CEMP will be implemented by the contractor in accordance with Volume 4: Outline Construction Environmental Management Plan. The contractor will ensure that the relevant environmental measures within the CEMP and health and safety procedures are implemented. The CEMP identifies the project management structure roles and responsibilities with regard to managing and reporting on the environmental impact of the construction stage.	Scoping Amended at EIA Report.	Planning conditions and CEMP.	The CEMP will be used to minimise impacts of construction on Longside Airfield.
M-100	A Lighting Management Plan (LMP) will be agreed and implemented in consultation with the Civil Aviation Authority (CAA), MCA and MOD. This will contain specific requirements in terms of military and civil aviation lighting to be installed on WTGs incorporating the requirements of CAP393 and other relevant legislation and guidance.	Scoping	s.36 conditions and marine licences conditions.	Lighting increases the visibility of offshore obstacles for aviation stakeholders.

ID	Environmental measure proposed	Project stage measure introduced	How the environmental measures will be secured	Relevance to civil and military aviation assessment
M-101	Any temporary obstacles associated with offshore infrastructure (such as WTGs and platforms) that are of more than 91.4 m in height (e.g. construction infrastructure such as cranes and/or meteorological masts) are to be identified to military and civil aviation aircrews by notifying the Notices to Aviation (NOTAM) system.	Scoping	s.36 conditions and marine licences conditions.	NOTAM will alert aircrew commanders to the presence of temporary offshore obstacles.
M-106	The development of and adherence to a Decommissioning Programme. The Decommissioning Programme will outline measures for the decommissioning of the Project. The Decommissioning Programme would be submitted prior to construction commencing to MD-LOT and approved by Scottish Ministers prior to construction.	Scoping Amended at EIA Report.	Required under Sections 105 (Energy Act 2004) and marine licences consent conditions.	The development and adherence to a Decommissioning Programme will ensure that the process of decommissioning the Project minimises civil and military aviation effects.
M-116	The CAA will be notified of the confirmed locations, heights and lighting status of the WTGs and platforms within the offshore infrastructure, including estimated and actual dates of construction, the maximum heights of any construction equipment to be used. This will be undertaken at least two months prior to the start of construction.	Scoping	s.36 conditions and marine licences conditions.	Notification to the CAA will ensure the timely dissemination of obstacle information to aviation stakeholders.
M-120	An **Outline Construction Method Statement** (CMS) has been submitted with this Application (**Volume 4**). The Final CMS will be completed prior to construction commencing and submitted to MD-LOT for approval. The Final CMS will include: a) details of the commence dates, duration and phasing of key elements of construction, working areas, the construction procedures and good working practices; b) details of the roles and responsibilities; and c) details of how the construction related mitigation step proposed are to be delivered.	EIA Report	s.36 conditions and marine licences conditions.	The Construction Method Statement will provide details on construction dates and durations to raise awareness of construction activities for aviation stakeholders.

ID	Environmental measure proposed	Project stage measure introduced	How the environmental measures will be secured	Relevance to civil and military aviation assessment
M-122	Development of and adherence to a Offshore Operations and Maintenance Plan, which will confirm the Project's operations and maintenance activities. This will be submitted to MD-LOT for approval post-consent.	EIA Report	s.36 conditions and marine licences conditions.	The Final OOMP will enable safe SAR operations for emergency situations.

31.8 Methodology for EIA Report

31.8.1 Introduction

31.8.1.1 The Project-wide approach to assessment is set out in **Chapter 5: Approach to the EIA.** Whilst this has informed the approach that has been used in this civil and military aviation assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of the civil and military aviation assessment.

31.8.2 Significance evaluation methodology

Overview

31.8.2.1 The significance level attributed to each effect has been assessed based on the value of the affected receptor and the magnitude of change resulting from the Project. The level of significance has then been determined by the combination of value and magnitude.

31.8.2.2 The terms used to define receptor sensitivity or value and the magnitude of change affecting the receptor for civil and military aviation are based on those described in further detail in **Chapter 5: Approach to the EIA**.

Value of receptor

31.8.2.3 The value or sensitivity criteria for civil and military aviation are detailed in **Table 31.8**. In determining value, assessments consider the receptor's economical value, vulnerability to impact from the Project and recoverability.

Table 31.8 Value or sensitivity criteria for civil and military aviation receptors

Value or sensitivity	Description
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 Project and / or recoverability is slow and / or costly.
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 Project and / or has moderate to high levels of 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 Project and / or has high recoverability.
Very low.	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 Project and / or has high recoverability.

Magnitude of changes

31.8.2.4 The magnitude criteria for civil and military aviation are detailed in **Table 31.9**. In determining magnitude, assessments consider the spatial extent, duration, frequency and reversibility of impact.

Table 31.9 Magnitude of impact criteria for civil and military aviation receptors

Magnitude	Description
High	Total loss of ability to carry on activities and / or impact is of extended physical extent and / or long-term duration (for instance, total life of Project) and / or frequency of repetition is continuous and / or effect is not reversible for Project.
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 (for instance, operational stage) and / or frequency of repetition is medium to continuous and / or effect is not reversible for Project phase.
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 (for instance, construction stage) and / or frequency of repetition is low to continuous and / or effect is not reversible for Project phase.
Very low	Very slight change from baseline condition and / or physical extent of impact is negligible and / or short-term duration (for instance, less than two years) and / or frequency of repetition is negligible to continuous and / or effect is reversible.

Significant evaluation

31.8.2.5 By assigning and combining sensitivity and magnitude criteria, overall effect significance upon civil and military aviation receptors can be determined, as shown in **Table 31.10**.

Table 31.10 Significance of effect matrix for civil and military aviation

		Magnitude of change			
		High	**Medium**	**Low**	**Negligible**
Value / Sensitivity	**High**	**Major (Significant)**	**Major (Significant)**	**Moderate (Potentially significant)**	**Minor (Not significant)**
	Medium	**Major (Significant)**	**Moderate (Potentially significant)**	**Minor (Not significant)**	**Minor (Not significant)**
	Low	**Moderate (Potentially significant)**	**Minor (Not significant)**	**Minor (Not significant)**	**Negligible (Not significant)**
	Very low	**Minor (Not significant)**	**Minor (Not significant)**	**Negligible (Not significant)**	**Negligible (Not significant)**

31.8.2.6 During the assessment of effects for each identified receptor, the value in **Table 31.8** will be combined with the magnitude of change from **Table 31.9** to produce an overall significance rating based on the evaluation matrix shown in **Table 31.10**. As a general rule, **Major** and **Moderate** effects are considered to be **Significant** and **Minor** and **Negligible** effects are considered to be **Not Significant**. However, professional judgement is applied, where appropriate, to determine significance of effect. Where effects are assessed, according to the matrix in **Table 31.10** to be **Potentially Significant** in EIA terms, professional judgement is applied to determine whether they are **Significant** or **Not Significant**.

31.9 Assessment of effects: construction stage

31.9.1 Introduction

31.9.1.1 This Section provides an assessment of the effects for civil and military aviation from the construction of the offshore and onshore elements of the Project.

31.9.1.2 The assessment methodology set out in **Section 31.8** has been applied to assess effects to civil and military aviation from the Project.

31.9.2 Impact C1: impacts on civil and military aviation from the creation of offshore aviation obstacles

Overview

31.9.2.1 The maximum assessment scenario relating to the impacts on civil and military aviation from the creation of offshore aviation obstacles is presented in **Table 31.6**. Where predicted effects are identified, an assessment of the magnitude of change for each effect has been completed based on the methodology provided in **Section 31.8.2**. The magnitude of change, and hence the significance of potential effects has been assessed on the

assumption that the embedded environmental measures from **Table 31.7** have been implemented as part of the Project.

31.9.2.2 Construction of the wind farm would involve tall crane vessels and the installation of infrastructure above sea level that may pose a physical obstruction to low flying aircraft utilising the airspace in the vicinity, potentially increasing the risk of obstacle collision or requiring aircraft to fly extended routes to avoid obstacles. From a starting point of no offshore infrastructure, the infrastructure in **Table 31.6** would gradually be installed over a period of 12 years.

31.9.2.3 Specifically, permanent or temporary obstacles could impact the following receptors:

- offshore helicopter operations;
- SAR missions; and
- military low flying training operations.

Sensitivity or value of receptor

31.9.2.4 The receptors are deemed to be of high value, but of low vulnerability and high recoverability. The overall sensitivity of the receptors is therefore considered to be **medium**.

Magnitude of impact

31.9.2.5 As detailed in **Table 31.7**, potential impacts on flying activities in the vicinity of the OAA would be mitigated through the development of an Outline Lighting and Marking Plan in agreement with key aviation stakeholders (M-100) and through the provision of the positions and heights of structures to the CAA, MOD and DGC to enable appropriate marking and updating of aeronautical charts (M-047 and M-116). The Outline Lighting and Marking Plan would also cover the lighting and marking of construction equipment such as tall cranes. Temporary obstacles associated with offshore infrastructure, such as the towing of floating WTGs to the OAA, would be notified to enable promulgation to civil and military aviation aircrews (M-101).

31.9.2.6 The lighting of WTGs and the final WTG layout would be compatible with the SAR requirements detailed in MGN 654 (MCA, 2021) and a SAR Checklist would be completed (M-045).

31.9.2.7 Commercial Air Transport (CAT) helicopters utilising HMRIs that route over the OAA would have to remain at least 1,000ft vertically clear of obstacles when flying under IFR, and 500ft clear when flying under VFR. Assuming a maximum WTG tip height of 350m (1,149ft) amsl, this equates to helicopter minimum IFR altitudes of 2,200ft and VFR altitudes of 1,700ft. HMRIs are typically flown at altitudes between 1,500ft and FL85 (approximately 8,500ft amsl). However, helicopters may occasionally be required to operate below 1,500ft to avoid icing conditions. Under these conditions, helicopters with limited anti-icing capability could be unable to overfly the OAA, restricting the available HMRIs and requiring them to fly an extended route to their destination. Most helicopters used in the Northern North Sea that are equipped with an icing clearance however, and as such can transit at higher altitudes.

31.9.2.8 CAP 764 (CAA, 2016) states that for the purposes of transiting wind farm developments under VFR, corridors may be established that are no less then 1nm (1,852m) wide. Discussion with NATS and helicopter operators is required to determine whether such mitigation is necessary or appropriate.

31.9.2.9 Helicopters landing on offshore platforms under IFR must fly an Airborne Radar Approach that requires an approach arc clear of obstacles out to a range of up to 9nm (16.7km). The Golden Eagle PUQ platform helideck is 5.0nm (9.2km) south-west of the OAA, therefore

offshore infrastructure could potentially restrict helicopter access to the platform under certain wind conditions. However, approaches up to 30 degrees out of wind can be made providing the resulting drift angle is no more than 10 degrees, thereby significantly reducing the likelihood of access being restricted due to wind conditions. Any reduction in CAT helicopter access to the platform would be considered a minor logistical impact.

31.9.2.10 Full SAR emergency helicopter access to the Golden Eagle PUQ platform would not be impacted as SAR helicopters are not constrained by CAT meteorological limits.

31.9.2.11 The impact on receptors is predicted to be of local spatial extent, short to medium-term duration, intermittent and low reversibility. The magnitude of the impact is therefore considered to be **low**.

Significance of residual effect

31.9.2.12 Embedded environmental measures detailed in **Table 31.7** with respect to notification, charting, marking and lighting of obstacles would make pilots aware of the addition of infrastructure to the OAA, and it is assumed that pilots would comply with all relevant CAA and MOD aviation regulatory requirements. The ultimate responsibility for seeing and avoiding obstacles rests with captains of civilian and military aircraft. Overall, it is predicted that the sensitivity of the receptors is **medium**, and the magnitude is **low**. The effect is of **Minor Adverse** (**Not Significant**) in EIA terms.

31.9.3 Impact C2: impacts of onshore infrastructure on civil and military aviation

Overview

31.9.3.1 The maximum assessment scenario relating to impacts of onshore infrastructure on civil and military aviation are presented in **Table 31.6**. Where predicted effects are identified, an assessment of the magnitude of change for each effect has been completed based on the methodology provided in **Section 31.8.2**. The magnitude of change, and hence the significance of potential effects has been assessed on the assumption that the embedded environmental measures from **Table 31.7** have been implemented as part of the Project.

31.9.3.2 Longside Airfield is an unlicensed aerodrome 3km west of Peterhead in Aberdeenshire and is the home of Buchan Aero Club. The Onshore Red Line Boundary crosses the airfield extended runway centreline approximately 200m east of the runway 28 threshold.

31.9.3.3 Plant equipment and construction activities associated with the excavation of trenches for the onshore export cables could potentially impede flying activities at Longside Airfield. Digging and exposure of topsoil could attract birds which are a hazard to aircraft.

31.9.3.4 The onshore substation site would be approximately 1km south of Longside Airfield. Obstacles at this location would be unlikely to have any impact on operations at Longside Airfield.

Sensitivity or value of receptor

31.9.3.5 Longside Airfield is deemed to be of moderate value, low vulnerability and high recoverability. The overall sensitivity of the receptor is therefore considered to be **medium**.

Magnitude of impact

31.9.3.6 Engagement with the owner of Longside Airfield would be necessary to ensure that the airfield is made aware of construction activities that could potentially affect operations at the airfield. As detailed in **Table 31.7**, an Outline CEMP would be implemented by the contractor (M-063). The Outline CEMP would be used to coordinate construction activities with the airfield and enable the airfield to raise awareness of potential obstacle hazards for visiting pilots. Management of soil to control potential bird hazards would also be facilitated through the Outline CEMP.

31.9.3.7 The impact on Longside Airfield is predicted to be of local spatial extent, short to medium-term duration, intermittent and reversible. The magnitude of the impact is therefore considered to be **low**.

Significance of residual effect

31.9.3.8 Overall, it is predicted that the sensitivity of Longside Airfield is **medium**, and the magnitude is **low**. The effect is of **Minor Adverse** (**Not Significant**) in EIA terms.

31.10 Assessment of effects: operation and maintenance stage

31.10.1 Introduction

31.10.1.1 This Section provides an assessment of the effects for civil and military aviation from the O&M of the offshore and onshore elements of the Project.

31.10.1.2 The assessment methodology set out in **Section 31.8** has been applied to assess effects to civil and military aviation from the Project.

31.10.2 Impact O1: impacts on civil and military aviation from the creation of offshore aviation obstacles such as WTGs during operation

Overview

31.10.2.1 The maximum assessment scenario relating to the impacts on civil and military aviation from the creation of offshore aviation obstacles such as WTGs during operation are presented in **Table 31.6**. Where predicted effects are identified, an assessment of the magnitude of change for each effect has been completed based on the methodology provided in **Section 31.8.2**. The magnitude of change, and hence the significance of potential effects has been assessed on the assumption that the embedded environmental measures from **Table 31.7** have been implemented as part of the Project.

31.10.2.2 During the O&M stage, the infrastructure outlined in **Table 31.6** would be present in the OAA. This could pose a physical obstruction to aircraft utilising the airspace in the vicinity, potentially increasing the risk of obstacle collision or requiring aircraft to fly extended routes to avoid obstacles.

31.10.2.3 Specifically, permanent or temporary obstacles could impact the following receptors:

- offshore helicopter operations;
- SAR missions; and
- military low flying training operations.

Sensitivity or value of receptor

31.10.2.4 The receptors are deemed to be of high value, but of low vulnerability and high recoverability. The overall sensitivity of the receptors is therefore considered to be **medium**.

Magnitude of impact

31.10.2.5 As detailed in **Table 31.7**, potential impacts on flying activities in the vicinity of the OAA would be mitigated through the development of an Outline Lighting and Marking Plan in agreement with key aviation stakeholders (M-100) and through the provision of the positions and heights of structures to the CAA, MOD and DGC to enable appropriate marking and updating of aeronautical charts (M-047 and M-116). Temporary obstacles, such as during the towing of floating WTGs between wet storage locations and the OAA, would be notified to enable promulgation to civil and military aviation aircrews (M-101).

31.10.2.6 The lighting of WTGs and the WTG layout would be compatible with the SAR requirements detailed in MGN 654 (MCA, 2021) and a SAR Checklist would be completed (M-045). An OOMP (M-122) would be submitted to MD-LOT that would include emergency access arrangements.

31.10.2.7 CAT helicopters utilising HMRIs that route over the OAA would have to remain at least 1,000ft vertically clear of obstacles when flying under IFR, and 500ft clear when flying under VFR. Assuming a maximum WTG tip height of 350m (1,149ft) amsl, this equates to helicopter minimum IFR altitudes of 2,200ft and VFR altitudes of 1,700ft. HMRIs are typically flown at altitudes between 1,500ft and FL85 (approximately 8,500ft amsl); however, helicopters may occasionally be required to operate below 1,500ft to avoid icing conditions. Under these conditions, helicopters with limited anti-icing capability could be unable to overfly the OAA, restricting the available HMRIs and requiring them to fly an extended route to their destination.

31.10.2.8 CAP 764 (CAA, 2016) states that for the purposes of transiting wind farm developments under VFR, corridors may be established that are no less then 1nm (1,852m) wide. Discussion with NATS and helicopter operators is required to determine whether such mitigation is necessary or appropriate.

31.10.2.9 Helicopters landing on offshore platforms under IFR must fly an Airborne Radar Approach that requires an approach arc clear of obstacles out to a range of up to 9nm (16.7km). The Golden Eagle PUQ platform helideck is 5.0nm (9.2km) south-west of the OAA, therefore offshore infrastructure could potentially restrict helicopter access to the platform under certain wind conditions. However, approaches up to 30 degrees out of wind can be made providing the resulting drift angle is no more than 10 degrees, thereby significantly reducing the likelihood of access being restricted due to wind conditions. Any reduction in CAT helicopter access to the platform would be considered a minor logistical impact.

31.10.2.10 Full SAR emergency helicopter access to the Golden Eagle PUQ platform would not be impacted as SAR helicopters are not constrained by CAT meteorological limits.

31.10.2.11 The impact on receptors is predicted to be of local spatial extent, short to medium-term duration, intermittent and low reversibility. The magnitude of the impact is therefore considered to be **low**.

Significance of residual effect

31.10.2.12 Embedded environmental measures detailed in **Table 31.7** with respect to notification, charting, marking and lighting of obstacles would make pilots aware of the addition of infrastructure to the OAA, and it is assumed that pilots would comply with all relevant CAA and MOD aviation regulatory requirements. The ultimate responsibility for seeing and

avoiding obstacles rests with captains of civilian and military aircraft. Overall, it is predicted that the sensitivity of the receptors is **medium**, and the magnitude is **low**. The effect is of **Minor Adverse** (**Not Significant**) in EIA terms.

31.10.3 Impact O2: impacts of onshore infrastructure on civil and military aviation

Overview

31.10.3.1 The maximum assessment scenario relating to impacts of onshore infrastructure on civil and military aviation are presented in **Table 31.6**. Where predicted effects are identified, an assessment of the magnitude of change for each effect has been completed based on the methodology provided in **Section 31.8.2**. The magnitude of change, and hence the significance of potential effects has been assessed on the assumption that the embedded environmental measures from **Table 31.7** have been implemented as part of the Project.

31.10.3.2 The onshore substation site infrastructure would include buildings of up to 30m in height and would be approximately 1km south of Longside Airfield. Obstacles at this location would be unlikely to have any impact on operations at Longside Airfield. Other onshore infrastructure such as onshore export cables would be buried below the surface.

31.10.3.3 Infrequently, the onshore export cable could need to be repaired. In such circumstances, Heavy Goods Vehicles and excavation equipment could be utilised. Plant equipment associated with repair activities in the vicinity of the airfield extended runway centreline could potentially impede flying activities at Longside Airfield. Digging and exposure of topsoil could attract birds which are a hazard to aircraft.

Sensitivity or value of receptor

31.10.3.4 Longside Airfield is deemed to be of moderate value, low vulnerability and high recoverability. The overall sensitivity of the receptor is therefore considered to be **medium**.

Magnitude of impact

31.10.3.5 Engagement with the owner of Longside Airfield would be necessary to ensure that the airfield is made aware of repair activities that could potentially affect operations at the airfield.

31.10.3.6 The impact on Longside Airfield is predicted to be of short-term duration, intermittent and reversible. The magnitude of the impact is therefore considered to be **very low**.

Significance of residual effect

31.10.3.7 Overall, it is predicted that the sensitivity of the Longside Airfield is medium, and the magnitude is very low. The effect is of **Minor Adverse** (**Not Significant**) in EIA terms.

31.10.4 Impact O3: impacts from WTGs on civil and military radar

Overview

31.10.4.1 The maximum assessment scenario relating to impacts from WTGs on civil and military radar are presented in **Table 31.6**. Where predicted effects are identified, an assessment of the magnitude of change for each effect has been completed based on the methodology provided in **Section 31.8.2**. The magnitude of change, and hence the significance of

potential effects has been assessed on the assumption that the embedded environmental measures from **Table 31.7** have been implemented as part of the Project.

31.10.4.2 The OAA would be within the operational range of radar systems serving both civil and military agencies. When operational (i.e. WTGs with blades 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 controllers may be unable to distinguish between primary radar returns generated by WTGs and those generated by aircraft. As a general rule, controllers are required to provide 5nm (9.3km) lateral separation between traffic receiving an ATS and 'unknown' primary radar returns in Class G airspace. This may therefore have an adverse effect on the provision of a safe and effective en-route surveillance service by controllers at NATS Prestwick Centre and other ATS providers such as Aberdeen Airport and may compromise the ability of the MOD to undertake its AD role.

31.10.4.3 Specifically, WTGs in the OAA could impact the following PSR receptors:

- NERL Allanshill;
- NERL Perwinnes; and
- RRH Buchan.

Sensitivity or value of receptor

31.10.4.4 PSRs are deemed to be of high value and vulnerable to WTG impacts, with a high level of recoverability. The overall sensitivity of the receptor is therefore considered to be **high**.

Magnitude of impact

31.10.4.5 In its Scoping Opinion response (**Table 31.1**), NATS stated that WTGs within the OAA are likely to cause false primary plots to be generated for both Allanshill and Perwinnes PSRs and reduce the PSRs' probability of detection for real aircraft. NATS further stated that the scale of the area affected by the predicted clutter would lead to an unacceptable impact on the en-route traffic operation at Prestwick Centre.

31.10.4.6 Similarly, the MOD stated that WTGs within the OAA would be detected by the AD radar at RRH Buchan and that the impact would need to be addressed through a suitable technical mitigation solution.

31.10.4.7 RLoS modelling detailed in **Volume 3, Appendix 31.1** shows that all WTGs within the OAA that lie within the Allanshill PSR operational range of 60nm (111km) would be highly likely to be detected by Allanshill PSR. 61.2% of the OAA is within 60nm of Allanshill PSR.

31.10.4.8 RLoS modelling detailed in **Volume 3, Appendix 31.1** that WTGs with a maximum blade tip height of 350m amsl within only 0.5% of the OAA would be highly likely to be detected by Perwinnes PSR.

31.10.4.9 RLoS modelling detailed in **Volume 3, Appendix 31.1** shows that WTGs with a maximum blade tip height of 350m amsl within 98.2% of the OAA would be highly likely to be detected by Buchan AD PSR, and that WTGs with a maximum blade tip height of 274m amsl within 72.3% of the OAA would be highly likely to be detected by Buchan AD PSR.

31.10.4.10 The impact on PSRs is predicted to be of local spatial extent (limited to within the OAA), medium-term duration, medium to continuous frequency of repetition and not reversible. The magnitude of the impact is therefore considered to be **medium**.

Significance of residual effect

31.10.4.11 WTG generated radar clutter could compromise the safe and effective provision of civil and military ATS. Overall, it is predicted that the sensitivity of PSRs is **high**, and the magnitude is **medium**. The effect is of **Major Adverse** (**Significant**) in EIA terms.

31.10.4.12 Additional mitigation in respect of Allanshill PSR could involve:

- Blanking (not displaying) radar data over 61.2% of the OAA (either at the radar head or in the radar display system) so as to remove the PSR data containing the WTG returns from the radar data presented to controllers; or
- In addition to blanking, introducing TMZ airspace over 61.2% of the OAA which would require all aircraft that wish to transit the TMZ airspace to be equipped with SSR transponders to enable controllers to track aircraft through what would otherwise be a 'black hole' in primary surveillance cover. Implementation of a TMZ would require the submission of an airspace change proposal to the CAA. The formal airspace change process that has to be followed is explained in CAP 1616: The Process for Changing the Notified Airspace Design (CAA, 2023). Recent changes made to the process by the CAA have been designed to facilitate airspace changes in a more proportionate and efficient way that better reflects the nature of the required change. CAP 1616h: Guidance on Airspace Change Process for Level 3 and Pre-Scaled Airspace Change Proposals (CAA, 2023) includes specific guidance for the establishment of TMZs for offshore wind farms and is a pre-scaled airspace change process that excludes some of the more onerous requirements for more significant airspace changes.

31.10.4.13 The same mitigation could be applied for Perwinnes PSR; however, a simpler mitigation may be to agree with NATS to avoid siting WTGs within the 0.5% portion of the OAA within RLoS of Perwinnes PSR. In email correspondence with the applicant in September 2025 (as recorded in **Table 31.1**) NATS states that under standard meteorological conditions Perwinnes PSR detection range only extends to the southwestern corner of the OAA, but that ducting or anaprop effects can increase the detection range.

31.10.4.14 Consultation with NATS is ongoing with the aim of delivering a suitable mitigation solution for Allanshill and Perwinnes PSRs prior to the O&M stage of the Project.

31.10.4.15 In respect of the Buchan AD PSR, a technique applied for previous offshore developments has been the application of a Non-Auto Initiation Zone (NAIZ). A NAIZ is a pre-defined geographical area where spurious radar returns from WTGs will not initiate a track that could be interpreted as an aircraft. In 2018, the MOD stated that NAIZ mitigation had not performed to expectations at flight trials. However, the MOD may still consider the use of a NAIZ as an interim solution for the Project pending the outcome of the initiative described below.

31.10.4.16 In August 2019 an Air Defence and Offshore Wind Windfarm Mitigation Task Force was formed as a collaborative initiative between the MOD, the Department for Business, Energy and Industrial Strategy (which is now the Department for Energy Security and Net Zero (DESNZ)), the Offshore Wind Industry Council (OWIC) and The Crown Estate. The Scottish Government and Crown Estate Scotland joined the Task Force in March 2022. 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.

31.10.4.17 Following the appointment of a new UK Government in July 2024, a new policy was released for delivery and funding of AD radar mitigation within the Clean Power 2030 Action Plan in December 2024. An enduring radar mitigation solution will be identified, procured

and implemented by the MOD via Programme Njord (in collaboration with DESNZ, The Crown Estate and OWIC) with government funding, removing the funding requirement for a radar mitigation solution from offshore wind developers.

31.10.4.18 Consultation with the MOD will continue with the aim of delivering a suitable mitigation solution for Buchan AD PSR prior to the O&M stage of the Project.

31.10.4.19 With suitable secondary mitigations in place the impact on PSRs is considered to be **very low**. A high sensitivity combined with a very low magnitude results in an effect of **Minor Adverse** (**Not Significant**) in EIA terms.

31.11 Assessment of effects: decommissioning stage

31.11.1 Introduction

31.11.1.1 This Section provides an assessment of the effects for civil and military aviation from the decommissioning of the offshore and onshore elements of the Project.

31.11.1.2 The assessment methodology set out in **Section 31.8** has been applied to assess effects to civil and military aviation from the Project.

31.11.2 Impact D1: impacts on civil and military aviation from offshore aviation obstacles

Overview

31.11.2.1 The maximum assessment scenario relating to the impacts on civil and military aviation from offshore aviation obstacles is presented in **Table 31.6**. Where predicted effects are identified, an assessment of the magnitude of change for each effect has been completed based on the methodology provided in **Section 31.8.2**. The magnitude of change, and hence the significance of potential effects has been assessed on the assumption that the embedded environmental measures from **Table 31.7** have been implemented as part of the Project.

31.11.2.2 During the decommissioning stage all the infrastructure above sea level detailed in **Table** 31.6 would be gradually removed. This would reduce the physical obstructions to low flying aircraft utilising the airspace in the vicinity of the Project.

31.11.2.3 Specifically, permanent or temporary obstacles could impact the following receptors:

- offshore helicopter operations;
- SAR missions; and
- military low flying training operations.

Sensitivity or value of receptor

31.11.2.4 The receptors are deemed to be of high value, but of low vulnerability and high recoverability. The overall sensitivity of the receptors is therefore considered to be **medium**.

Magnitude of impact

31.11.2.5 Embedded environmental measures in the form of notification (M-101), charting, marking (M-047 and M-116) and lighting (M-100), as detailed in **Table 31.7**, would be retained until

decommissioning was completed. A Decommissioning Programme (M-106) would be developed and adhered to that would ensure that the process of decommissioning the Project would minimise any impacts on civil and military aviation.

31.11.2.6 The impact on receptors is predicted to be of local spatial extent, short to medium-term duration, intermittent and low reversibility. The magnitude of the impact is therefore considered to be **low**.

Significance of residual effect

31.11.2.7 Embedded environmental measures detailed in **Table 31.7** with respect to notification, charting, marking and lighting of obstacles would maintain pilot awareness of the infrastructure in the OAA, and it is assumed that pilots would comply with all relevant CAA and MOD aviation regulatory requirements. The ultimate responsibility for seeing and avoiding obstacles rests with captains of civilian and military aircraft. Overall, it is predicted that the sensitivity of the receptors is **medium**, and the magnitude is **low**. The effect is of **Minor Adverse** (**Not Significant**) in EIA terms.

31.11.3 Impact D2: Impacts of onshore infrastructure on civil and military aviation

Overview

31.11.3.1 The maximum assessment scenario relating to impacts of onshore infrastructure on civil and military aviation are presented in **Table 31.6**. Where predicted effects are identified, an assessment of the magnitude of change for each effect has been completed based on the methodology provided in **Section 31.8.2**. The magnitude of change, and hence the significance of potential effects has been assessed on the assumption that the embedded environmental measures from **Table 31.7** have been implemented as part of the Project.

31.11.3.2 The onshore substation site would be approximately 1km south of Longside Airfield. Decommissioning activities at this location would be unlikely to have any impact on operations at Longside Airfield.

31.11.3.3 It is currently assumed that onshore export cables would be left in-situ to minimise environmental effects associated with their removal. Further detail would be provided in an onshore decommissioning plan, prepared prior to the start of any decommissioning activities.

Sensitivity or value of receptor

31.11.3.4 Longside Airfield is deemed to be of moderate value, low vulnerability and high recoverability. The overall sensitivity of the receptor is therefore considered to be **medium**.

Magnitude of impact

31.11.3.5 Engagement with the owner of Longside Airfield would be necessary to ensure that the airfield is made aware of decommissioning activities that could potentially affect operations at the airfield.

31.11.3.6 The impact on Longside Airfield is predicted to be of short-term duration, frequency of repetition is negligible and any effects are reversible. The magnitude of the impact is therefore considered to be **very low**.

Significance of residual effect

31.11.3.7 Overall, it is predicted that the sensitivity of Longside Airfield is **medium**, and the magnitude is **very low**. The effect is of **Minor Adverse** (**Not Significant**) in EIA terms.

31.12 Summary of effects

31.12.1.1 A summary of effects arising from the construction, O&M and decommissioning stages of the Project in relation to civil and military aviation are summarise in **Table 31.11**.

Table 31.11 Summary of effects during the construction, O&M and decommissioning stage of the Project on civil and military aviation

Receptor	Sensitivity / value	Activity and potential effect	Embedded environmental measures	Magnitude of effect	Significance of effects
Construction					
Offshore helicopter operations SAR missions Military low flying training operations	**Medium**	Impacts on civil and military aviation from the creation of offshore aviation obstacles.	M-045 M-047 M-100 M-101 M-116	**Low**	**Minor Adverse** (**Not Significant**)
Longside Airfield	**Medium**	Impacts of onshore infrastructure on civil and military aviation.	M-063	**Low**	**Minor Adverse** (**Not Significant**)
Operation and maintenance					
Offshore helicopter operations SAR missions Military low flying training operations	**Medium**	Impacts on civil and military aviation from the creation of offshore aviation obstacles such as WTGs during operation.	M-045 M-047 M-100 M-101 M-116	**Low**	**Minor Adverse** (**Not Significant**)
Longside Airfield	**Medium**	Impacts of onshore infrastructure on civil and military aviation.	-	**Very low**	**Minor Adverse** (**Not Significant**)
NERL Allanshill PSR	**High**	Impacts from WTGs on civil and military radar.	-	**Medium**	**Major Adverse** (**Significant**)

Receptor	Sensitivity / value	Activity and potential effect	Embedded environmental measures	Magnitude of effect	Significance of effects
NERL **Perwinnes PSR** **RRH Buchan** **AD PSR**					
Decommissioning					
Offshore helicopter operations **SAR missions** **Military low flying training operations**	**Medium**	Impacts on civil and military aviation from offshore aviation obstacles.	M-047 M-100 M-101 M-106 M-116	**Low**	**Minor Adverse** (**Not Significant**)
Longside Airfield	**Medium**	Impacts of onshore infrastructure on civil and military aviation.	-	**Very low**	**Minor Adverse** (**Not Significant**)

31.13 Transboundary effects

31.13.1.1 Transboundary effects arise when impacts from a development with one European Economic Area (EEA) State affects the environment of another EEA State(s). A screening of transboundary effects have been carried out and is presented in Appendix 4B of the Scoping Report (MarramWind Ltd., 2023).

31.13.1.2 The screening exercise identified that due to the localised nature of potential impacts, significant transboundary effects upon the interests of other EEA States are considered unlikely.

31.13.1.3 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, there are not considered to be any transboundary effects on civil and military aviation receptors from the Project.

31.14 Inter-related effects

31.14.1.1 A description and assessment of the likely inter-related effects arising from the Project on civil and military aviation is provided in **Chapter 32: Inter-Related effects**.

31.15 Assessment of cumulative effects

31.15.1.1 A description and assessment of the cumulative effects arising from the Project on civil and military aviation is provided in **Chapter 33: Cumulative Effects Assessment**.

31.16 Summary of residual likely significant effects

31.16.1.1 **Table 31.12** presents a summary of the residual likely significant effects on civil and military aviation receptors assessed in the EIA Report Chapter.

Table 31.12 Summary of assessment of residual likely significant effects for civil and military aviation

Receptor	Sensitivity or value	Activity and potential effect	Embedded environmental measures	Magnitude of effect	Significance	Additional mitigation measures	Assessment of residual likely significant effects
Operation and maintenance							
NERL Allanshill PSR NERL Perwinnes PSR RRH Buchan AD PSR.	**High**	Impact O3: Impacts from WTGs on civil and military radar.	-	**Medium**	**Major Adverse** (**Significant**).	See **paragraph 31.10.4.12** to **31.10.4.18**.	**Minor Adverse** (**Not Significant**).

31.17 References

Aberdeenshire Council, (2023a). *Aberdeenshire Local development Plan 2023*. [online] Available at: https://online.aberdeenshire.gov.uk/ldpmedia/LDP2021/AberdeenshireLocalDevelopmentPlan2023IntroductionAndPolicies.pdf [Accessed: 25 July 2025].

Aberdeenshire Council, (2023b). Aberdeenshire Council's Scoping Opinion for Offshore Wind Farm Project at MarramWind Offshore Wind Farm. [online] Available at: https://upa.aberdeenshire.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=RPB0TVCA04U00 [Accessed: 23 April 2025].

Civil Aviation Act 1982. (c.16). [online] Available at: https://www.legislation.gov.uk/ukpga/1982/16/contents [Accessed: 25 July 2025].

Civil Aviation Authority (CAA), (2010). *CAP 793: Safe Operating Practices at Unlicensed Aerodromes*. [online] Available at: https://www.caa.co.uk/publication/download/13965 [Accessed: 25 July 2025].

Civil Aviation Authority (CAA), (2016). *CAP 764: Policy and Guidelines on Wind Turbines*. [online] Available at: https://www.caa.co.uk/publication/download/14561 [Accessed: 25 July 2025].

Civil Aviation Authority (CAA), (2019). *CAP 670: Air Traffic Services Safety Requirements*. [online] Available at: https://www.caa.co.uk/publication/download/17362 [Accessed: 25 July 2025].

Civil Aviation Authority (CAA), (2021a). *CAP 393: Regulations made under powers in the Civil Aviation Act 1982 and the Air Navigation Order 2016*. [online] Available at: https://www.caa.co.uk/publication/download/15773 [Accessed: 25 July 2025].

Civil Aviation Authority (CAA), (2021b). *CAP 774: UK Flight Information Services*. [online] Available at: https://www.caa.co.uk/publication/download/19298 [Accessed: 25 July 2025].

Civil Aviation Authority (CAA), (2022). *CAP 168: Licensing of Aerodromes*. [online] Available at: https://www.caa.co.uk/publication/download/14796 [Accessed: 07 August 2025].

Civil Aviation Authority (CAA), (2023a). *CAP 437: Standards for Offshore Helicopter Landing Areas*. [online] Available at: https://www.caa.co.uk/publication/download/12321 [Accessed: 25 July 2025].

Civil Aviation Authority (CAA), (2023b). *CAP 1616h: Guidance on Airspace Change Process for Level 3 and Pre-Scaled Airspace Change Proposals*. [online] Available at: https://www.caa.co.uk/publication/download/20865 [Accessed: 25 July 2025].

Civil Aviation Authority (CAA), (2025). *Civil Aviation Publication (CAP) 032: UK Aeronautical Information Publication*. [online] Available at: https://nats-uk.ead-it.com/cms-nats/opencms/en/Publications/AIP/ [Accessed: 25 July 2025].

Department for Energy Security and Net Zero (DESNZ), (2023). *National Policy Statement for Renewable Energy Infrastructure (EN-3)*. [online] Available at: https://assets.publishing.service.gov.uk/media/65a7889996a5ec000d731aba/nps-renewable-energy-infrastructure-en3.pdf [Accessed: 25 July 2025].

Department for Energy Security and Net Zero (DESNZ), (2023). *Overarching National Policy Statement for Energy (EN-1)*. [online] Available at: https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf [Accessed: 25 July 2025].

Department for Environment, Food and Rural Affairs (DEFRA), (2011). *UK Marine Policy Statement*. [online] Available at: https://assets.publishing.service.gov.uk/media/5a795700ed915d042206795b/pb3654-marine-policy-statement-110316.pdf [Accessed: 25 July 2025].

International Civil Aviation Organisation (ICAO), (2015). *ICAO EUR DOC 015: European Guidance Material on Managing Building Restricted Areas*. [online] Available at: https://www.baf.bund.de/SharedDocs/Downloads/DE/ICAO_Docs/ICAO_EUR_DOC_2015_ThirdEd_Nov2015.pdf?__blob=publicationFile&v=1 [Accessed: 25 July 2025].

International Civil Aviation Organisation (ICAO), (2022). *Annex 14 Aerodromes: Volume 1 Aerodrome Design and Operations*. [online] Available at: https://store.icao.int/en/annex-14-aerodromes. [Accessed: 25 July 2025].

Maritime and Coastguard Agency (MCA), (2021). *Marine Guidance Note (MGN) 654 Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response*. [online] Available at: https://assets.publishing.service.gov.uk/media/64637cd60b72d3000c34454c/MGN_654.pdf [Accessed: 25 July 2025].

Maritime and Coastguard Agency (MCA), (2024). *Offshore Renewable Energy Installations: Requirements, Guidance and Operational Considerations for SAR and Emergency Response (MGN 654 Annex 5)*. [online] Available at: https://assets.publishing.service.gov.uk/media/65a695fc640602000d3cb75d/OREI_SAR_Requirements_v4_.pdf [Accessed: 25 July 2025].

Met Office, (2025). *Maps of Consultation Zones*. [online] Available at: https://www.metoffice.gov.uk/services/business-industry/energy/safeguarding [Accessed: 25 July 2025].

Ministry of Defence (MOD), (2020). *MOD Obstruction Lighting Guidance*. [online] Available at: https://www.contarnex.com/infrared-obstruction-lighting/MOD%20Obstruction%20Lighting%20Guidance%202020.pdf [Accessed: 25 July 2025].

Ministry of Defence (MOD), (2025). *UK Military Aeronautical Information Publication*. [online] Available at: https://www.aidu.mod.uk/aip/ [Accessed: 25 July 2025].

National Air Traffic Services (NATS), (2025). *Self-assessment Maps*. [online] Available at: https://www.nats.aero/services-products/services/wind-farms/n/wind-farms-self-assessment-maps/ [Accessed: 25 July 2025].

North Sea Transition Authority (NSTA), (2025). *NSTA Offshore Infrastructure (ETRS89)*. [online] Available at: https://opendata-nstauthority.hub.arcgis.com/maps/2d8d2522c07f4b5c89ffb3ceec658d30/about [Accessed: 25 July 2025].

Office of Communications (Ofcom), (2024). *Protected Radar List*. [online] Available at: https://www.ofcom.org.uk/siteassets/resources/documents/manage-your-licence/mobile-wireless-and-broadband/cellular/protected-radar-list.pdf?v=374238 [Accessed: 25 July 2025].

Scottish Government, (2015). *Scotland's National Marine Plan*. [online] Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2015/03/scotlands-national-marine-plan/documents/00475466-pdf/00475466-pdf/govscot%3Adocument/00475466.pdf [Accessed: 25 July 2025].

Scottish Government, (2020). *Sectoral Marine Plan for Offshore Wind Energy*. [online] Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2020/10/sectoral-marine-plan-offshore-wind-energy/documents/sectoral-marine-plan-offshore-

wind-energy/sectoral-marine-plan-offshore-wind-energy/govscot%3Adocument/sectoral-marine-plan-offshore-wind-energy.pdf [Accessed: 25 July 2025].

Scottish Government, (2023a). *National Planning Framework 4*. [online] Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/02/national-planning-framework-4/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4.pdf [Accessed: 25 July 2025].

Scottish Government, (2023b). MarramWind Offshore Wind Farm Environmental Impact Assessment – Scoping Opinion. [online] Available at: https://marine.gov.scot/node/23928 [Accessed: 22 June 2023].

Scottish Government, (2025). *Draft Updated Sectoral Marine Plan for Offshore Wind Energy*. [online] Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/consultation-paper/2025/05/draft-updated-sectoral-marine-plan-offshore-wind-energy-2025/documents/draft-updated-sectoral-marine-plan-offshore-wind-energy/draft-updated-sectoral-marine-plan-offshore-wind-energy/govscot%3Adocument/draft-updated-sectoral-marine-plan-offshore-wind-energy.pdf [Accessed: 07 August 2025].

The Air Navigation Order 2016. (No. 765). [online] Available at: https://www.legislation.gov.uk/uksi/2016/765/contents [Accessed: 25 July 2025].

The Rules of the Air Regulations 2015. (No. 840) [online] Available at: https://www.caa.co.uk/media/l1mhzqnm/the-rules-of-the-air-regulations-2015.pdf [Accessed: 25 July 2025].

31.18 Glossary of terms and abbreviations

31.18.1 Abbreviations

Acronym	Definition
AARA	Air to Air Refuelling Area
AD	Air Defence
AIP	Aeronautical Information Publication
AMA	Area Minimum Altitude
amsl	above mean sea level
ATC	Air Traffic Control
ATS	Air Traffic Service
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CAT	Commercial Air Transport
CEMP	Construction Environmental Management Plan
DA	Danger Area
DESNZ	Department for Energy Security and Net Zero
DGC	Defence Geographic Centre
DHFCS	Defence High Frequency Communications Service
EEA State(s)	European Economic Area Member State(s)
EIA	Environmental Impact Assessment
FIR	Flight Information Region
FL	Flight Level
ft	feet
HMRI	Helicopter Main Routing Indicator
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
km	kilometres

Acronym	Definition
LAT	Lowest Astronomical Tide
m	metre
MCA	Maritime and Coastguard Agency
MD-LOT	Marine Directorate – Licensing Operations Team
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MOD	Ministry of Defence
NAIZ	Non-Auto Initiation Zone
NATS	National Air Traffic Services
NERL	NATS (En-Route) plc
nm	nautical mile
NSTA	North Sea Transition Authority
O&M	Operation and Maintenance
OAA	Option Agreement Area
OREI	Offshore Renewable Energy Installation
OSA	Offshore Safety Area
OWIC	Offshore Wind Industry Council
PSR	Primary Surveillance Radar
PUQ	production, utilities and quarters
Radar	Radio Detection and Ranging
RLoS	Radar Line of Sight
RCP	Reactive Compensation Platform
RRH	Remote Radar Head
s.36	Section 36
SAR	Search and Rescue
SSR	Secondary Surveillance Radar
TMZ	Transponder Mandatory Zone

Acronym	Definition
UK	United Kingdom
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
WTG	Wind Turbine Generator

31.18.2 Glossary of terms

Term	Definition
Controlled airspace	Defined airspace within which pilots must follow ATC instructions implicitly. In the UK, Classes A, C, D and E are areas of controlled airspace.
Flight Information Region	Airspace managed by a controlling authority with responsibility for ensuring air traffic services are provided to aircraft flying within it.
Flight Level	An aircraft altitude expressed in hundreds of feet at a standard sea level pressure datum of 1013.25 hectopascals.
Instrument Flight Procedure	A detailed, pre-defined set of instructions that pilots use to navigate an aircraft, primarily relying on instruments rather than visual references, especially in conditions where visibility is limited.
Instrument Flight Rules	IFR are rules which allow properly equipped aircraft to be flown under IMC.
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).
Primary Surveillance Radar	A radar system that measures the bearing and distance of targets using the detected reflections of radio signals.
Radar	Radar is a commonly accepted noun that is in fact an abbreviation of Radio Detection and Ranging. It is a system of radio waves used to detect the presence and movement of aircraft, maritime vessels, and other moving objects and surface features.
Secondary Surveillance Radar	A radar system that transmits interrogation pulses and receives transmitted responses from suitably equipped targets.
Uncontrolled Airspace	Defined airspace in which ATC does not exercise exclusive authority but may provide basic information services to aircraft in radio contact. In the UK, Class G is uncontrolled airspace.
Visual Flight Rules	VFR are the rules that govern the operation of aircraft in Visual Meteorological Conditions (VMC), conditions in which flight solely by visual reference is possible.

Term	Definition
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.

MarramWind