

**Rampion 2 Wind Farm**  
**Category 6:**  
**Environmental Statement**  
**Volume 2, Chapter 14:**  
**Civil and military aviation**  
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# Executive Summary

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This chapter of the Rampion 2 Environmental Statement (ES) examines the likely significant effects that may be experienced as a result of Rampion 2 on civil and military aviation.

The desk-based assessment considers effects with respect to impacts on radar and UK airspace predicted due to the physical presence of the offshore wind farm and associated air traffic during the construction, operation and maintenance, and decommissioning phases. Potential impacts are physical obstruction to aircraft, increased air traffic in the area related to wind farm activities, and interference on radars caused by rotating Wind Turbine Generator (WTG) blades.

Potentially affected aviation receptors include civil aerodromes, civil and military radar facilities, and offshore fixed-wing and helicopter flights such as military low flying and Search and Rescue (SAR) operations.

A range of mitigation measures related to civil and military aviation are embedded as part of the Rampion 2 design to reduce potential impacts for civil and military aviation. These include the development of an Emergency Response and Cooperation Plan to mitigate the impact on SAR operations, notification to aviation stakeholders of the location and height of all structures over 150 feet tall during construction of the wind farm, and an aviation obstacle lighting scheme agreed with the relevant authorities.

Rampion 2 WTGs are likely to cause interference on the Pease Pottage en route radar facility. However, consultation with the radar operator is ongoing to agree a mitigation solution which will make the impact **Not Significant**.

The maximum Rampion 2 WTG blade tip height may infringe the minimum obstacle clearance requirements of Shoreham Airport's published Instrument Flight Procedures. These procedures are used by aircraft to make safe approaches to the Airport. An assessment and revision of the procedures will make the impact **Not Significant**.

No other significant effects on civil and military aviation have been identified.

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# 14. Civil and military aviation

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## 14.1 Introduction

14.1.1 This chapter of the Environmental Statement (ES) presents the results of the assessment of the likely significant effects of Rampion 2 with respect to civil and military aviation, including the aviation interests of the United Kingdom (UK) Civil Aviation Authority (CAA), Ministry of Defence (MoD), regional airports, local aerodromes, National Air Traffic Service (NATS) (that currently comprises NATS (En Route) plc (NERL) and NATS (Services) Limited (NSL)), and other UK aviation stakeholders. It should be read in conjunction with the project description provided in **Chapter 4: The Proposed Development, Volume 2** of the ES (Document Reference: 6.2.4) and the relevant parts of the following chapters:

- **Chapter 7: Other marine users, Volume 2** (Document Reference: 6.2.7) (which considers military activities);
- **Chapter 13: Shipping and navigation, Volume 2** (Document Reference: 6.2.13) (due to marine activities associated with Search and Rescue operations); and
- **Chapter 15: Seascape, landscape and visual, Volume 2** (Document Reference: 6.2.15) (due to the effect of aviation lighting).

14.1.2 This technical chapter describes:

- the legislation, planning policy and other documentation that has informed the assessment (**Section 14.2: Relevant legislation, planning policy, and other documentation**);
- the outcome of consultation and engagement that has been undertaken to date, including how matters relating to civil and military aviation within the Statutory Consultation periods, have been addressed (**Section 14.3: Consultation and engagement**);
- the scope of the assessment for civil and military aviation (**Section 14.4: Scope of the assessment**);
- the methods used for the baseline data gathering (**Section 14.5: Methodology for baseline data gathering**);
- the overall baseline (**Section 14.6: Baseline conditions**);
- embedded environmental measures relevant to civil and military aviation and the relevant maximum design scenario (**Section 14.7: Basis for ES assessment**);
- the assessment methods used for the ES (**Section 14.8: Methodology for ES assessment**);
- the assessment of civil and military aviation effects (**Section 14.9 - 14.11: Assessment of effects** and **Section 14.12: Assessment of cumulative effects**);

- consideration of transboundary effects (**Section 14.13: Transboundary effects**);
- inter-related effects (**Section 14.14: Inter-related effects**);
- a summary of residual effects for civil and military aviation (**Section 14.15: Summary of residual effects**);
- a glossary of terms and abbreviations is provided in **Section 14.16: Glossary of terms and abbreviations**; and
- a references list is provided in **Section 14.17: References**.

- 14.1.3 The chapter includes a description of the potential impacts on aviation activities with respect to impacts on radar and UK airspace predicted due to the physical presence of wind turbine generators (WTGs) during the construction, operation and maintenance, and decommissioning phases of Rampion 2. An assessment of the potential effects arising from these impacts is undertaken and, where applicable, details of any proposed environmental measures are provided.
- 14.1.4 The chapter is supported by a technical appendix (**Appendix 14.1: Airspace analysis and radar modelling, Volume 4** of the ES (Document Reference: 6.4.14.1), which identifies the radar liable to detect the Rampion 2 WTGs and gives details of the Radar Line of Sight (RLoS) analyses, including a technical analysis of the radar subject to assessment and consideration of radar mitigation options. **Appendix 14.1: Airspace analysis and radar modelling, Volume 4** (Document Reference: 6.4.14.1) also sets out a detailed assessment of the airspace occupied by the offshore part of the Rampion 2 proposed DCO Order limits. The chapter then goes on to outline the modus operandi of Air Navigation Service Providers (ANSPs) in the area and summarises the effects that the Proposed Development is likely to have on aviation activities in the vicinity.
- 14.1.5 Guidance on the issues to be assessed for potential effects on aviation interests from offshore renewable energy developments in general has been obtained through reference to the National Policy Statement (NPS): NPS EN-1 and EN-3.

## 14.2 Relevant legislation, planning policy and other documentation

### Introduction

- 14.2.1 This section identifies the legislation, policy and other documentation that has informed the assessment of effects with respect to civil and military aviation. Further information on policies relevant to the EIA and their status is provided in **Chapter 2: Policy and legislative context, Volume 2** of the ES (Document Reference: 6.2.2) of this ES.

### Legislation and national planning policy

- 14.2.2 **Table 14-1** lists the national planning policy relevant to the assessment of the effects on civil and military aviation receptors.



**Table 14-1 National planning policy relevant to civil and military aviation**

Policy description	Relevance to assessment
<b>Overarching National Policy Statement for Energy (EN-1)</b>	
<p>Paragraphs 5.4.10 to 5.4.13: <i>If the proposed development could have an effect on civil and military aviation, then the assessment should:</i></p> <ol style="list-style-type: none"> <li>1) <i>Consult the MoD, CAA, NATS and any aerodrome – licensed or otherwise – likely to be affected by the proposed project in preparing an assessment of the proposal on aviation or other defence interests;</i></li> <li>2) <i>Include potential impacts of the project upon the operation of CNS [Communications, Navigation &amp; Surveillance] infrastructure, flight patterns (both civil and military), other defence assets and aerodrome operational procedures; and</i></li> <li>3) <i>Assess the cumulative effects of the project with other relevant projects in relation to aviation and defence.</i></li> </ol>	<p>Effects on civil and military aviation during the construction, operation and maintenance, and decommissioning phases are assessed and presented in <b>Sections 14.9 to 14.11: Assessment of effects</b>, including cumulative effects with the existing adjacent Rampion 1 offshore wind farm. Other cumulative effects are assessed in <b>Section 14.12: Assessment of cumulative effects</b>.</p> <p>Consultation with NATS is ongoing regarding the effects of the potential impact on Pease Pottage radar. Consultation with Shoreham Airport is ongoing regarding the effects of the potential impact on the Airport's Instrument Flight Procedures.</p> <p>The MoD have confirmed that the Proposed Development will have no impact on military infrastructure. The western boundary has been revised and no longer infringes Danger Area D037.</p>
<p>Paragraph 5.4.15: <i>If there are conflicts between the Government's energy and transport policies and military interests in relation to the application, the decision maker should expect the relevant parties to have made appropriate efforts to work together to identify realistic and pragmatic solutions to the conflicts. In so doing, the parties should seek to protect the aims and interests of the other parties as far as possible.</i></p>	<p>The MoD have confirmed that the Proposed Development will have no impact on military Air Traffic Control or Air Defence radars; however, they note that the western boundary overlaps Danger Area D037. The boundary has since been revised and no longer overlaps Danger Area D037.</p>
<p>Paragraph 5.4.16: <i>There are statutory requirements concerning lighting to tall structures. Where lighting is requested on structures that goes beyond statutory requirements by any of the relevant aviation and defence consultees, the decision maker should satisfy itself of the necessity of such</i></p>	<p>Marking and lighting requirements are discussed in <b>Section 14.7 paragraphs 14.7.9 to 14.7.14</b>.</p>

Policy description	Relevance to assessment
<p><i>lighting taking into account the case put forward by the consultees. The effect of such lighting on the landscape and ecology may be a relevant consideration.</i></p> <p>Paragraph 5.4.17: <i>Where, after reasonable mitigation, operational changes, obligations, and requirements have been proposed, the decision maker considers that:</i></p> <ol style="list-style-type: none"> <li>1) <i>A development would prevent a licensed aerodrome from maintaining its licence;</i></li> <li>2) <i>The benefits of the proposed development are outweighed by the harm to aerodromes serving business, training or emergency service needs, taking into account the relevant importance and need for such aviation infrastructure; or</i></li> <li>3) <i>The development would significantly impede or compromise the safe and effective use of defence assets or significantly limit military training;</i></li> <li>4) <i>The development would have an impact on the safe and efficient provision of en route air traffic control services for civil aviation, in particular through an adverse effect on the infrastructure required to support communications, navigation or surveillance systems;</i></li> </ol> <p><i>consent should not be granted.</i></p>	<p>The Proposed Development has the potential to generate clutter on radar displays and thus have an impact on the safe and efficient provision of en route air traffic control services for civil aviation. However, mitigation options are available, as discussed in <b>Section 14.10: Assessment of effects: Operation and maintenance phase</b> and set out in detail in <b>Appendix 14.1: Airspace analysis and radar modelling, Volume 4</b> of the ES (Document Reference: 6.4.14.1).</p>
<p>National Policy Statement for Renewable Energy Infrastructure (EN-3)</p>	
<p>Paragraph 2.6.183: <i>Where a wind farm potentially affects other infrastructure or activity, a pragmatic approach should be employed by the decision maker. The decision maker should expect the applicant to minimise negative impacts and reduce risks to as low as reasonably practicable (ALARP).</i></p>	<p>Potential effects during the various phases are assessed in <b>Sections 14.9 to 14.12</b>.</p>
<p>Paragraph 2.6.184: <i>The decision maker should be satisfied that the site selection and design of the</i></p>	<p>A number of embedded environmental measures have been adopted to reduce the potential impacts on civil and military</p>

Policy description	Relevance to assessment
<p><i>wind farm has avoided or minimised disruption or economic loss or any adverse effects on safety to other offshore industries. The decision maker should not consent applications which pose unacceptable risks to safety after mitigation measures have been considered.</i></p>	<p>aviation, as detailed in <b>Section 14.7 paragraphs 14.7.3 to 14.7.18.</b></p>
<p>Paragraph 2.6.186: <i>Where schemes have been carefully designed and the necessary consultation has been undertaken at an early stage, mitigation measures may be possible to negate or reduce effects on other offshore infrastructure to a level sufficient to enable the decision maker to grant consent.</i></p>	<p>Adopted embedded environmental measures are detailed in <b>Section 14.7 paragraphs 14.7.3 to 14.7.18</b> and possible environmental measures for radar impacts are outlined in <b>Section 14.10.</b></p>
<p>Paragraphs 2.6.187 to 2.6.188: <i>Detailed discussions between the applicant and the relevant consultees should have progressed as far as reasonably possible prior to the submission of an application. As such, appropriate mitigation should be included in any application and ideally agreed between relevant parties. In some circumstances, the decision maker may wish to consider the potential to use conditions involving arbitration as a means of resolving how adverse impacts on other commercial activities will be addressed.</i></p>	<p>Further engagement with NATS (October 2022) and Shoreham Airport (May 2022) has taken place. NATS confirmed that their Safeguarding Team was exploring issues with ATC and Safeguarding and will be in touch to discuss options and look to progress the matter forward. Shoreham Airport understands the issue and in principle has no objection. A regulatory process will need to be followed to make the necessary changes to the affected procedures' documentation.</p>
<p>Paragraph 2.6.107: <i>Aviation and navigation lighting should be minimised to avoid attracting birds, taking into account impacts on safety.</i></p>	<p>See <b>Section 14.7, paragraphs 14.7.9 to 14.7.14</b> for proposed lighting.</p>

14.2.3 **Table 14-2** lists the emerging national planning policy considerations relevant to the assessment of the effects on civil and military aviation receptors.

**Table 14-2 Emerging national planning policy relevant to civil and military aviation**

Policy description	Relevance to assessment
Draft Overarching National Policy Statement for Energy (EN-1), March 2023	
<p>Paragraph 5.5.38: <i>Where the proposed development may affect the performance of civil or military aviation CNS [Communications, Navigation and Surveillance], meteorological radars and/or other defence assets an assessment of potential effects should be set out in the ES.</i></p>	<p>Potential effects are set out in <b>Section 14.4 Scope of the assessment</b>. Effects on civil and military aviation during the construction, operation and maintenance, and decommissioning phases are assessed and presented in <b>Sections 14.9 to 14.11: Assessment of effects</b>.</p>
<p>Paragraph 5.5.40: <i>The applicant should consult the MoD, Met Office, Civil Aviation Authority (CAA), NATS and any aerodrome – licensed or otherwise – likely to be affected by the proposed development in preparing an assessment of the proposal on aviation, meteorological or other defence interests.</i></p>	<p>Consultation with NATS is ongoing regarding the effects of the potential impact on Pease Pottage radar. Consultation with Shoreham Airport is ongoing regarding the effects of the potential impact on the Airport's Instrument Flight Procedures. The MoD have confirmed that the Proposed Development will have no impact on military infrastructure. The western boundary has been revised and no longer infringes Danger Area D037.</p>
<p>Paragraph 5.5.41: <i>Any assessment of effects on aviation, meteorological or other defence interests should include potential impacts of the project upon the operation of CNS infrastructure, flight patterns (both civil and military), generation of weather warnings and forecasts, other defence assets (including radar) and aerodrome operational procedures. It should also assess the demonstratable cumulative effects of the project with other relevant projects in relation to aviation, meteorological and defence.</i></p>	<p>Effects on civil and military aviation during the construction, operation and maintenance, and decommissioning phases are assessed and presented in <b>Sections 14.9 to 14.11: Assessment of effects</b>, including cumulative effects with the existing adjacent Rampion 1 offshore wind farm. Other cumulative effects are assessed in <b>Section 14.12: Assessment of cumulative effects</b>.</p>
<p>Paragraph 5.5.54: <i>If there are conflicts between the government's energy and transport policies and military interests in relation to the application, the Secretary of State should expect the relevant parties to have made appropriate efforts to work together to identify realistic and pragmatic solutions to</i></p>	<p>The MoD have confirmed that the Proposed Development will have no impact on military Air Traffic Control or Air Defence radars; however, they note that the western boundary overlaps Danger Area D037. The boundary has since been revised and no longer overlaps Danger Area D037.</p>

Policy description	Relevance to assessment
<p><i>the conflicts. In so doing, the parties should seek to protect the aims and interests of the other parties as far as possible recognising simultaneously the evolving landscape in terms of the UK's energy security and the need to tackle climate change, which necessitates the installation of wind turbines and the need to maintain air safety and national defence and the national weather warning service.</i></p> <p>Paragraphs 5.5.55 and 5.5.56: <i>There are statutory requirements concerning lighting to tall structures. Where lighting is requested on structures that goes beyond statutory requirements by any of the relevant aviation and defence consultees, the Secretary of State should be satisfied of the necessity of such lighting taking into account the case put forward by the consultees. The effect of such lighting on the landscape and ecology may be a relevant consideration. Lighting must also be designed in such a way as to ensure that there is no glare or dazzle to pilots and/or ATC, aerodrome ground lighting is not obscured and that any lighting does not diminish the effectiveness of aeronautical ground lighting and cannot be confused with aeronautical lighting.</i></p>	<p>Marking and lighting requirements are discussed in <b>Section 14.7: Basis for ES assessment paragraphs 14.7.9 to 14.7.14.</b></p> <p>In accordance with ANO Article 223, lighting intensity will be reduced at and below the horizontal and further reduced when visibility in all directions from every WTG is more than 5km.</p>
<p>Paragraph 5.5.60: <i>Where, after reasonable mitigation, operational changes, obligations and requirements have been proposed, the Secretary of State considers that:</i></p> <ol style="list-style-type: none"> <li><i>1) A development would prevent a licensed aerodrome from maintaining its licence and the operational loss of the said aerodrome would have impacts on national security and defence, or result in substantial local/national economic loss, or emergency service needs;</i></li> <li><i>2) It would cause harm to aerodromes' training or emergency service needs;</i></li> </ol>	<p>The Proposed Development has the potential to generate clutter on radar displays and thus have an impact on the safe and efficient provision of en route air traffic control services for civil aviation. However, mitigation options are available, as discussed in <b>Section 14.10: Assessment of effects: Operation and maintenance phase</b> and set out in detail in <b>Appendix 14.1: Airspace analysis and radar modelling, Volume 4</b> of the ES (Document Reference: 6.4.14.1).</p>



Policy description	Relevance to assessment
<p>3) <i>The development would impede or compromise the safe and effective use of defence assets or unacceptably limit military training;</i></p> <p>4) <i>The development would have a negative impact on the safe and efficient provision of en route air traffic control services for civil aviation, in particular through an adverse effect on CNS infrastructure;</i></p> <p>5) <i>The development would compromise the effective provision of weather warnings by the NSWWS [National Severe Weather Warning Service], or flood warnings by the UK’s flood agencies.</i></p> <p><i>Provided that the Secretary of State is satisfied that the impacts present risks to national security and physical safety, such that they outweigh the urgent need for an acceleration in the deployment of offshore wind, or other technology; and provided that the Secretary of State is satisfied that all efforts have been made by the parties to find an acceptable mitigation of the impact, and that such mitigation is not available, consent should not be granted.</i></p>	
<p>Draft National Policy Statement for Renewable Energy Infrastructure (EN-3), March 2023</p>	
<p>Paragraph 3.8.278 to 3.8.279: <i>Detailed discussions between the applicant and the relevant consultees should have progressed as far as reasonably possible prior to the submission of an application. As such, appropriate mitigation should be included in any application, and ideally agreed between relevant parties. In some circumstances, the Secretary of State may wish to consider the potential to use requirements involving arbitration as a means of resolving how adverse impacts on other commercial activities will be addressed.</i></p>	<p>Further engagement with NATS (October 2022) and Shoreham Airport (May 2022) has taken place. NATS confirmed that their Safeguarding Team was exploring issues with ATC and Safeguarding and will be in touch to discuss options and look to progress the matter forward. Shoreham Airport understands the issue and in principle has no objection. A regulatory process will need to be followed to make the necessary changes to the affected procedures’ documentation.</p>
<p>Paragraphs 3.8.360 to 3.8.362:</p>	<p>Potential effects during the various phases are assessed in <b>Sections 14.9 to 14.12.</b></p>

Policy description	Relevance to assessment
<p><i>Where a proposed offshore wind farm potentially affects other offshore infrastructure or activity, a pragmatic approach should be employed by the Secretary of State. Much of this infrastructure is important to other offshore industries as is its contribution to the UK economy. In such circumstances, the Secretary of State should expect the applicant to work with the impacted sector to minimise negative impacts and reduce risks to as low as reasonably practicable (ALARP).</i></p>	
<p>Paragraphs 3.8.363 to 3.8.364:  <i>The Secretary of State should be satisfied that the site selection and design of the wind farm has avoided or minimised disruption or economic loss or any adverse effects on safety to other offshore industries. Applicants will be required to demonstrate that risks to safety will be reduced to ALARP. The Secretary of State should not consent applications which pose intolerable risks to safety after mitigation measures have been considered.</i></p>	<p>A number of embedded environmental measures have been adopted to reduce the potential impacts on civil and military aviation, as detailed in <b>Section 14.7 paragraphs 14.7.3 to 14.7.18.</b></p>
<p>Paragraph 3.8.366:  <i>Where schemes have been carefully designed and the necessary consultation has been undertaken at an early stage, mitigation measures may be possible to negate or reduce effects on other offshore infrastructure to a level sufficient to enable the Secretary of State to grant consent.</i></p>	<p>Adopted embedded environmental measures are detailed in <b>Section 14.7 paragraphs 14.7.3 to 14.7.18</b> and possible mitigation measures for radar impacts are outlined in <b>Section 14.10.</b></p>
<p>Paragraph 3.8.257:  <i>Aviation and navigation lighting should be minimised and/or on demand to avoid attracting birds, taking into account impacts on safety.</i></p>	<p>See <b>Section 14.7 paragraphs 14.7.9 to 14.7.14</b> for proposed lighting. In accordance with ANO Article 223, lighting intensity will be reduced at and below the horizontal and further reduced when visibility in all directions from every WTG is more than 5km.</p>

## Other relevant information and guidance

14.2.4 A summary of other relevant information and guidance relevant to the assessment undertaken for civil and military aviation is provided here:

- CAP 168: Licensing of Aerodromes sets out the standards required at UK licensed aerodromes relating to management systems, operational procedures, physical characteristics, assessment and treatment of obstacles and visual aids. (CAA, 2022);
- Air Navigation Order 2016 (ANO) sets out the Rules of the Air and includes the application of lighting to WTGs in UK territorial waters (Articles 222 and 223). (CAA, 2022);
- CAP 764: Policy and Guidelines on Wind Turbines details the CAA policy and guidelines associated with wind turbine impacts on aviation that aviation stakeholders and wind energy developers need to consider when assessing a development's viability. (CAA, 2016);
- CAP 670: Air Traffic Services Safety Requirements sets out the safety regulatory framework and highlights the requirements to be met by providers of civil air traffic services and other services in the UK in order to ensure that those services are safe for use by aircraft. (CAA, 2019);
- CAP 1616: Airspace Change explains the CAA's regulatory process for changes to airspace. (CAA, 2021);
- CAP 437: Standards for Offshore Helicopter Landing Areas provides the criteria applied by the CAA in assessing offshore helicopter landing areas for worldwide use by helicopters registered in the UK, and includes winching area 'best practice' design criteria for wind turbine platforms. (CAA, 2021);
- CAP 032: UK Aeronautical Information Publication (AIP) is the main resource for information on facilities, services and flight procedures at all licensed UK airports, as well as UK airspace rules, regulations and restrictions, en-route procedures, charts and other air navigation information. (CAA, 2022);
- UK Military AIP is the main resource for information and flight procedures at all military aerodromes. (MoD, 2022);
- Military low flying in the United Kingdom: the essential facts. (MoD, 2017);
- MoD Obstruction Lighting Guidance details MoD requirements for the lighting of offshore developments. (Low Flying Operations Flight, 2020);
- Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 654 Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response highlights issues to consider when assessing navigational safety and emergency response, caused by OREI developments. (MCA, 2021); and
- International Civil Aviation Organisation (ICAO) Annex 14: Aerodrome Design and Operations includes recommendations for marking and lighting of wind turbines. (ICAO, 2022).



## 14.3 Consultation and engagement

### Overview

- 14.3.1 This section describes the stakeholder engagement undertaken for Rampion 2. This consists of the outcome of, and response to, the Scoping Opinion in relation to the civil and military aviation assessment, non-statutory consultation and Rampion 2's statutory consultation. An overview of engagement undertaken for Rampion 2 as a whole can be found in [Chapter 5: Approach to the EIA, Volume 2](#) of the ES (Document Reference: 6.2.5) and the [Consultation Report](#) (Document Reference: 5.1).
- 14.3.2 Given the social distancing restrictions which have been in place due to the COVID-19 pandemic, all technical consultation relating to civil and military aviation has taken place online, primarily in the form of conference calls using Microsoft Teams.

### Scoping Opinion

- 14.3.3 Rampion Extension Development Limited (RED) submitted a Scoping Report (RED, 2020) and request for a Scoping Opinion to the Secretary of State (administered by the Planning Inspectorate (PINS)) on 2 July 2020. A Scoping Opinion was received on 11 August 2020. The Scoping Report sets out the proposed civil and military aviation assessment methodologies, outline of the baseline data collected to date and proposed, and the scope of the assessment. **Table 14-3** sets out the comments received in Section 4 of the PINS Scoping Opinion 'Aspect based scoping tables – Offshore' and how these have been addressed in this ES. A full list of the PINS Scoping Opinion comments and responses is provided in [Appendix 5.2: Responses to the Scoping Opinion, Volume 4](#) of the ES (Application document number 6.4.5.2). Regard has also been given to other stakeholder comments that were received in relation to the Scoping Report.

**Table 14-3 PINS Scoping Opinion responses – civil and military aviation**

PINS ID number	Scoping Opinion comment	How this is addressed in this ES
4.11.1	<i>The Inspectorate agrees that significant aviation effects from construction and operation of the offshore cabling are unlikely and can be scoped out of further assessment.</i>	Aviation effects from construction and operation of the offshore cabling have been scoped out of the assessment (see also <b>Table 14-7</b> ).
4.11.2	<i>On the basis that WTG rotors will be static during construction and would not interfere with radar systems, the Scoping Report suggests that there is no impact pathway during</i>	Acknowledged. Impact of static WTG rotors on radar systems during construction and decommissioning scoped out of the assessment (see also <b>Table 14-7</b> ).

PINS ID number	Scoping Opinion comment	How this is addressed in this ES
4.11.3	<p><i>construction. The Inspectorate agrees that this can be scoped out on this basis and on the basis that the operational assessment effectively encompasses consideration of any significant effects during construction.</i></p> <p><i>On the basis that there are no licensed airfields with a surveillance radar within 30km of any part of the WTG array area, the Applicant seeks to scope this matter out of further assessment. Whilst the Applicant is proposing additional consultation with stakeholders as to the scope of the assessment, the Inspectorate does not consider it appropriate to agree to scoping this matter out on the basis of an arbitrary 30km distance at this stage. The Inspectorate does not consider that sufficient justification has been provided to exclude effects beyond 30km (for example with reference to defined consultation zones). The ES should assess this matter where significant effects are likely to occur.</i></p>	<p>Although CAP 764 recommends a 30km consultation distance for airfields with surveillance radar facilities, Farnborough Airport, Gatwick Airport and Southampton Airport are included in the RLoS modelling assessment detailed in <b>Appendix 14.1: Airspace analysis and radar modelling, Volume 4</b> (Document Reference: 6.4.14.1). The assessment shows that there is no possibility of their radars being affected by Rampion 2 (see also <b>Table 14-7</b>) and therefore no consultation is deemed to be necessary with these airfields.</p>
4.11.4	<p><i>On the basis that there are no no-radar licensed aerodromes within or close to the relevant 12km and 17km consultation distances set out, the Inspectorate agrees that this matter can be scoped out of further assessment.</i></p>	<p>Physical presence and operation of the WTGs leading to impacts on no-radar licensed aerodromes has been scoped out of the assessment (see also <b>Table 14-7</b>).</p>
4.11.5	<p><i>Given the location of the WTGs at least 12km offshore, the Scoping Report identifies that there will be no effects on light aircraft landing strips, gliding sites, microlight sites or parachute sites. The Inspectorate agrees that significant effects during operation are unlikely and can be</i></p>	<p>Physical presence and operation of the WTGs leading to impacts on other civil aviation activities (excluding Search and Rescue (SAR)) has been scoped out of the assessment (see also <b>Table 14-7</b>).</p>

PINS ID number	Scoping Opinion comment	How this is addressed in this ES
	<i>scoped out of further assessment on this basis.</i>	
4.11.6	<p><i>The Scoping Report seeks to rely on an Emergency Response and Cooperation Plan (ERCOP) and appropriate lighting, marking and notification, in line with CAA regulations (to be applied and secured for the Proposed Development) to exclude significant effects. In absence of the detail of an ERCOP and the other measures proposed, the Inspectorate cannot rely on their content as justification for scoping this matter out of the ES. The Inspectorate also notes the potential combined effect on SAR of the construction and operation of the Proposed Development and Rampion 1 and this should be assessed within the ES.</i></p>	<p>Impact on SAR considered as part of the assessment of the various phases of the Proposed Development (see <b>Sections 14.9 to 14.11: Assessment of effects</b>). The combined effect with Rampion 1 is also considered in these sections.</p>
4.11.7	<p><i>Based on the information provided in paragraphs 5.12.31 – 5.12.34, the Scoping Report suggests that it is “evident” that there is sufficient distance from the Proposed Development to rule out significant effects on MoD facilities. Paragraph 5.12.55 also states that there are no air defence radars within a “relevant distance of Rampion 2” although such a distance is not defined. The Inspectorate does not consider sufficient technical and evidence based information has been provided to agree that effects on MoD facilities entirely, not least because the Applicant refers to further consultation with the MoD as part of the scoping process (and potentially beyond). The ES should assess these matters where significant effects are likely to occur.</i></p>	<p>The nearest air defence radars are at Trimmingham, 267km to the north-east, and at Portreath, 329km to the west. Neither of these radars will have RLoS of Rampion 2 turbines. In its Scoping response, the MoD stated that the Proposed Development will have no impact on military Air Traffic Control or Air Defence Radars.</p>

PINS ID number	Scoping Opinion comment	How this is addressed in this ES
4.11.8	<p><i>On the basis that the nearest Met Office radar systems are located at c. 85km from the Proposed Development (in excess of the 20km safeguarded zone around each), the Inspectorate agrees that significant effects are not likely to occur and that this matter can be scoped out of the ES.</i></p>	<p>Effects on Met Office radar systems have been scoped out of the assessment (see also <b>Table 14-7</b>).</p>
4.11.9	<p><i>The Scoping Report relies on the requirement for aviation lighting (with differentiation between aviation and maritime lighting) to be put in place and secured as part of the design of the Proposed Development to justify scoping out this matter. In absence of the detail of these measures (and the need for further consultation in this regard), the Inspectorate cannot rely on their content as justification for scoping this matter out of the ES at this stage. The Inspectorate also notes the potential combined effect of the construction and operation of the Proposed Development and Rampion 1 and this should be assessed as part of the ES.</i></p>	<p>Noting the comment, construction, operation and decommissioning effects on civil and military flight operations have all been scoped into the assessment; see <b>Sections 14.9 to 14.11</b>.</p> <p>The adjacent Rampion 1 offshore wind farm is an existing operational project and is therefore considered as part of the existing baseline. Possible cumulative effects arising from the presence of Rampion 1 are considered in <b>Section 14.6: Baseline conditions</b> and assessed in <b>Sections 14.9, 14.10 and 14.11</b>.</p>
4.11.10	<p><i>Figure 5.12.1 does not actually depict the proposed Study Area, and does not provide a key making it difficult to depict and identify the features set out on the complex basemap (and which are then described listed in the baseline conditions section). The ES should provide a clear definition of the Study Area (including if / how it varies across the various matters considered in the assessment (ie civil and military aviation receptors). Supporting figures should more clearly identify the location(s) of these receptors.</i></p>	<p>The updated Study Area figure (<b>Figure 14.1, Volume 3</b> of the ES (Document Reference 6.3.14) clearly identifies the locations of civil and military aviation receptors as detailed in <b>Section 14.4: Scope of the assessment</b>.</p>

PINS ID number	Scoping Opinion comment	How this is addressed in this ES
4.11.11	<p><i>The Applicant explains that “significance criteria for aviation impacts are typically difficult to establish”, and that further details of the assessment of significance will be provided in the PEIR and ES. The Inspectorate is therefore not able to make any comments on the proposed approach, but expects that the Applicant would define such criteria so that they are compatible with the approach and terminology as set out in section 4 and figure 4.1 of the Scoping Report.</i></p>	<p>The significance criteria used for the assessment are discussed in <b>Section 14.8: Methodology for ES assessment paragraph 14.8.11</b> and defined in <b>Table 14-11</b>.</p>
4.11.12	<p><i>The Inspectorate refers the Applicant to the comments of NATS En Route PLC and the potential effects identified by them on radar infrastructure at Pease Pottage and both the “London Area Control Centre” and “London Terminal Control Centre” Air Traffic Control Centres (ATC). The Inspectorate notes that further consultation will be required in order to enable suitable mitigation (paragraph 5.12.37). The ES should set out how the design and / or other measures secured as part of the Proposed Development propose to mitigate assess these effects.</i></p>	<p>The impact on Pease Pottage has been confirmed by RLoS modelling and mitigation options have been explored in <b>Appendix 14.1: Airspace analysis and radar modelling, Volume 4</b> of the ES (Document Reference: 6.4.14.1). Consultation with NATS is ongoing to determine the most appropriate mitigation solution for the effects on radar infrastructure and ATC.</p>



**Table 14-4 Stakeholder scoping responses – civil and military aviation**

<b>Stakeholder</b>	<b>Date</b>	<b>Comment</b>	<b>Response</b>
<b>MoD</b>	4 August 2020	<i>We have reviewed the development against current operational assets and requirements and this proposed development will have no impact on military Air Traffic Control or Air Defence Radars.</i>	Noted.
<b>MoD</b>	4 August 2020	<i>At 5.12.21 (Aviation baseline) the proposed wind farm is described as being just to the east of D037 however, the MOD assesses that the development would overlap the Danger Area boundary for D037 and therefore could impact on Military training. The MOD would have concerns with any turbines or structures being erected in Danger Area D037 as they would impact on the Navy's freedom to exercise within the Danger Area and cause physical obstructions.</i>	The westernmost extent of the Offshore Array Area has been revised to ensure that there will be no overlap with Danger Area D037.
<b>MoD</b>	4 August 2020	<i>In the interests of air safety, the MOD would request that the development be fitted with MOD accredited aviation safety lighting in accordance with the Civil Aviation Authority, Air Navigation Order 2016.</i>	Appropriate lighting will be fitted in line with CAA ANO 2016, as detailed in <b>Section 14.7: Basis for ES assessment, paragraph 14.7.14.</b>
<b>MoD</b>	4 August 2020	<i>In relation to the onshore element of the proposed development, the extent of the corridor which will contain the onshore cable route is included in the Scoping Report (Figure 1.1 Scoping Boundary). The corridor proposed does not occupy any MOD Land Parcels or MOD statutory safeguarding zones. I can confirm that the MOD does not have any concerns, but we would need to be consulted should the applicant decide to route the cable across or go near any MOD land parcel.</i>	Noted. RED will continue to consult as necessary throughout the application and examination process.

Stakeholder	Date	Comment	Response
		<i>MOD Safeguarding wishes to be consulted and notified about the progression of this proposal and any subsequent application(s) that may be submitted relating to it to verify that it will not adversely affect defence interests.</i>	
<b>NATS</b>	21 July 2020	<i>Predicted Impact on Pease Pottage RADAR: Using the theory as described in Appendix A and development specific propagation profile it has been determined that the terrain screening available will not adequately attenuate the signal, and therefore this development is likely to cause false primary plots to be generated. A reduction in the RADAR's probability of detection, for real aircraft, is also anticipated.</i>	Impact confirmed by modelling and discussed in <b>Section 14.10 : Assessment of effects: Operation and maintenance phase, paragraphs 14.10.18 to 14.10.26.</b>
<b>NATS</b>	21 July 2020	<i>No impact is anticipated on NATS' navigation aids. No impact is anticipated on NATS' radio communications infrastructure.</i>	Noted.

## Non-statutory consultation

### Overview

- 14.3.4 Non-statutory consultation captures all consultation and engagement outside of statutory consultation and has been ongoing with a number of consultation bodies and local authorities in relation to civil and military aviation. A summary of the non-statutory consultation undertaken since completion of the Scoping Report is outlined in this section.

### NATS

- 14.3.5 Non-statutory consultation with NATS has been ongoing since August 2021 in the form of email correspondence.
- 14.3.6 On 7 September 2021 NATS confirmed that their technical assessment concurred with modelling undertaken of potential impacts on the Pease Pottage radar and that their controllers had expressed concern about the levels of predicted clutter. NATS stated that mitigation was likely to be possible, but that they were unsure as to its scope.

- 14.3.7 On 16 February 2022 NATS confirmed that their Safeguarding Team was exploring issues with ATC and Safeguarding and will be in touch to discuss options and look to progress the matter forward.
- 14.3.8 On 11 October 2022 NATS re-confirmed their objection and stated that further effort is still required on their part to look into the most suitable mitigation options.

### Shoreham Airport

- 14.3.9 Non-statutory consultation with Shoreham Airport took place on 11 May 2022 in the form of a Teams meeting.
- 14.3.10 The meeting was held to discuss the potential impact of the Rampion 2 WTGs on the Airport's Instrument Flight Procedures. The Airport understood the issue and in principle had no objection to Rampion 2. It was also understood that a regulatory process will need to be followed to make the necessary changes to the affected procedures' documentation.

### Statutory consultation

- 14.3.11 Rampion 2's first statutory consultation exercise ran from 14 July to 16 September 2021, a period of nine weeks. The PEIR (RED, 2021) was published as part of Rampion 2's first statutory consultation exercise which provided preliminary information on shipping and navigation within Chapter 15: Civil and military aviation (RED, 2021).
- 14.3.12 Following feedback to the Statutory Consultation exercise in 2021 it was identified that some coastal residents did not receive consultation leaflets as intended. Therefore, the first Statutory Consultation exercise was reopened between 7 February 2022 to 11 April 2022 for a further nine weeks. The original PEIR published as part of the first Statutory Consultation exercise in 2021 was unchanged and re-provided alongside the reopened Statutory Consultation exercise in early 2022.
- 14.3.13 The following statutory consultation exercises focussed on changes made to the onshore cable route, onshore substation, and National Grid interface point and did not consider offshore aspects of the Proposed Development.
- 14.3.14 The second Statutory Consultation exercise was undertaken from 18 October 2022 to 29 November 2022. This was a targeted consultation which focused on updates to the onshore cable route proposals which were being considered following feedback from consultation and further engineering and environmental works. As part of this second Statutory Consultation exercise, RED sought feedback on the potential changes to the onshore cable route proposals to inform the onshore design taken forward to DCO application.
- 14.3.15 The third Statutory Consultation exercise was undertaken from 24 February 2023 to 27 March 2023. This was a targeted consultation which focused on a further single onshore cable route alternative being considered following feedback from consultation and further engineering and environmental works. As part of this third Statutory Consultation exercise, RED sought feedback on the potential changes to the onshore cable route proposals to inform the onshore design taken forward to DCO Application.



- 14.3.16 The fourth Statutory Consultation exercise was undertaken from 28 April 2023 to 30 May 2023. This was a targeted consultation which focused on the proposed extension works to the existing National Grid Bolney substation to facilitate the connection of the Rampion 2 onshore cable route into the national grid electricity infrastructure. As part of this fourth Statutory Consultation exercise, RED sought feedback on the proposed substation extension works to inform the onshore design taken forward to the DCO Application.
- 14.3.17 The PEIR assessment boundary has changed substantially taking into consideration S42 comments received in order to address concerns, to arrive at the final proposed DCO Order Limits. Further information on the design refinement process can be found in [Chapter 4: Project Description, Volume 2](#) of the ES (Document Reference: 6.2.4) and [Chapter 3: Alternatives, Volume 2](#) of the ES (Document Reference: 6.2.3).

## 14.4 Scope of the assessment

### Overview

- 14.4.1 This section sets out the scope of the ES assessment for civil and military aviation. This scope has been developed as Rampion 2 design has evolved and responds to feedback received to-date as set out in [Section 14.3: Consultation and engagement](#).
- 14.4.2 The assessment is based on a desktop study of the available information and the potential impact arising from Rampion 2 on international and national Standards and Recommended Practices (SARPs) followed by subsequent consultation with the relevant statutory bodies and interested organisations. A logical and proven methodology, detailed in [Appendix 14.1: Airspace analysis and radar modelling, Volume 4](#) of the ES (Document Reference: 6.4.14.1) and based on the requirements of CAP 764, was used to assess the potential effects of the establishment of the Proposed Development on radars. The outputs of that assessment have then been used in this chapter to consider the consequences of any potential radar impacts on the airspace in the vicinity of Rampion 2.

### Spatial scope and Study Area

#### Overview

- 14.4.3 The spatial scope of the civil and military aviation assessment is defined as the wind farm array area of the proposed DCO Order Limits, an area of 315km<sup>2</sup> to the south-east and west of the existing Rampion 1 project between 13km and 25km from the coastline together with the Zones of Influence (ZOIs) that have formed the basis of the Study Area described in this section and [Figure 14.1, Volume 3](#) of the ES (Document Reference 6.3.14).

#### Civil aerodromes

- 14.4.4 CAP 764 states the distances from various types of aerodromes where consultation should take place. These distances include:

- aerodromes with a surveillance radar – 30km;
- non-radar equipped licensed aerodromes with a runway of more than 1.1km to 17km;
- non-radar equipped licensed aerodromes with a runway of less than 1.1km to 5km;
- licensed aerodromes where the WTGs will lie within airspace coincidental with any published Instrument Flight Procedure (IFP);
- unlicensed aerodromes with runways of more than 0.8km to 4km;
- unlicensed aerodromes with runways of less than 0.8km to 3km;
- gliding sites – 10km; and
- other aviation activity such as parachute sites and microlight sites within 3km.

14.4.5 CAP 764 goes on to state that these distances are for guidance purposes only and do not represent ranges beyond which all wind farm developments will be approved or within which they will always be objected to. These ranges are intended to delimit the Study Area and as a prompt for further discussion between RED and aviation stakeholders.

14.4.6 As well as examining the technical impact of WTGs on Air Traffic Control (ATC) facilities, it is also necessary to consider the physical safeguarding of ATC operations using the criteria laid down in CAP 168 to determine whether a proposed development will breach obstacle clearance criteria.

### Ministry of Defence

- 14.4.7 It is necessary to take into account the aviation and air defence activities of the MoD. This includes:
- MoD airfields, both radar and non-radar equipped;
  - MoD Air Defence (AD) radars; and
  - MoD Danger Areas.

### NERL facilities

14.4.8 It is necessary to take into account the possible effects of WTGs upon NERL radar systems – a network of primary and secondary radars and navigation facilities around the country.

### Other aviation activities

- 14.4.9 It is necessary to take into account other aviation activities, including:
- general military low-flying training operations; and
  - military and civilian 'off-route' fixed-wing and helicopter operations, including SAR missions.

## Temporal scope

- 14.4.10 The temporal scope of the assessment of civil and military aviation is the entire lifetime of Rampion 2, which covers the construction, operation and maintenance, and decommissioning phases.

## Potential receptors

- 14.4.11 The spatial and temporal scope of the assessment enables the identification of receptors which may experience a change as a result of the construction of Rampion 2. The receptors identified that may experience likely significant effects for civil and military aviation are outlined in **Table 14-5**.

**Table 14-5 Receptors requiring assessment for civil and military aviation**

Receptor group	Receptors included within group
<b>Civil aerodromes</b>	Farnborough Airport
	Gatwick Airport
	Shoreham Airport
	Southampton Airport
<b>MoD facilities</b>	Portsmouth Danger Areas
	RAF Odiham
	Portreath AD radar
	Trimingham AD radar
<b>NERL facilities</b>	Pease Pottage radar
	Air Traffic Services
<b>Other aviation activities</b>	Offshore fixed-wing and helicopter operations
	SAR operations
	Military low flying

## Potential effects

- 14.4.12 Potential effects on civil and military aviation receptors that have been scoped in for assessment are summarised in **Table 14-6**.

**Table 14-6 Potential effects on civil and military aviation receptors scoped in for further assessment**

Receptor	Activity or impact	Potential effect
<b>Construction</b>		
<b>Offshore fixed-wing and helicopter operations</b> <b>SAR operations</b> <b>Military low flying</b>	Creation of aviation obstacle environment.	Risk of collision.
<b>Offshore fixed-wing and helicopter operations</b> <b>SAR operations</b> <b>Military low flying</b>	Increased air traffic in the area related to wind farm activities.	Mid-air collision.
<b>Operation and maintenance</b>		
<b>Offshore fixed-wing and helicopter operations</b> <b>SAR operations</b> <b>Military low flying</b>	Creation of aviation obstacle environment.	Risk of collision.
<b>Offshore fixed-wing and helicopter operations</b> <b>SAR operations</b> <b>Military low flying</b>	Increased air traffic in the area related to wind farm activities.	Mid-air collision.
<b>Shoreham Airport</b>	Physical presence and operation of the WTGs leading to impacts on licensed aerodromes where WTGs will be within airspace with published IFPs.	Revision of IFP subject to acceptance by Shoreham Airport.
<b>NERL radar at Pease Pottage</b> <b>NERL ATS</b>	Physical presence and operation of the WTGs leading to	WTGs in coverage areas of NERL radar systems could shield the radars from genuine targets of interest in clutter and a degree

Receptor	Activity or impact	Potential effect
	impacts on NERL radars.	of ‘shadowing’ could be created behind detectable WTGs. Any of these potential effects could impact on the NERL provision of an ATS to aircraft. Whilst mitigation solutions may be agreed, impacts on the performance of this system mean that there is potential for a likely significant effect.
<b>Decommissioning</b>		
<b>Offshore fixed-wing and helicopter operations</b>	Creation of aviation obstacle environment.	Risk of collision.
<b>SAR operations</b>		
<b>Military low flying</b>		
<b>Offshore fixed-wing and helicopter operations</b>	Increased air traffic in the area related to wind farm activities.	Mid-air collision.
<b>SAR operations</b>		
<b>Military low flying</b>		

### Activities or impacts scoped out of assessment

14.4.13 A number of potential effects have been scoped out from further assessment, resulting from a conclusion of no likely significant effect. These conclusions have been made based on the knowledge of the baseline environment, the nature of planned works and the wealth of evidence on the potential for impact gleaned from other projects. The conclusions follow (in a site-based context) existing best practice. Each scoped out activity or impact is considered in turn in **Table 14-7**.

**Table 14-7 Activities or impacts scoped out of assessment**

Activity or impact	Rationale for scoping out
<b>Installation of the offshore cables offshore affecting aviation receptors (Construction, Operation and Decommissioning).</b>	As all of the offshore cable corridor infrastructure will be below sea level, there is no potential source / receptor pathway for an impact to arise on aviation interests for any stage of Rampion 2. All offshore cable aspects are therefore scoped out from consideration within the ES.

Activity or impact	Rationale for scoping out
<p><b>Construction and Decommissioning of the WTGs leading to impacts on civil and military radar systems (Construction and Decommissioning).</b></p>	<p>PINS agreed that significant aviation effects are unlikely and can be scoped out of the EIA in the Scoping Opinion (PINS, 2020).</p> <p>During construction (prior to commissioning) and during the decommissioning phases of Rampion 2, there will be no interference of any civil or military ATC or AD radar systems as the WTG rotors will remain static and will not, therefore, create clutter or affect automated tracking systems. On this basis there is no impact pathway identified during construction and decommissioning and hence this impact is scoped out from the EIA.</p> <p>PINS agreed that impacts during construction and decommissioning can be scoped out of the EIA on this basis in the Scoping Opinion (PINS, 2020).</p>
<p><b>Physical presence and operation of the WTGs leading to impacts on Licensed Airfields with surveillance radar (Operation).</b></p>	<p>The closest radar equipped airfields are Gatwick, 49km to the north, Southampton, 61km to the north-west, and Farnborough, 6 km to the north. RLoS modelling detailed in <a href="#">Appendix 14.1: Airspace analysis and radar modelling, Volume 4</a> of the ES (Document Reference: 6.4.14.1) shows that there is no possibility of their radars being affected by Rampion 2 and hence impacts on radar equipped airfields are scoped out from the EIA.</p> <p>PINS did not consider it appropriate to agree to scoping this matter out on the basis of an arbitrary 30km distance and did not consider that sufficient justification had been provided to exclude effects beyond 30km (PINS, 2020). The RLoS modelling assessment demonstrates that there will be no impacts on radar equipped airfields. No further consideration of such impacts is therefore required.</p>
<p><b>Physical presence and operation of the WTGs leading to impacts on non-radar equipped licensed aerodromes (Operation).</b></p>	<p>There are no non-radar equipped licensed aerodromes with a runway of more than 1,100m within or close to the designated 17km consultation distance. On this basis assessment of these facilities will be scoped out of the EIA.</p> <p>Consultation distance for non-radar equipped licensed aerodromes with a runway of less than 1,100m is 5km. As the offshore part of the proposed DCO Order Limits is at least 12km</p>

Activity or impact	Rationale for scoping out
	<p>offshore, there will be no non-radar licensed aerodromes requiring consultation and this issue is therefore scoped out of the EIA.</p> <p>PINS agreed that this matter can be scoped out of the EIA in the Scoping Opinion (PINS, 2020).</p>
<p><b>Physical presence and operation of the WTGs leading to impacts on other civil aviation activities (excluding SAR) (Operation).</b></p>	<p>Given the location of the WTGs is at least 12km offshore, there will be no effects on light aircraft landing strips, gliding sites, microlight sites or parachute sites. Assessment of potential impacts on these facilities is therefore scoped out of the EIA.</p> <p>PINS agreed that significant effects during operation are unlikely and can be scoped out of the EIA in the Scoping Opinion (PINS, 2020).</p>
<p><b>Physical presence and operation of the WTGs leading to impacts on meteorological radar (Operation).</b></p>	<p>The closest Met Office radar systems are located at Thurnham in Kent and Dean Hill in Wiltshire. Both are 84km from Rampion 2 and well in excess of the 20km safeguarded zone around each radar. Met Office radars will therefore be unaffected and are thus scoped out of the EIA.</p> <p>PINS agreed that significant effects are not likely to occur and that this matter can be scoped out of the EIA in the Scoping Opinion (PINS,2020).</p>

## 14.5 Methodology for baseline data gathering

### Overview

- 14.5.1 Baseline data collection has been undertaken to obtain information over the study areas described in **Section 14.4**. The current baseline conditions presented in **Section 14.6** sets out the currently available information from the Study Area.

### Desk study

- 14.5.2 The data sources that have been collected and used to inform this civil and military aviation assessment are summarised in **Table 14-8**.



**Table 14-8 Data sources used to inform the civil and military aviation ES assessment**

Source	Date	Summary	Coverage of Study Area
<b>CAP 032: UK AIP (CAA, 2022)</b>	June 2022	The main resource for information and flight procedures at all licensed UK airports as well as airspace, en route procedures, charts, and other air navigation information.	Full coverage across the Rampion 2 civil and military aviation Study Area.
<b>UK Military AIP (MoD, 2022)</b>	June 2022	The main resource for information and flight procedures at all military aerodromes.	Full coverage across the Rampion 2 civil and military aviation Study Area.
<b>Raytheon equipment brochure</b>	November 2007	Data on the Raytheon ASR-23SS Primary Surveillance Radar.	NERL Pease Pottage radar facility.

## Data limitations

- 14.5.3 There are no data limitations relating to civil and military aviation that affect the robustness of the assessment of this ES.

## 14.6 Baseline conditions

### Current baseline

#### Civil aviation

- 14.6.1 Rampion 2 is within the London Flight Information Region (FIR) for ATC, the airspace regulated by the UK CAA. The Proposed Development lies within uncontrolled Class G airspace with controlled, predominantly Class A, airspace above that. Class A controlled airspace is the most strictly regulated of the classes whereby aircraft are positively controlled by ATC. Compliance with ATC clearances is mandatory and aircraft are flown and navigated solely with reference to aircraft instruments. A minimum level of onboard communication and navigation equipment is also a prerequisite. Flight in Class G airspace is generally visual, meaning that pilots fly and navigate with reference to the natural horizon and terrain features they see outside. Pilots are required to maintain minimum distances from notified obstacles, including WTGs, and may only fly within the minimum weather and visibility criteria.



- 14.6.2 The Class A airspace above Rampion 2 is designated as part of the Worthing Control Area (CTA) and the London Terminal Control Area (LTMA), with minimum base altitudes of between 5,500ft and Flight Level (FL) 85. An FL is an aircraft altitude expressed in hundreds of feet above a standard sea level pressure datum, so FL85 equates to an altitude of approximately 8,500ft.
- 14.6.3 The controlled airspace above the extreme western edge of Rampion 2 is the Portsmouth CTA Class C airspace which extends upwards from a base of FL125 (approximately 12,500ft above mean sea level (amsl)).
- 14.6.4 NERL provides en route civil air traffic services within the London FIR from the London Area Control Centre at Swanwick, near Southampton. NERL's closest radar is based at Pease Pottage, 43km to the north of Rampion 2.
- 14.6.5 The nearest licensed aerodrome with a surveillance radar is Gatwick Airport, over 50km to the north. The next closest radar equipped aerodromes are Southampton Airport, over 61km to the north-west, and Farnborough Airport 68km to the north.
- 14.6.6 Shoreham Airport is a small non-radar equipped licensed aerodrome with a runway of less than 1,100m, located 17km to the north of Rampion 2. The airport has published an IFP for approaches to Runway 02 that commences approximately 2.5km to the north of the northern boundary of the Rampion 2 array area of the proposed DCO Order Limits. At this point aircraft are required to be at a minimum altitude of 2,200ft and commencing a descent towards the runway down to 1,500ft.
- 14.6.7 The baseline civil aviation airspace and receptors within the Study Area are detailed in **Figure 14.1, Volume 3** of the ES (Document Reference 6.3.14).

### Military aviation

- 14.6.8 The closest military airfield equipped with ATC radar facilities is RAF Odiham, over 66km to the north of Rampion 2.
- 14.6.9 The MoD safeguard a network of long range high powered AD radars used to provide the UK with airspace surveillance and security and to fulfil national and international obligations. The closest AD radars to Rampion 2 are located at Trimingham, 267km to the north-east, and at Portreath, 329km to the west.
- 14.6.10 Immediately to the west of Rampion 2 are the Portsmouth Danger Areas, the closest of which, D037, is adjacent to the western boundary of the Proposed Development. These Danger Areas are activated by Notices to Airmen (NOTAMs) and have vertical limits from the sea surface up to a maximum of 55,000ft amsl. These danger areas are mainly utilised for ships operating out of Portsmouth and are used for radar calibration and tracking, helicopter training and gunnery against airborne towed targets.
- 14.6.11 Radar surveillance is either provided by the ship itself, or further to the west by the remote radar head at Portland, with the control facility located in Plymouth.
- 14.6.12 The baseline military aviation airspace and receptors within the Study Area are detailed in **Figure 14.1, Volume 3** of the ES (Document Reference 6.3.14).

## Helicopter Main Routing Indicators

- 14.6.13 Helicopter Main Routing Indicators (HMRI) are routes typically and routinely flown by helicopters operating to and from offshore destinations and are promulgated for the purpose of highlighting concentrations of helicopter traffic to other airspace users. HMRI promulgation does not predicate the flow of helicopter traffic. Whilst HMRI have no airspace status and assume the background airspace classification within which they lie, they are used by the ANSP and helicopter operators for flight planning and management purposes. In summary, HMRI are recognised routes to assist in regularising routings and effectively managing traffic safely and do not comprise controlled airspace.
- 14.6.14 There are no published HMRI in the vicinity of Rampion 2.

## Flight procedures and ATS provided

- 14.6.15 In Class G (uncontrolled) airspace, aircraft are not obliged to be in receipt of an ATS, although it is open to pilots to seek Air Traffic Services outside Controlled Airspace (ATSOCAS) from the designated ATS provider: the extent of the ATSOCAS supplied will depend on the Communication, Navigation and Surveillance (CNS) capability of the ATS provider, its workload and any regulatory provisions relating to the carriage of CNS equipment by aircraft (for example, transponders). All aircraft above FL100 (circa 10,000ft amsl) in the London FIR are required to carry and operate transponders in accordance with national regulations.
- 14.6.16 To gain access to controlled airspace, a pilot must comply with various mandatory requirements. This includes establishing two-way radio communications with the designated ATC authority for the specified airspace and obtaining permission to enter it. The pilot then must comply with instructions received. In this way, the controllers know of all the air traffic in the defined airspace. The controllers can then take appropriate measures to ensure that standard separation minima are maintained between all known aircraft by using various techniques that may or may not include the use of Primary Surveillance Radar (PSR).
- 14.6.17 Flight procedures in the vicinity of Rampion 2 are conducted in accordance with national UK CAA and MoD SARPs as promulgated in the UK AIP.
- 14.6.18 Given that all aircraft operating above FL100 (circa 10,000ft amsl) are required to be equipped with and operate transponders, the significance of primary radar for the provision of an ATS is more acute in the lower airspace outside of controlled airspace and is especially relevant to helicopter operators.

## Other offshore wind farms

- 14.6.19 For the purposes of the cumulative effects assessment, the current baseline includes other offshore wind farms in the English Channel that could have potential effects on civil and military aviation stakeholders. The only existing offshore wind farm is Rampion 1, adjacent to the Proposed Development. There are no other forms of development (for example existing or proposed onshore (landward of MHWS) wind farms) that need to be considered in a cumulative effects assessment.

## Future baseline

- 14.6.20 There is no expected change to airspace or airspace users. There are no schemes proposed that are considered to affect the future baseline.

## 14.7 Basis for ES assessment

### Maximum design scenario

- 14.7.1 Assessing using a parameter-based design envelope approach means that the assessment considers a maximum design scenario whilst allowing the flexibility to make improvements in the future in ways that cannot be predicted at the time of submission of the DCO Application. The assessment of the maximum adverse scenario for each receptor establishes the maximum potential adverse impact and as a result impacts of greater adverse significance will not arise should any other development scenario (as described in **Chapter 4: The Proposed Development, Volume 2** of the ES (Document Reference: 6.2.4)) to that assessed within this Chapter be taken forward in the final scheme design.
- 14.7.2 The maximum parameters and assessment assumptions that have been identified to be relevant to civil and military aviation are outlined in **Table 14-9** and are in line with the Project Design Envelope (**Chapter 4: The Proposed Development, Volume 2** of the ES (Document Reference: 6.2.4)).



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**Table 14-9 Maximum parameters and assessment assumptions for impacts on civil and military aviation**

Project phase and activity/impact	Maximum parameters	Maximum assessment assumptions	Justification
<b>Construction</b>			
<b>Creation of aviation obstacle environment for airborne receptors.</b>	<p>65 WTGs with a maximum blade tip height of 325m above Lowest Astronomical Tide (LAT), or</p> <p>90 WTGs with a maximum blade tip height of 285m above LAT.</p> <p>The final scenario is likely to be between 65 and 90 WTGs with tip heights between 285m and 325m above LAT. The assessment of impacts is robust for any combination of WTG parameters within these ranges.</p> <p>High crane installation vessels.</p>	<p>Maximum of three offshore substations, topside height (including lightning protection and ancillary structures) 115m above LAT.</p>	<p>Maximum number of the tallest WTGs, or</p> <p>Maximum number of WTGs for the Proposed Development.</p> <p>(Either of the above scenarios could be worst case and both have been assessed for all impacts).</p> <p>Maximum physical obstruction to aviation operations due to size and number of above sea level infrastructure within the Rampion 2 array area of the proposed DCO Order Limits.</p> <p>Impact starting from a point of zero infrastructure present to full presence over a 24-month period.</p>

Project phase and activity/impact	Maximum parameters	Maximum assessment assumptions	Justification
<p><b>Increased air traffic in the area related to wind farm activities affecting the available airspace for other users.</b></p>		<p>Maximum number of 500 helicopter return trips during WTG installation.</p> <p>Maximum number of 30 helicopter return trips during substation installation.</p>	<p>Helicopter trips as a result of being engaged in works on Rampion 2 causing increased likelihood of aircraft-to-aircraft collision.</p>
<p><b>Operation and Maintenance</b></p>			
<p><b>Creation of aviation obstacle environment for airborne receptors.</b></p>	<p>65 WTGs with a maximum blade tip height of 325m above LAT, or</p> <p>90 WTGs with a maximum blade tip height of 285m above LAT.</p> <p>The final scenario is likely to be between 65 and 90 WTGs with tip heights between 285m and 325m above LAT. The assessment of impacts is robust for any combination of WTG parameters within these ranges.</p>	<p>Maximum of three offshore substations, topside height (including lightning protection and ancillary structures) 115m above LAT.</p>	<p>Maximum number of the tallest WTGs, or</p> <p>Maximum number of WTGs for the Proposed Development.</p> <p>(Either of the above scenarios could be worst case and both have been assessed for all impacts).</p> <p>Maximum physical obstruction to aviation operations due to size and number of above sea level infrastructure within the Rampion 2 array area of the proposed DCO Order Limits.</p> <p>Impact present for operational lifetime of a minimum of 30 years.</p>



Project phase and activity/impact	Maximum parameters	Maximum assessment assumptions	Justification
<p><b>Increased air traffic in the area related to wind farm activities affecting the available airspace for other users.</b></p>		<p>120 helicopter return trips per year required for offshore operation and maintenance activities.</p>	<p>Helicopter trips as a result of being engaged in works on Rampion 2 causing increased likelihood of aircraft-to-aircraft collision.</p>
<p><b>WTGs causing permanent interference on civil and military radars.</b></p>	<p>65 WTGs with a maximum blade tip height of 325m above LAT, or</p> <p>90 WTGs with a maximum blade tip height of 285m above LAT.</p> <p>The final scenario is likely to be between 65 and 90 WTGs with tip heights between 285m and 325m above LAT. The assessment of impacts is robust for any combination of WTG parameters within these ranges.</p>		<p>Maximum number of the tallest WTGs, or</p> <p>Maximum number of WTGs for the Proposed Development.</p> <p>(Either of the above scenarios could be worst case and both have been assessed for all impacts).</p> <p>ATC may be unable to provide an effective surveillance service due to interference on radar displays.</p> <p>UK AD detection capability and therefore national security could be compromised.</p> <p>Impact present for operational lifetime of a minimum of 30 years.</p>

## Decommissioning

Project phase and activity/impact	Maximum parameters	Maximum assessment assumptions	Justification
<b>Removal of aviation obstacle environment.</b>	<p>65 WTGs with a maximum blade tip height of 325m above LAT, or</p> <p>90 WTGs with a maximum blade tip height of 285m above LAT.</p> <p>The final scenario is likely to be between 65 and 90 WTGs with tip heights between 285m and 325m above LAT. The assessment of impacts is robust for any combination of WTG parameters within these ranges.</p>	<p>Maximum of three offshore substations, topside height (including lightning protection and ancillary structures) 115m above LAT.</p> <p>High crane installation vessels.</p>	<p>Maximum number of the tallest WTGs, or</p> <p>Maximum number of WTGs for the Proposed Development.</p> <p>(Either of the above scenarios could be worst case and both have been assessed for all impacts).</p> <p>Maximum physical obstruction to aviation operations due to size and number of above sea level infrastructure within the Rampion 2 array area of the proposed DCO Order Limits.</p> <p>Impact starting from a point of full presence of infrastructure to zero presence over the decommissioning period.</p>
<b>Increased air traffic in the area related to wind farm activities affecting the available airspace for other users.</b>		<p>Maximum number of 500 helicopter return trips during WTG decommissioning.</p> <p>Maximum number of 30 helicopter return trips during substation decommissioning.</p>	<p>Helicopter trips as a result of being engaged in works on Rampion 2 causing increased likelihood of aircraft-to-aircraft collision.</p>

## Embedded environmental measures

- 14.7.3 As part of the Rampion 2 design process, a number of embedded environmental measures have been adopted to reduce the potential for 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.
- 14.7.4 These measures also include those that have been identified as good or standard practice and include actions that will 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 Rampion 2 and are set out in this ES.

### Information, notifications and charting

- 14.7.5 Rampion 2 will create an obstacle environment which can effectively be mitigated by compliance with appropriate international and national requirements for the publication of the obstacle locations on charts and in aeronautical documentation, together with the permanent marking and lighting of obstacles.
- 14.7.6 Measures will be adopted at the commencement of works on Rampion 2 to ensure that the aviation sector is made aware of the creation of a further aviation obstacle in the English Channel, namely Rampion 2. These measures will include issuing Notices to Airmen (NOTAMs) and Aeronautical Information Circulars (AICs), warning of the establishment of obstacles within the Rampion 2 array area and publicity in such aviation publications as Safety Sense and the General Aviation Safety Council (GASCo) Flight Safety magazine.
- 14.7.7 At various points during the development details of the position, height (amsl) and lighting of each of the completed permanent structures will be forwarded to the CAA Aeronautical Information Service (AIS) for inclusion in the AIP and on relevant aeronautical charts, as notifiable permanent obstructions. This permanent information will replace the short-term NOTAMs that will continue to be issued to cover the Proposed Development until construction has been completed.
- 14.7.8 En route navigation charts will be updated as the site construction proceeds. All obstacles over 300 ft amsl must be notified to the CAA for inclusion in the UK AIP (section ENR5.4) and on aeronautical maps and to Defence Geographic Centre for inclusion in MoD databases.

### Marking and lighting

- 14.7.9 The international marking and lighting requirement, set out in ICAO Annex 14, specifies that:

*“a wind turbine shall be marked and/or lighted if it is determined to be an obstacle.”; and*

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

- 14.7.10 UK regulations adopt ICAO Annex 14's requirements as to lighting of WTGs but do not require that WTGs follow the ICAO recommendation as to paint colour, although CAP 764 does set out the ICAO recommendation by way of guidance. In terms of marking the WTGs, in keeping with recent practice for offshore wind farms, it is anticipated that Trinity House will require all structures to be painted yellow from the level of MHWS to a height directed by Trinity House, and above the yellow section all WTGs will be painted submarine grey (colour code RAL 7035).
- 14.7.11 Rampion 2 will be lit in accordance with the ANO. ANO Article 222 defines an 'en route obstacle' requiring lighting as:
- any building, structure or erection; and
  - the height of which is 150m or more above ground level (agl).
- 14.7.12 Article 223 modifies the Article 222 requirement with respect to offshore WTGs, requiring:
- WTGs to be lit where they exceed 60m above MHWS;
  - with a medium intensity (2000 candela (cd)) steady red light mounted on the top of each nacelle<sup>1</sup>; and
  - with limited downward spillage of light.
- 14.7.13 Article 223 allows for the CAA to permit that not all WTGs are so lit. The CAA will require that all WTGs on the periphery of any wind farm need to be equipped with aviation warning lighting and such lighting, where achievable, shall be spaced at longitudinal intervals not exceeding 900m. There is no current routine requirement for offshore obstacles to be fitted with intermediate vertically spaced aviation lighting.
- 14.7.14 CAA guidance has been subject to coordination with maritime agencies to avoid confusion with maritime lighting. To that end, the CAA has indicated that the use of a flashing red Morse Code letter 'W' is likely to be approved to resolve potential issues for the maritime community.
- 14.7.15 The MCA is seeking that WTG blade tips are marked in red, together with markings down the blade, to provide a SAR helicopter pilot with a hover reference point as set out in the OREI SAR Requirements document. The MCA also seeks a lighting scheme comprising 200cd red/infra-red lights on the nacelles of non-Article 223 WTGs, to be operated on demand during SAR operations and a WTG shutdown protocol to be applied during rescue situations. These measures will be undertaken and an Emergency Response and Cooperation Plan (ERCOP) will be developed and implemented for all phases of the Proposed Development, based upon the MCA's standard template. Appropriate lighting will be utilised to facilitate heli-hoisting if undertaken within the Rampion 2 array area, as outlined in CAP 437.

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<sup>1</sup> As per C-266 During operation, and where visibility conditions permit, the intensity of aviation warning lights will be reduced to no less than 200cd, subject to the availability of a commercial system, in accordance with the Air Navigation Order 2016

- 14.7.16 To satisfy MoD requirements, the WTGs will also be required to be fitted with infra-red lighting in combination with the ANO Article 223 lights. MoD lighting guidance indicates that operational requirements are satisfied provided combination infra-red/2000 cd visible red lights are used to light the WTGs required to be lit under ANO Article 223.

### Regulatory requirements

- 14.7.17 When construction is complete, given that Rampion 2 will occupy uncontrolled (Class G) airspace (below 5,500ft amsl), the responsibility for avoiding other traffic and obstacles rests with captains of civilian and military aircraft. Thus, logically a pilot will avoid the charted areas, and individually lit WTGs and any other obstacles, laterally or vertically, by the legislated standard minimum separation distance of 500ft.
- 14.7.18 Military operations are subject to separate rules sponsored by the MoD. Pilots of military aircraft will be required to ensure that a Minimum Separation Distance of 250ft from any person, vessel, vehicle, or structure exists whilst operating in the vicinity of the Rampion 2 array area. The charting and lighting of Rampion 2 should also be taken into account by MoD low flying units and SAR operators.
- 14.7.19 It is assumed that aviation stakeholders will adhere to all relevant CAA and MoD safety guidance in the conduct of their specific operations to ensure safe operations for all users of the airspace above Rampion 2.
- 14.7.20 **Table 14-10** sets out the relevant embedded environmental measures within the design and how these affect the civil and military aviation assessment.

**Table 14-10 Relevant civil and military aviation embedded environmental measures**

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to civil and military aviation assessment
<b>C-108</b>	An Emergency Response and Cooperation Plan (ERCOP) will be developed.	Scoping – updated at PEIR.	DCO requirements or dML conditions.	Rampion 2 will create an obstacle environment that may impact SAR helicopter flight operations should SAR be required within or close to Rampion 2. The preparation of an ERCOP in cooperation with the MCA will mitigate the impact.
<b>C-109</b>	Aviation stakeholders will be notified of the location and	Scoping – updated at PEIR.	DCO requirements or dML conditions.	Rampion 2 will create an aviation obstacle environment that can be mitigated by warning the

ID	Environmental measure proposed	Project phase measure introduced	How the environmental measures will be secured	Relevance to civil and military aviation assessment
	height of all wind energy development and associated construction activities (all structures over 150ft).			aviation sector through the issue of NOTAMs and AICs. Permanent information on the Proposed Development will be forwarded to the CAA AIS and Defence Geographic Centre so that the obstructions can be included in the civil and military AIPs and on relevant aeronautical charts.
C-110	RED will agree a lighting scheme for the aviation lighting of structures (turbines and offshore support platforms) above 60m in height with the relevant authorities.	Scoping.	DCO requirements or dML conditions.	To mitigate the impact of WTGs as aviation obstacles and make them more visible to pilots, WTGs must be suitably marked and lit. Requirements for the lighting of offshore WTGs are detailed in Article 223 of the ANO and supplemented by additional MoD guidance.

14.7.21 Further detail on the environmental measures in **Table 14-10** is provided in the **Commitments Register** (Document Reference: 7.22) which sets out how and where particular environmental measures will be implemented and secured.

## 14.8 Methodology for ES assessment

### Introduction

- 14.8.1 The project-wide generic approach to assessment is set out in **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5). The assessment methodology for civil and military aviation for the ES is consistent with that provided in the Scoping Report (RED, 2020) and no changes have been made since the scoping phase or PEIR.
- 14.8.2 The assessment of potential impacts on civil and military aviation has been undertaken with specific reference to the relevant NPS guidance and the requirements and recommendations in the documentation listed in **Section 14.2:**



## Relevant legislation, planning policy and other documentation, paragraph 14.2.4.

### Current baseline

- 14.8.3 An initial desktop study was undertaken to determine those aviation stakeholders that were likely to be affected by Rampion 2, including all radar systems within operational range.
- 14.8.4 The main issue identified is associated with potential WTG interference of Primary Surveillance Radars (PSRs). Due to the physical size of the WTGs proposed, there is also potential for the WTGs to become aviation obstacles or obstructions, particularly to helicopters engaged in offshore operations. This is considered within the impact assessment.
- 14.8.5 CAP 764 advises that WTG effects on Secondary Surveillance Radars (SSRs) can be caused due to the physical blanking and diffracting effects of the WTG towers depending on the size of the WTGs and the wind farm. However, CAP 764 goes on to say that these effects are only a consideration when the WTGs are located close to the SSR, i.e. less than 10km. As the closest known SSR is 45km from the Rampion 2 array area, the impact on SSR is not considered further.
- 14.8.6 Similarly, there will be no measurable effects upon other terrestrial based aviation CNS systems as Rampion 2 is considerably outside applicable safeguarding limits pertaining to such CNS infrastructure. CNS safeguarding limits do not extend beyond 10km from the facility site, and the nearest coastline is 13km from the Rampion 2 array area. Therefore, terrestrial CNS infrastructure (other than PSR) is not considered further, as no sites will be affected.

### Radar modelling

- 14.8.7 Computer modelling using a contemporary software modelling tool (HTZ communications) has been undertaken to predict if RLoS exists between PSRs and WTGs within the Rampion 2 array area of the proposed DCO Order Limits, and the likely Probability of Detection (Pd) of the rotating WTG blades. This exercise identifies those PSRs that could detect the WTGs and has been based on WTGs with a maximum tip height of 325m amsl<sup>2</sup>. The data obtained from the modelling has been analysed and provides a key input into establishing the degree to which aviation and operations in the area of Rampion 2 could be affected and what additional mitigation processes could be employed.
- 14.8.8 The only radar potentially in RLoS of Rampion 2 is the NERL facility at Pease Pottage.
- 14.8.9 The RLoS/Pd modelling conducted for the Pease Pottage Raytheon ASR-23SS ATC PSR had to be based on generic data as the specific and detailed characteristics for this PSR are considered commercially sensitive by NERL.

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<sup>2</sup> Radar modelling was based on tip heights amsl as opposed to above LAT. As mean sea level is generally higher than LAT, amsl calculations incorporate an additional precautionary height buffer.

Therefore, contemporary ATC PSR performance characteristics and publicly available ASR-23SS data have been used in lieu. It must be acknowledged that modelling by NERL sources with detailed configuration data may reveal marginally different Pd results for the ASR-23SS PSR. However, confidence is very high that the PSR performance characteristics used have a high level of compatibility with the ATC PSR performance and previous modelling undertaken by Cyrrus has closely matched NERL predicted radar performance.

- 14.8.10 **Appendix 14.1: Airspace analysis and radar modelling, Volume 4** of the ES (Document Reference: 6.4.14.1) details the computer modelling undertaken and uses the outputs of the modelling to determine potential mitigation strategies for inclusion in this document. Where appropriate, final mitigations will be agreed and implemented with aviation and radar stakeholders. Potential mitigation measures include blanking of the radar in the impacted area, blanking combined with infill from an alternative radar feed, or blanking combined with the imposition of a Transponder Mandatory Zone. One or more of these measures will successfully mitigate the impact on Pease Pottage PSR, see **Appendix 14.1: Airspace analysis and radar modelling, Volume 4** of the ES (Document Reference: 6.4.14.1). Ongoing consultation with stakeholders will continue as part of the design process for Rampion 2.

## Impact assessment methodology

- 14.8.11 In assessing the significance of the effects from Rampion 2 it was necessary to identify whether or not there will be an impact on aviation operations. The aviation industry is highly regulated and subject to numerous mandatory standards, checks and safety requirements (for example CAP 670). Many regulations are international in nature and require the issuing of operating licences. In all cases, the sensitivity or magnitude of the impact on operations can only be identified by the appropriate aviation organisation conforming to the Risk Classification Scheme used to quantify and qualify the severity and likelihood of a hazard occurring. The Risk Classification Scheme is a fundamental element of an aviation organisation's Safety Management System (SMS), which must be acceptable to, and approved by, the UK CAA or the Military Aviation Authority (MAA), as appropriate. As such, for the purposes of this assessment, no detailed grading has been made of the magnitude of the impact or sensitivity of the receptor on the basis that any potential reduction in aviation safety cannot be tolerated. Instead, the following definitions of basic significance have been used as defined in **Table 14-11**. This represents a deviation from the standard methodology presented within **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5).

**Table 14-11 Impact significance definitions**

Potential significance	Definition
<b>Major Significant</b>	Receptor unable to continue safe operations or safe provision of air navigation services (radar) or effective air defence surveillance in the presence of the WTGs. Technical or operational mitigation of the impact is required.
<b>Moderate Significant</b>	Receptor able to continue safe operations but with some restrictions or non-standard mitigation measures in place.
<b>Not Significant</b>	The Proposed Development will have little impact on the aviation stakeholder, or the level of impact will be acceptable to the aviation stakeholder.
<b>No Change</b>	The Proposed Development will have no impact on the aviation stakeholder and will be acceptable to the aviation stakeholder.

## 14.9 Assessment of effects: Construction phase

### Creation of an aviation obstacle environment

- 14.9.1 Construction of the wind farm will involve the installation of infrastructure above sea level which could pose a physical obstruction to aircraft utilising the airspace in the vicinity of Rampion 2.
- 14.9.2 From a starting point of no infrastructure within the Rampion 2 array area of the proposed DCO Order Limits, the infrastructure outlined in **Table 14-9** will gradually be installed over a period of 24 months.
- 14.9.3 Specifically, for Rampion 2, permanent or temporary obstacles can potentially increase risk to:
- general military low flying training and operations; and
  - offshore fixed-wing and helicopter operations, including those undertaking SAR missions, over the English Channel.
- 14.9.4 The construction phase will be conducted in compliance with international and national SARPs with respect to notification, marking and lighting, as outlined in **Section 14.7: Basis for ES assessment, paragraphs 14.7.5 to 14.7.16** and embodied in C-108, C-109 and C-110. By making pilots aware of the addition of infrastructure to the site, the impact on the aviation sector during the construction of Rampion 2 will be reduced to an acceptable level. The impact on general military low flying and offshore fixed-wing and helicopter operations has therefore been assessed to be **Not Significant** in EIA terms.
- 14.9.5 There is potential for cumulative effect as a result of the creation of an aviation obstacle environment associated with Rampion 2 and Rampion 1. For the purposes of this ES, this additive impact has been assessed within 50km of

Rampion 2, which is considered to be the maximum range where the creation of an aviation obstacle to aircraft operating offshore may occur. It should be noted that some impacts will be anticipated to remain localised to the Rampion 2 array area of the proposed DCO Order Limits.

- 14.9.6 The potential cumulative effect of maritime and aviation obstacle lighting creating confusing lighting configurations to both sectors has been addressed and CAA guidance has been subject to coordination with maritime agencies. There will be no cumulative effects on the impact of surface obstacles on aviation operations as compliant markings and lighting will be provided.
- 14.9.7 Through the use of embedded environmental measures such as effective lighting, reliance on pilot competence and consideration of charted obstacles, the cumulative effect from the creation of an obstacle environment is considered to be **Not Significant** in EIA terms.

### Increased air traffic in the area related to wind farm activities

- 14.9.8 The use of helicopters to support construction activities within the Rampion 2 array area of the proposed DCO Order Limits can potentially impact on existing traffic in the area. It is possible that helicopters can be used for transferring people and/or equipment to the site on a daily basis for the construction period.
- 14.9.9 The possible increase in air traffic associated with construction support activities brings with it a potential increased risk of aircraft collision in the area of the Proposed Development.
- 14.9.10 The increase in air traffic will be managed by the existing ATS infrastructure, provided in accordance with national procedures, and pilots will be expected to operate in accordance with regulatory requirements.
- 14.9.11 Due to the predicted low number of movements (less than one return trip on average per day) caused by the construction of Rampion 2 and pilots maintaining compliance with regulatory requirements and national procedures, the impact to aircraft operators in the vicinity of the Rampion 2 site is considered to be **Not Significant** in EIA terms.
- 14.9.12 CAP 764 suggests that, for the purpose of transiting WTG developments under Visual Flight Rules and facilitating construction or maintenance flights within the boundaries of the wind farm, 'flight corridors' may be introduced within the design of the site. However, the existing ATS infrastructure and pilot compliance with regulatory requirements are deemed sufficient to reduce the potential impact to **Not Significant**, this additional mitigation is not considered necessary.
- 14.9.13 There is potential for cumulative effect as a result of increased air traffic in the area related to wind farm activities associated with Rampion 2 and Rampion 1. For the purposes of this ES, this additive impact has been assessed within 50km of Rampion 2, which is considered to be the maximum range where a cumulative increase in air traffic may occur. It should be noted that some impacts will be anticipated to remain localised to the Rampion 2 array area of the proposed DCO Order Limits.
- 14.9.14 The predicted number of daily helicopter movements is considered to be low (<1/day), and there are currently no helicopters engaged in activities associated

with Rampion 1; however, the cumulative effect of this activity and any similar activities associated with Rampion 1 will create a greater potential risk of mid-air collision between aircraft engaged in such operations and aircraft in transit across the Study Area.

- 14.9.15 The potential for such risks occurring is reduced through the implementation of the embedded environmental measures outlined in **Section 14.7, paragraphs 14.7.5 to 14.7.16** and the reliance on pilots not engaged in works in direct relation to Rampion 2 to comply with civil aviation regulations. This means that the cumulative impact to aircraft operators in the vicinity of Rampion 2 is considered to be **Not Significant** in EIA terms.

## 14.10 Assessment of effects: Operation and maintenance phase

### Creation of an aviation obstacle environment

- 14.10.1 During the operation of the Proposed Development, the infrastructure outlined in **Table 14-9** will be present within the Rampion 2 array area. This can potentially pose a physical obstruction to aircraft utilising the airspace in the vicinity of Rampion 2.
- 14.10.2 Specifically, for Rampion 2, permanent or temporary obstacles can increase risk to:
- general military low flying training and operations; and
  - offshore fixed-wing and helicopter operations, including those undertaking SAR missions, over the English Channel.
- 14.10.3 The operation and maintenance phase will be conducted in compliance with international and national SARPs with respect to notification, marking and lighting, as outlined in **Section 14.7: Basis for ES assessment, paragraphs 14.7.5 to 14.7.16** and embodied in C-108, C-109 and C-110. The impact on the aviation sector during the operation of Rampion 2 will therefore be reduced to an acceptable level. The impact has been assessed to be **Not Significant** in EIA terms.
- 14.10.4 There is potential for cumulative effect as a result of the creation of an aviation obstacle environment associated with Rampion 2 and Rampion 1. For the purposes of this ES, this additive impact has been assessed within 50km of Rampion 2, which is considered to be the maximum range where the creation of an aviation obstacle to aircraft operating offshore may occur. It should be noted that some impacts will be anticipated to remain localised to the Rampion 2 array area of the proposed DCO Order Limits.
- 14.10.5 The potential cumulative effect of maritime and aviation obstacle lighting creating confusing lighting configurations to both sectors has been addressed and CAA guidance has been subject to coordination with maritime agencies. There will be no cumulative effects on the impact of surface obstacles on aviation operations as compliant markings and lighting will be provided.

- 14.10.6 Through the use of embedded environmental measures such as effective lighting, reliance on pilot competence and consideration of charted obstacles, the cumulative effect from the creation of an obstacle environment is considered to be **Not Significant** in EIA terms.

### Increased air traffic in the area related to wind farm activities

- 14.10.7 The operation and maintenance phase of Rampion 2 will see an increase in helicopter air traffic above the current baseline level. Up to ten helicopter return trips per month will be made for support operations to the site during this period.
- 14.10.8 The possible increase in air traffic associated with support activities brings with it a potential increased risk of aircraft collision in the area of the Proposed Development.
- 14.10.9 The safety of aircraft operating in uncontrolled airspace ultimately resides with the aircrew who will be operating in accordance with regulatory requirements and who may request the provision of an ATS that will be provided in accordance with national procedures.
- 14.10.10 Due to the predicted low number of movements of less than one helicopter return trip per three days during the operational period of Rampion 2 and pilots maintaining compliance with regulatory requirements and national procedures, the impact to aircraft operators in the vicinity of the Rampion 2 site is considered to be **Not Significant** in EIA terms.
- 14.10.11 There is potential for cumulative effect as a result of increased air traffic in the area related to wind farm activities associated with Rampion 2 and Rampion 1. For the purposes of this ES, this additive impact has been assessed within 50km of Rampion 2, which is considered to be the maximum range where a cumulative increase in air traffic may occur. It should be noted that some impacts will be anticipated to remain localised to the Rampion 2 array area of the proposed DCO Order Limits.
- 14.10.12 The predicted number of daily helicopter movements is considered to be low (<1/day), and there are currently no helicopters engaged in activities associated with Rampion 1, however the cumulative effect of this activity and any similar activities associated with Rampion 1 will create a greater potential risk of mid-air collision between aircraft engaged in such operations and aircraft in transit across the Study Area.
- 14.10.13 The potential for such risks occurring is reduced through the implementation of the embedded environmental measures outlined in **Section 14.7: Basis for ES assessment, paragraphs 14.7.5 to 14.7.16** and the reliance on pilots not engaged in works in direct relation to Rampion 2 to comply with civil aviation regulations. This means that the cumulative impact to aircraft operators in the vicinity of Rampion 2 is considered to be **Not Significant** in EIA terms.



## Physical presence of WTGs leading to impacts on published Instrument Flight Procedures

- 14.10.14 The maximum WTG tip height of 325m above LAT will infringe the minimum obstacle clearance for Shoreham Airport's published IFPs for Runway 02 and Runway 20. Extracts from the IFP charts are shown in [Appendix 14.1: Airspace analysis and radar modelling, Volume 4](#) of the ES (Document Reference: 6.4.14.1) together with an explanation of the associated minimum altitude zones.
- 14.10.15 As currently published, aircraft flying the Shoreham IFPs will not have the required minimum obstacle clearance of 1,000ft above the WTGs. Without mitigation, the potential impact on safe operations at Shoreham Airport is considered to be major significant.
- 14.10.16 Before the construction phase commences, an assessment and revision of the IFPs to re-establish the required obstacle clearance will be undertaken and, subject to acceptance by Shoreham Airport, the residual impact will be reduced to **Not Significant** in EIA terms.

## WTGs causing permanent interference on civil and military radars

- 14.10.17 Rampion 2 will be within the operational range of radar systems serving both civil and military agencies; however, modelling shows that WTGs within the Rampion 2 array area will only be in RLoS of the NERL PSR facility at Pease Pottage, as detailed in [Appendix 14.1: Airspace analysis and radar modelling, Volume 4](#) (Document Reference: 6.4.14.1). The number of WTGs within RLoS of Pease Pottage PSR will depend on the maximum tip height of the individual WTGs and the detailed wind farm configuration selected.
- 14.10.18 When operational (in other words, with blades fitted and rotating), WTGs have the potential to generate 'clutter' (or false targets) upon radar displays, as current generation PSRs are unable to differentiate between the moving blades of WTGs and aircraft. As a consequence, radar operators can be unable to distinguish between primary radar returns generated by WTGs or by aircraft. As a general rule, controllers are required to provide five nautical miles lateral separation between traffic receiving an ATS and 'unknown' primary radar returns in Class G airspace. This may therefore produce an adverse impact on the provision of safe and effective ATS by those ANSPs that utilise the Pease Pottage ATC PSR.
- 14.10.19 Mitigation will be required if the wind farm design, based upon parameters outlined in **Table 14-9**, shows a Pd of the WTGs above the system threshold levels that allows the WTG blades to be presented on PSR displays. Mitigation will only be required for so long as PSRs do not have the inherent capability to distinguish WTG returns from aircraft returns: increasingly, "next generation" PSRs are looking to provide this functionality. This interim additional mitigation for Pease Pottage ATC PSR could involve one or more of the following:
- blanking the relevant impacted areas of the Rampion 2 array area (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;
  - in addition to radar blanking, introducing a Transponder Mandatory Zone (TMZ). A TMZ requires all aircraft that wish to transit the TMZ to be equipped

with SSR transponders to enable controllers to track aircraft through what will otherwise be a “black hole” in primary surveillance cover; or

- blanking combined with using alternative PSRs (for example Gatwick Airport and NERL’s Bovingdon facility) to provide coverage for the provision of ATS in the Rampion 2 array area.

- 14.10.20 CAP 764 outlines other mitigation options which can be applied either singly or in combination to optimise the effectiveness of any mutually agreed solution. Due to the promising developments currently being advanced by industry in this area of technology, consultation on technical measures will continue as a development might emerge that proves to be more suitable for adoption and implementation while Rampion 2 advances and matures.
- 14.10.21 **Appendix 14.1: Airspace analysis and radar modelling, Volume 4** of the ES (Document Reference: 6.4.14.1) sets out the radar modelling findings based on a supplied indicative WTG layout and concludes that mitigation measures are likely to be required for both 285m WTGs and 325m WTGs.
- 14.10.22 Potential mitigation measures include blanking of the radar in the impacted area, blanking combined with infill from an alternative radar feed, or blanking combined with the imposition of a TMZ. Engagement with NERL is ongoing to determine and implement the optimal mitigation solution.
- 14.10.23 Without additional mitigation, the impacts on receptors receiving changes to their operational environment have been assessed to be major significant. However, in our judgement the potential risk posed to aviation operations can be wholly and successfully mitigated through various industry-standard technical solutions applied to the current generation Pease Pottage PSR. It is anticipated that during the operational life of Rampion 2 NERL will procure “next generation” PSRs which are not anticipated to require the application of mitigation measures to allow them to provide an appropriate surveillance picture in the presence of WTGs.
- 14.10.24 Following the application of additional mitigation, the residual impact is considered to be **Not Significant** in EIA terms.
- 14.10.25 There is potential for cumulative effect as a result of operational activities associated with Rampion 2 and Rampion 1. For the purposes of this ES, this additive impact has been assessed within 50km of Rampion 2, which is considered to be the maximum range where aviation and radar cumulative effect may occur. It should be noted that some impacts will be anticipated to remain localised to the Rampion 2 array area of the proposed DCO Order Limits.
- 14.10.26 Rampion 1 is adjacent to Rampion 2 and therefore the potential for an adverse cumulative effect accruing between the two projects needs to be considered. The Rampion 1 ES indicates that no part of the existing Rampion 1 project is likely to be detected by any PSRs, and NERL and the MoD did not object to that development. As no radar interference is predicted for Rampion 1, this presents no cumulative effect with the Proposed Development, therefore the impact is considered to be **Not Significant** in EIA terms.

## 14.11 Assessment of effects: Decommissioning phase

- 14.11.1 Offshore decommissioning will most likely involve removal of all of the WTG components, part of the WTG foundations (down to 1m below the seabed), platforms and associated foundations, and sections of inter-array and export cables.
- 14.11.2 For the decommissioning phase, the implementation of standard aviation safety management processes will be applicable, and a risk assessment based on the appropriate aviation requirements pertinent at the time will be required.

### Creation of an aviation obstacle environment

- 14.11.3 During the decommissioning of Rampion 2, the above sea level infrastructure outlined in **Table 14-9** will be removed over a period of 12 months. This will gradually reduce the physical obstruction to aircraft utilising the airspace in the vicinity of Rampion 2.
- 14.11.4 Specifically, for Rampion 2, permanent or temporary obstacles can potentially increase risk to:
- general military low flying training and operations; and
  - offshore fixed-wing and helicopter operations, including those undertaking SAR missions, over the English Channel.
- 14.11.5 The embedded environmental measures in the form of international and national SARPs with respect to notification, marking and lighting, as outlined in **Section 14.7: Basis for ES assessment, paragraphs 14.7.5 to 14.7.16** and embodied in C-108, C-109 and C-110, will be retained until decommissioning has been completed. The impact on the aviation sector during the construction of Rampion 2 will be reduced to pre-development conditions. The impact has been assessed to be **No Change**.

### Increased air traffic in the area related to wind farm activities

- 14.11.6 The use of helicopters during the decommissioning phase of Rampion 2 can potentially impact on existing traffic in the area. It is possible that helicopters can be used for transferring people and/or equipment to the site on a daily basis during the decommissioning of site infrastructure.
- 14.11.7 The possible increase in air traffic associated with decommissioning support activities brings with it a potential increased risk of aircraft collision in the area of the Proposed Development.
- 14.11.8 The safety of aircraft operating in uncontrolled airspace ultimately resides with the aircrew who will be operating in accordance with regulatory requirements and who may request the provision of an ATS that will be provided in accordance with national procedures.
- 14.11.9 Due to the predicted low number of movements (less than one return trip on average per day) during the decommissioning period of Rampion 2 and pilots maintaining compliance with regulatory requirements and national procedures, the

impact to aircraft operators in the vicinity of Rampion 2 is considered to be **Not Significant** in EIA terms.

- 14.11.10 There is potential for cumulative effect as a result of increased air traffic in the area related to wind farm activities associated with Rampion 2 and Rampion 1. For the purposes of this ES, this additive impact has been assessed within 50km of Rampion 2, which is considered to be the maximum range where a cumulative increase in air traffic may occur. It should be noted that some impacts will be anticipated to remain localised to the Rampion 2 array area.
- 14.11.11 The predicted number of daily helicopter movements is considered to be low (<1/day), and there are currently no helicopters engaged in activities associated with Rampion 1, however the cumulative effect of this activity and any similar activities associated with Rampion 1 will create a greater potential risk of mid-air collision between aircraft engaged in such operations and aircraft in transit across the Study Area.
- 14.11.12 The potential for such risks occurring is reduced through the implementation of the embedded environmental measures outlined in **Section 14.7: Basis for ES assessment, paragraphs 14.7.5 to 14.7.16** and the reliance on pilots not engaged in works in direct relation to Rampion 2 to comply with civil aviation regulations. This means that the cumulative impact to aircraft operators in the vicinity of Rampion 2 is considered to be **Not Significant** in EIA terms.

## 14.12 Assessment of cumulative effects

### Approach

- 14.12.1 A cumulative effects assessment (CEA) examines the combined impacts of Rampion 2 in combination with other developments on the same single receptor or resource and the contribution of Rampion 2 to those impacts. The overall method followed in identifying and assessing potential cumulative effects in relation to the offshore environment is set out in **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5).

### Cumulative effects assessment

- 14.12.2 For civil and military aviation, the ZOI described in **Section 14.4** has been applied for the CEA to ensure direct and indirect cumulative effects can be appropriately identified and assessed. The civil and military aviation ZOI is shown in **Figure 14.1, Volume 3** of the ES (Document Reference 6.3.14).
- 14.12.3 A short list of ‘other developments’ that may interact with the Rampion 2 Zols during their construction, operation or decommissioning is presented in **Appendix 5.4: Cumulative effects assessment shortlisted developments, Volume 4** of the ES (Document Reference: 6.4.5.4) and on **Figure 5.4.1, Volume 3** of the ES (Document Reference 6.4.5.4). This list has been generated applying criteria set out in **Chapter 5: Approach to the EIA, Volume 2** of the ES (Document Reference: 6.2.5) and has been collated up to the finalisation of the ES through desk study, consultation and engagement.

- 14.12.4 Only those ‘other developments’ in this instance other offshore wind farms (OWFs), that fall within the civil and military aviation ZOI have the potential to result in cumulative effects with the Proposed Development on civil and military aviation. All ‘other developments’ falling outside the civil and military aviation ZOI are excluded from this assessment. The following types of OWF developments have the potential to result in cumulative effects on civil and military aviation.
- other OWF developments that could cumulatively create an aviation obstacle environment for aircraft operating offshore;
  - other OWF developments that could cumulatively increase air traffic in the area related to wind farm activities; and
  - other OWF developments that could cumulatively cause permanent interference on civil and military radar systems.
- 14.12.5 On the basis of the above, no ‘other developments’ have been scoped into the civil and military aviation CEA. The adjacent Rampion 1 offshore wind farm is an existing operational project and is therefore considered as part of the existing baseline. Possible interrelated effects arising from the presence of Rampion 1 are considered in conjunction with parameters outlined in **Section 14.7** and assessed in **Sections 14.9, 14.10** and **14.11**.

## 14.13 Transboundary effects

- 14.13.1 Transboundary effects arise when impacts from a development within one European Economic Area (EEA) states affects the environment of another EEA state(s). A screening of transboundary effects has been carried out and is presented in Appendix B of the Scoping Report (RED, 2020).
- 14.13.2 No significant transboundary impacts are predicted as any predicted effects upon civil or military aviation receptors are likely to be limited in extent, being related primarily to the Pease Pottage radar. There is therefore no pathway by which direct or indirect effects arising from Rampion 2 could significantly affect the civil or military aviation receptors of another EEA state.
- 14.13.3 The screening exercise has identified that, due to the localised nature of the potential impacts, significant transboundary effects on civil and military aviation are unlikely to occur and for this reason it is not discussed any further.

## 14.14 Inter-related effects

- 14.14.1 The inter-related effects assessment considers likely significant effects from multiple impacts and activities from the construction, operation and maintenance and decommissioning phases of Rampion 2 on the same receptor, or group of receptors.
- 14.14.2 Inter-related effects could potentially arise in one of two ways. The first type of inter-related effect is a Proposed Development lifetime effect, where multiple phases of the Proposed Development interact to create a potentially more significant effect on a receptor than in one phase alone. The phases for Rampion 2 are construction, operation and maintenance, and decommissioning. All Proposed Development lifetime effects are assessed in **Chapter 30: Inter-related**

**effects, Volume 2** of the ES (Document Reference: 6.2.30). There are no anticipated Proposed Development phase inter-related effects in relation to civil and military aviation.

- 14.14.3 The second type of inter-related effect is receptor-led effects. Receptor-led effects are where effects from different environmental aspects combine spatially and temporally on a receptor. These effects may be short-term, temporary, transient, or longer-term.
- 14.14.4 Aviation lighting fitted to offshore WTGs could cause confusion to the maritime community as the specification for the lighting to be displayed below the horizontal plane of the light fitment itself could mean that it is indistinguishable from maritime lighting. As a result, the conflicting warning lighting on the WTGs could potentially cause confusion to maritime surface vessels, which in turn could lead to a potential collision risk. Effects of aviation lighting is considered as an inter-related effect in **Chapter 13: Shipping and navigation, Volume 2** of the ES (Document Reference: 6.2.13) and **Chapter 15: Seascape, landscape and visual impacts, Volume 2** of the ES (Document Reference: 6.2.15).
- 14.14.5 Work has been undertaken to develop an aviation warning lighting standard where, from the nature of the lighting, it will be apparent to mariners that the aviation lighting is clearly distinguishable from maritime lighting. Where it is evident that the default aviation warning lighting standard may generate issues for the maritime community a developer can make a case, that is likely to receive CAA approval, for the use of a flashing red Morse Code Letter 'W' instead (see CAP 764 paragraph 3.16).
- 14.14.6 Full results of the receptor-led effects assessment can be found in **Chapter 30: Inter-related effects, Volume 2** of the ES (Document Reference: 6.2.30).

## 14.15 Summary of residual effects

- 14.15.1 **Table 14-12** presents a summary of the assessment of potential significant impacts and any relevant embedded environmental measures and residual effects on civil and military aviation receptors.



**Table 14-12 Summary of assessment of residual effects**

<b>Activity and impact</b>	<b>Magnitude of impact</b>	<b>Receptor and sensitivity or value</b>	<b>Embedded environmental measures</b>	<b>Assessment of residual effect (significance)</b>
<b>Construction</b>				
<b>Creation of an aviation obstacle environment.</b>	<b>Not Significant</b>	Military low flying Offshore fixed-wing and helicopter operations SAR operations	C-108, C-109, C-110	<b>Not Significant</b>
<b>Increased air traffic in the area related to wind farm activities.</b>	<b>Not Significant</b>	Military low flying Offshore fixed-wing and helicopter operations SAR operations		<b>Not Significant</b>
<b>Operation and maintenance</b>				
<b>Creation of an aviation obstacle environment.</b>	<b>Not Significant</b>	Military low flying Offshore fixed-wing and helicopter operations SAR operations	C-108, C-109, C-110	<b>Not Significant</b>
<b>Increased air traffic in the area related to wind farm activities.</b>	<b>Not Significant</b>	Military low flying Offshore fixed-wing and helicopter operations SAR operations		<b>Not Significant</b>

<b>Activity and impact</b>	<b>Magnitude of impact</b>	<b>Receptor and sensitivity or value</b>	<b>Embedded environmental measures</b>	<b>Assessment of residual effect (significance)</b>
<b>Physical presence of WTGs leading to impacts on published IFPs.</b>	<b>Major Significant</b>	Shoreham Airport	Assessment/revision of IFPs.	<b>Not Significant</b>
<b>WTGs causing permanent interference on civil and military radars.</b>	<b>Major Significant</b>	NERL Pease Pottage ATC PSR	Radar technical solution at source.	<b>Not Significant</b>
<b>Decommissioning</b>				
<b>Creation of an aviation obstacle environment.</b>	<b>No Change</b>	Military low flying Offshore fixed-wing and helicopter operations SAR operations	C-108, C-109, C-110	<b>No Change</b>
<b>Increased air traffic in the area related to wind farm activities.</b>	<b>Not Significant</b>	Military low flying Offshore fixed-wing and helicopter operations SAR operations		<b>Not Significant</b>

## 14.16 Glossary of terms and abbreviations

Table 14-13 Glossary of terms and abbreviations – civil and military aviation

Term (acronym)	Definition
<b>AD</b>	Air Defence
<b>agl</b>	above ground level
<b>AIC</b>	Aeronautical Information Circular
<b>AIP</b>	Aeronautical Information Publication
<b>Air Navigation Service Provider (ANSP)</b>	A public or private entity managing air traffic on behalf of a company, region or country. NATS is the main ANSP in the UK.
<b>AIS</b>	Aeronautical Information Circular
<b>ALARP</b>	As Low As Reasonably Practicable
<b>amsl</b>	above mean sea level
<b>ANO</b>	Air Navigation Order
<b>ATC</b>	Air Traffic Control
<b>ATS</b>	Air Traffic Service
<b>ATSOCAS</b>	Air Traffic Service Outside Controlled Airspace
<b>Baseline</b>	Refers to existing conditions as represented by latest available survey and other data which is used as a benchmark for making comparisons to assess the impact of development.
<b>Baseline conditions</b>	The environment as it appears (or would appear) immediately prior to the implementation of the Proposed Development together with any known or foreseeable future changes that will take place before completion of the Proposed Development.
<b>CAA</b>	Civil Aviation Authority
<b>CAP</b>	Civil Aviation Publication
<b>CNS</b>	Communication, Navigation and Surveillance
<b>Construction effects</b>	Used to describe both temporary effects that arise during the construction phases as well as permanent existence

<b>Term (acronym)</b>	<b>Definition</b>
	effects that arise from the physical existence of development (for example new buildings).
<b>Controlled airspace</b>	Defined airspace within which pilots must follow Air Traffic Control instructions implicitly. In the UK, Classes A, C, D and E are areas of controlled airspace.
<b>CTA</b>	Control Area
<b>Cumulative effects</b>	Additional changes caused by a Proposed Development in conjunction with other similar developments or as a combined effect of a set of developments.
<b>Cumulative Effects Assessment (CEA)</b>	Assessment of impacts as a result of the incremental changes caused by other past, present and reasonably foreseeable human activities and natural processes together with the Proposed Development.
<b>DCO Application</b>	An application for consent under the Planning Act 2008 to undertake a Nationally Significant Infrastructure Project made to the Planning Inspectorate who will consider the application and make a recommendation to the Secretary of State, who will decide on whether development consent should be granted for the Proposed Development.
<b>Decommissioning</b>	The period during which a development and its associated processes are removed from active operation.
<b>Development Consent Order (DCO)</b>	This is the means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects, under the Planning Act 2008.
<b>EEA</b>	European Economic Area
<b>Embedded environmental measures</b>	Equate to 'primary environmental measures' as defined by Institute of Environmental Management and Assessment (2016). They are measures to avoid or reduce environmental effects that are directly incorporated into the preferred masterplan for the Proposed Development.
<b>Environmental Impact Assessment (EIA)</b>	The process of evaluating the likely significant environmental effects of a proposed project or development over and above the existing circumstances (or 'baseline').
<b>Environmental Measures</b>	Measures which are proposed to prevent, reduce and where possible offset any significant adverse effects (or to avoid, reduce and if possible, remedy identified effects).

<b>Term (acronym)</b>	<b>Definition</b>
<b>Environmental Statement (ES)</b>	The written output presenting the full findings of the Environmental Impact Assessment.
<b>ERCOP</b>	Emergency Response and Cooperation Plan
<b>FIR</b>	Flight Information Region
<b>FL</b>	Flight Level
<b>Flight Information Region (FIR)</b>	Airspace managed by a controlling authority with responsibility for ensuring air traffic services are provided to aircraft flying within it.
<b>Flight Level (FL)</b>	An aircraft altitude expressed in hundreds of feet at a standard sea level pressure datum of 1013.25 hectopascals.
<b>Future baseline</b>	Refers to the situation in future years without the Proposed Development.
<b>GASCo</b>	General Aviation Safety Council
<b>HAT</b>	Highest Astronomical Tide
<b>HMR</b>	Helicopter Main Route
<b>HMRI</b>	Helicopter Main Routing Indicator
<b>ICAO</b>	International Civil Aviation Organisation
<b>IFP</b>	Instrument Flight Procedure
<b>Impact</b>	The changes resulting from an action.
<b>Indirect effects</b>	<p>Effects that result indirectly from the Proposed Development as a consequence of the direct effects, often occurring away from the site, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the source of the effects.</p> <p>Often used to describe effects on landscape character that are not directly impacted by the Proposed Development such as effects on perceptual characteristics and qualities of the landscape.</p>
<b>LAT</b>	Lowest Astronomical Tide
<b>Likely Significant Effects</b>	It is a requirement of Environmental Impact Assessment Regulations to determine the likely significant effects of the Proposed Development on the environment which

<b>Term (acronym)</b>	<b>Definition</b>
	should relate to the level of an effect and the type of effect.
<b>LTMA</b>	London Terminal Control Area
<b>MAA</b>	Military Aviation Authority
<b>Magnitude (of change)</b>	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short term or long term in duration'. Also known as the 'degree' or 'nature' of change.
<b>MCA</b>	Maritime and Coastguard Agency
<b>MGN</b>	Marine Guidance Note
<b>MHWS</b>	Mean High Water Spring
<b>MoD</b>	Ministry of Defence
<b>Nationally Significant Infrastructure Project (NSIP)</b>	Nationally Significant Infrastructure Projects are major infrastructure developments in England and Wales which are consented by DCO. These include proposals for renewable energy projects with an installed capacity greater than 100MW.
<b>NATS</b>	National Air Traffic Service
<b>NERL</b>	NATS (En Route) plc
<b>NOTAM</b>	Notice to Airmen
<b>NPS</b>	National Policy Statement
<b>NSL</b>	NATS (Services) Limited
<b>Onshore</b>	Landward of Mean High Water Spring (MHWS)
<b>OREI</b>	Offshore Renewable Energy Installation
<b>OWF</b>	Offshore Wind Farm
<b>Pd</b>	Probability of detection
<b>Planning Inspectorate</b>	The Planning Inspectorate deals with planning appeals, national infrastructure planning applications, examinations of local plans and other planning-related and specialist casework in England and Wales.



Term (acronym)	Definition
<b>Preliminary Environmental Information Report (PEIR)</b>	The written output of the Environmental Impact Assessment undertaken to date for the Proposed Development. It is developed to support statutory consultation and presents the preliminary findings of the assessment to allow an informed view to be developed of the Proposed Development, the assessment approach that has been undertaken, and the preliminary conclusions on the likely significant effects of the Proposed Development and environmental measures proposed.
<b>Primary Surveillance Radar (PSR)</b>	A radar system that measures the bearing and distance of targets using the detected reflections of radio signals.
<b>Proposed Development</b>	The development that is subject to the application for development consent, as described in <a href="#">Chapter 4: The Proposed Development, Volume 2</a> (Document Reference: 6.2.4).
<b>Receptor</b>	These are as defined in Regulation 5(2) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and include population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and landscape that may be at risk from exposure to pollutants which could potentially arise as a result of the Proposed Development.
<b>RLoS</b>	Radar Line of Sight
<b>SAR</b>	Search And Rescue
<b>SARPs</b>	Standards And Recommended Practices
<b>Scoping Opinion</b>	A Scoping Opinion is adopted by the Secretary of State for a Proposed Development.
<b>Scoping Report</b>	A report that presents the findings of an initial stage in the Environmental Impact Assessment process.
<b>Secondary Surveillance Radar (SSR)</b>	A radar system that transmits interrogation pulses and receives transmitted responses from suitably equipped targets.
<b>Secretary of State</b>	The body who makes the decision to grant development consent.
<b>Sensitivity</b>	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the

Term (acronym)	Definition
	specific type of change or development proposed and the value associated to that receptor.
<b>Significance</b>	A measure of the importance of the environmental effect, defined by criteria specific to the environmental aspect.
<b>Significant effects</b>	<p>It is a requirement of the EIA Regulations to determine the likely significant effects of the development on the environment which should relate to the level of an effect and the type of effect. Where possible significant effects should be mitigated.</p> <p>The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and the sensitivity of the receptor) that should be attached to the impact described.</p> <p>Whether or not an effect should be considered significant is not absolute and requires the application of professional judgement. Significant – ‘noteworthy, of considerable amount or effect or importance, not insignificant or negligible’.</p> <p>Those levels and types of landscape and visual effect likely to have a major or important / noteworthy or special effect of which a decision maker should take particular note.</p>
<b>SMS</b>	Safety Management System
<b>Statutory consultation</b>	Statutory consultation refers to consultation that is required under Section 42 and Section 47 of the Planning Act 2008 with the relevant consultation bodies and the public on the preliminary environmental information.
<b>Temporal Scope</b>	The temporal scope covers the time period over which changes to the environment and the resultant effects are predicted to occur and are typically defined as either being temporary or permanent.
<b>Temporary or permanent effects</b>	Effects may be considered as temporary or permanent. In the case of wind energy development the application is for a 30 year period after which the assessment assumes that decommissioning will occur and that the site will be restored. For these reasons the development is referred to as long term and reversible.
<b>TMZ</b>	Transponder Mandatory Zone

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<b>Term (acronym)</b>	<b>Definition</b>
<b>The Applicant</b>	Rampion Extension Development Limited (RED)
<b>TMZ</b>	Transponder Mandatory Zone
<b>UK</b>	United Kingdom
<b>Uncontrolled Airspace</b>	Defined airspace in which Air Traffic Control does not exercise exclusive authority but may provide basic information services to aircraft in radio contact. In the UK, Class G is uncontrolled airspace.
<b>WTG</b>	Wind Turbine Generator
<b>Zone of Influence (Zoi)</b>	The area surrounding the Proposed Development which could result in likely significant effects.

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