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# Norwich to Tilbury

## Volume 6: Environmental Statement

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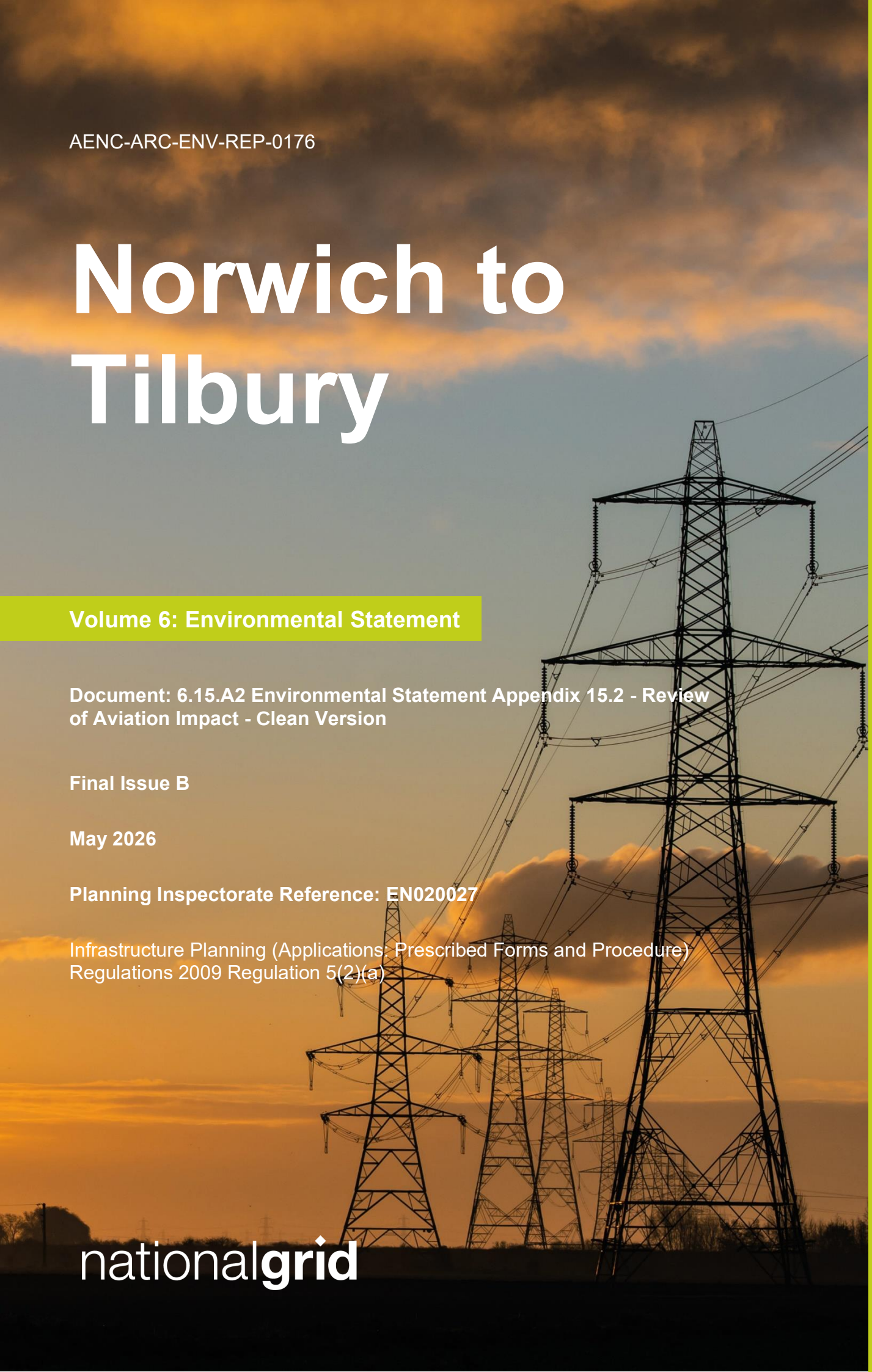

nationalgrid

# Revision History

| Version | Date | Submitted at |
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# Contents

# 15. Review of Aviation Impact

## 15.1 Introduction

15.1.1 This appendix has been produced to support Chapter 15: Socio-economics, Recreation and Tourism (document reference 6.15) of the Environment Statement (ES) (Volume 6 of the DCO application) for Norwich to Tilbury (the 'Project') and presents a review of aviation impacts assessed for the Project.

15.1.2 The document draws on the findings of Alan Stratford and Associates Ltd (ASA), appointed by National Grid as independent specialist aviation planning consultants with substantial expertise in operational safeguarding evaluation at aerodromes across the UK.

15.1.3 It provides a review of the potential impacts of the Project on aviation, focusing on (but not limited to) civil aerodromes within its vicinity, as well as military aviation, defence interests, meteorological assets, and communications, navigation and surveillance (CNS) infrastructure, in accordance with national policy requirements.

15.1.4 National Grid's risk-based site-specific assessment methodology is described, enabling the consideration of multiple factors within bespoke assessments for individual aerodromes potentially impacted by the Project. Compliance with aviation sector-specific regulation and guidance is explained as the basis for the objective and robust approach.

15.1.5 The document summarises how National Grid has consulted and collaborated with aviation stakeholders, including aerodrome operators, to inform its methodology and impact assessment conclusions.

15.1.6 The conclusions of this document demonstrate that aviation impacts have been appropriately assessed and addressed by National Grid, and the Project is designed to minimise adverse impacts, where possible, to ensure the ongoing safe operation of aviation uses.

## 15.2 Planning Policy and Regulatory Context

### Overview

15.2.1 This section sets out the regulatory and planning policy context considered for the assessment of aviation impacts in relation to the Project. The Overarching National Policy Statement for Energy (EN-1) (Department for Energy Security and Net Zero, 2024), taken together with the National Policy Statement for Electricity Networks Infrastructure (EN-5) (Department for Energy Security and Net Zero, 2024), provides the primary policy for decisions taken by the Secretary of State (SoS) in applications for electricity networks infrastructure. It is recognised that account may be taken of the provisions of the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2025) relating to aviation, and any relevant supplementary Planning Practice Guidance (PPG).

15.2.2 Aviation-specific regulation and guidance, where considered to be relevant to the development of a robust and objective methodology for the assessment of potential aviation impacts associated with the proposed development, is also described.

## National Planning Policy

### Overarching National Policy Statement for Energy (EN-1)

15.2.3 Section 5 of EN-1 recognises aviation amongst generic impacts that may arise from the development of energy infrastructure. More specifically, section 5.5 of the NPS reflects that all aerodromes, both civil and military, as well as aviation technical sites, meteorological radars and other types of defence interests can be affected by new energy development. The policy emphasises the need for collaboration and co-existence between aviation, defence and energy industry stakeholders to ensure that aviation-related safety, operations and capabilities are not adversely impacted by new energy infrastructure, with the reciprocal need for aviation stakeholders to work collaboratively with energy infrastructure developers essential for net zero. Whilst the important economic and social benefits of aerodromes are recognised, including at the local and regional level, it is stated that aerodrome needs must be balanced with the urgent need for new energy developments, which bring about a wide range of social, economic and environmental benefits.

15.2.4 The NPS recognises varied safeguarding statuses and associated procedures, including for officially safeguarded civil aerodromes, selected on the basis of their importance to the national air transport system, as well as military aerodromes, defence surveillance sites, and other defence assets. The policy refers to ‘obstacle limitation surfaces’ (OLS), areas of airspace around aerodromes defined according to Civil Aviation Authority (CAA) (Civil Aviation Authority, 2022) or Ministry of Defence (MOD) criteria, a process which must be complied with by all civil aerodromes certified or licensed by the CAA and all military aerodromes. OLS definition through the development of safeguarding maps is recommended for aerodrome operators (both licensed and unlicensed) to establish consultation procedures to ensure prospective developers are aware of the presence of an aerodrome and any associated concerns regarding f obstacles or activities that may present a hazard to aircraft operations. EN-1 emphasises that the CAA makes clear the responsibility for the safeguarding of General Aviation (GA) aerodromes lies with the aerodrome operator.

15.2.5 In addition to aerodrome safeguarding, EN-1 refers to the potential for new energy infrastructure to cause obstructions in MOD low flying areas, stating the need for a balance to be struck between defence and energy needs in these locations. Furthermore, the policy recognises that energy infrastructure development may interfere with the operation of communications, navigation and surveillance (CNS) infrastructure, including radar. It states that applicants should provide relevant information on proposed developments to enable CNS owners/operators to consider appropriate mitigation solutions. The official safeguarding of Met Office-operated weather radar, ensuring consultation to mitigate potential adverse impacts on radar signals, is also referenced.

15.2.6 EN-1 places an expectation on Development Consent Order (DCO) applicants to consult the MOD, Met Office, CAA, National Air Traffic Services (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. In addition to considering operational impacts, it states that assessments should take account of factors including bird strike risk, building induced turbulence and any cumulative effects with other relevant projects.

15.2.7 With regards to mitigation, EN-1 states that an applicant should include appropriate mitigation measures as an integral part of the proposed development and recognises that OLS infringement mitigations may include agreed changes to aerodrome operational procedures, the installation of obstacle lighting and/or via notification in Aeronautical Information Service publications. Potential mitigations for CNS infrastructure and the UK military Low Flying systems are listed to include operational airspace changes, infrastructure upgrades and the introduction of radar mitigation technology. The policy recognises that mitigation for effects on meteorological radar and CNS systems may include reducing the scale of a project, although it is acknowledged this is likely to be unreasonable for the SoS to require.

15.2.8 In relation to decision making, the policy makes clear that the SoS should be satisfied that the effects on meteorological radars, civil and military aerodromes, aviation technical sites and other defence assets or operations have been addressed by the application, and that any necessary assessment of the proposal on aviation, weather-related or defence interests has been carried out. Paragraph 5.5.50 of EN-1 states that *'the SoS should be satisfied that the proposal has been designed, where possible, to minimise adverse impacts on the operation and safety of aerodromes, and that realistically achievable mitigation is carried out on existing surveillance systems….'*

15.2.9 EN-1 states it is incumbent on operators of aerodromes to regularly review the possibility of agreeing to make reasonable changes to operational procedures. When assessing the necessity, acceptability, and reasonableness of operational changes, the SoS should be satisfied that they have the necessary information regarding the operational procedures along with any demonstrable risks or harm of such changes, taking into account the cases put forward by all parties. The policy recognises that the SoS may consider the use of 'Grampian conditions' to mitigate significant impact on civil or military aviation, meteorological radars, defence assets or military training.

15.2.10 The NPS states that, after reasonable mitigation, operational changes, obligations and requirements have been proposed, the SoS should consider a range of residual impacts including the prevention of a licensed aerodrome maintaining its licence, substantial local or national economic loss, and harm to training or emergency service needs. Finally, it is stated that, provided the SoS is satisfied that the impacts of the proposed energy development do not present risks to national security and physical safety, and where they do, provided the SoS is satisfied that appropriate mitigation can be achieved, or appropriate requirements can be attached to any DCO to secure those mitigations, consent may be granted.

### National Policy Statement for Electricity Networks Infrastructure (EN-5)

15.2.11 Section 2 of EN-5 provides policy on impacts to be considered, in addition to the generic impacts detailed in EN-1, when evaluating the impacts of electricity networks infrastructure. Of potential relevance is the production of electric and magnetic fields (EMFs) by overhead lines and underground cables (UGC) associated with electricity transmission. Paragraph 2.11.14 states that, in order to avoid unacceptable adverse impacts of EMFs from electricity network infrastructure on aviation, the SoS will take account of statutory technical safeguarding zones defined in accordance with Planning Circular 01/03 (Department for Transport, 2016), or any successor, when

considering recommendations for DCO applications. Further detail within Section 5.5 of EN-1 is also referenced. The Circular describes arrangements for safeguarding, as well as requirements for consultation with the SoS for Defence and the CAA in relation to applications for overhead lines, and the listing of officially safeguarded civil aerodromes.

### National Planning Policy Framework

15.2.12 Section 9 of the NPPF relates to sustainable transport, with references to planning policy consideration of general aviation airfields at paragraph 111. This recognises the importance of maintaining a national network of general aviation airfields, and their need to adapt and change over time – taking into account their economic value in serving business, leisure, training and emergency service needs, and the General Aviation Strategy (Department for Transport, 2015). The NPPF defines general aviation airfields as licensed or unlicensed aerodromes with hard or grass runways, often with extensive areas of open land related to aviation activity.

15.2.13 Paragraph 12 of PPG entitled 'Transport evidence bases in plan making and decision taking' (Ministry of Housing, Communities and Local Government, 2015) recognises the significant contribution of aviation to economic growth, including in relation to small and medium sized airports and airfields (aerodromes). The guidance advises Local Planning Authorities (LPAs) to have regard to the extent to which an aerodromes contributes to connectivity as part of a network, including beyond an LPA's own boundaries, as well as to the Aviation Policy Framework (Department for Transport, 2013), which sets out government policy to allow aviation to continue making a contribution to economic growth.

## Aviation Regulation and Related Guidance

15.2.14 The Air Navigation Order (ANO) 2016 (as amended) (UK Government, 2016) is the statutory instrument that establishes UK regulations for civil aviation matters, including safety management. The ANO requires that, in the UK, flights for the public transport of passengers, and for certain types of flying instruction, take place at a certified, licensed or government (military) aerodrome. The minimum standards for certified aerodromes are established in Aerodromes UK Regulation (EU) 139/2014 (UK Civil Aviation Authority, 2025) but are not directly relevant as no certified aerodromes have been identified within the scope for assessment (see Section 15.3). Regulatory Article (RA) 3512 (Ministry of Defence, 2023) is relevant to military aerodromes (such as Wattisham Flying Station, see Table A15.2.1) and addresses OLS definition requirements.

### CAP 168: Licensing of Aerodromes

15.2.15 For licensed aerodromes, the CAA's CAP 168 publication (Civil Aviation Authority, 2022) describes the minimum standards necessary to meet licensing requirements. These include the physical runway characteristics and the defined OLS. CAP 168 describes the method for assessing the significance of objects within the vicinity of aerodromes via the definition of OLS particular to a runway and its use. It recognises that whilst ideally all surfaces would be free from obstacles, the CAA's consideration of infringement will have regard to multiple factors including the nature of the obstacle and its location relative to the surface origin, runway centrelines, approach and departure paths and existing obstructions. The degree of infringement, gradients presented by the obstacle to the surface origin, the type of air traffic and published

instrument approach procedures are also listed to be relevant. CAP168 further recognises potential safety measures to include the promulgation of appropriate information in the UK Aeronautical Information Publication (AIP), marking and/or lighting of an obstacle, limitation to the use of runways, or restriction to the type of traffic.

### CAP 738: Safeguarding of Aerodromes

15.2.16 The CAP 738 publication (Civil Aviation Authority, 2020) provides detailed advice and guidance on aerodrome safeguarding to certified, licensed and non-licensed aerodromes, heliports and hospital helicopter landing sites (HHLS) in satisfaction of International Civil Aviation Organisation (ICAO), European Union (EU) and National Regulations. It states the aim of all safeguarding is to assess the implications of any development being proposed within the vicinity of an established aerodrome to ensure, as far as practicable, that the aerodrome and its surrounding airspace are not adversely impacted by the proposal, and the continued safety of aircraft operating at the location.

15.2.17 CAP 738 addresses matters including aerodrome operator accountability for safeguarding, and procedures for ensuring involvement in the planning consultation process, as well as detailed guidance to enable assessment of OLS infringement, impacts on Instrument Flight Procedures (IFP), wildlife or building induced turbulence hazards, and impacts on the performance of aeronautical communications, navigation and surveillance systems.

### CAP 793: Safe Operating Practices at Unlicensed Aerodromes

15.2.18 The stated aim of the CAP 793 publication (Civil Aviation Authority, 2010) is to provide guidance and advice to the owners and operators of unlicensed aerodromes (including helicopter landing sites and aerodromes used for flying training) to enable safe operating practices to be met. It recognises that whilst the physical characteristics required of a certified or licensed aerodrome may not be necessary for safe operation of every type of aircraft, they can be used as guidance on which the layout of an unlicensed aerodrome may be based. In particular, the guidance states that runways should, wherever possible, be designed such that power lines or other obstacles do not obstruct their approach and take off paths and recommends that there are no obstacles greater than 150 ft above the average runway elevation within 2,000 m of the runway mid-point.

## 15.3 Scope of the Assessment

### Overview

15.3.1 The scope of the aviation impact assessment has been informed by national planning policy requirements as described within Section National Planning Policy, and aviation sector-specific regulations and guidance as described within Section Aviation Regulation and Related Guidance. In accordance with EN-1, the assessment considers potential impacts of the Project on a range of aviation interests, including: civil aviation aerodromes (certified, licensed and non-licensed) used by fixed wing, rotary, unpowered and unmanned aircraft; military aerodromes, air systems and aviation-related defence assets (including low flying areas and radar), and; other CNS or weather-related infrastructure.

15.3.2 The aviation consultants appointed by National Grid possess specialised expertise within the field of civil aviation. The assessments of defence, CNS and meteorological interests have however been dependent on formal consultation and stakeholder-led impact assessments.

15.3.3 The proposed Project's overhead line and associated infrastructure are recognised to represent a new obstacle within the proximity of aerodromes. The principal aim of the assessment is, therefore, to evaluate safety, operational and capability impacts arising as a result of potential aircraft collision with or avoidance of the obstacle (the Project). Potential impacts resulting from Project-derived bird strike hazard, building induced turbulence and electromagnetic forces are considered, along with cumulative impacts potentially culminating from existing or proposed electricity network infrastructure in the vicinity.

## Assessment Approach and Methods

15.3.4 This section sets out the methodology used for assessing the effects of the Project on aviation interests.

### Data Source

15.3.5 The baseline assessment has been informed by desk studies which have drawn on the following key information sources:

- Mapping and topographical data including from Geographic Information System (GIS), Google Earth and Ordnance Survey sources
- Visual Flight Rules (VFR) aeronautical charts and flight planning software (SkyDemon)
- Published aviation information relating to specific aerodromes, runways and operational procedures (aerodrome websites, Pooleys Flight Guide (Pooleys, 2025)
- Aircraft performance statistics (including data from aircraft operating manuals, CAA flight test data)
- Stakeholder feedback, including from aerodrome owners and operators, as well as professional aviation bodies, see Section Specific Aerodrome Assessment Conclusions for more details on specific engagement.
- Light Detecting and Ranging (LiDAR) data gathered in September 2023, and online Digital Terrain Model (DTM) data.

### Study Area

15.3.6 The Aviation Impact Study Area baseline is defined as land within a 5 km straight-line radius distance from the Project's overhead line section and was used to identify aerodromes potentially impacted by the Project. A 2 km radius distance was initially proposed, based on the professional judgement of the appointed aviation consultants that aviation impacts were most likely to arise from aerodromes within 2 km of the overhead line as related aircraft take-off and approach procedures would be taking place in the vicinity. This distance also responds to the generic CAP 793 recommendation for runway positioning to avoid obstacles greater than 150 ft above the average runway elevation within 2 km of the runway mid-point.

15.3.7 The assessment Study Area was expanded to 5 km radius in response to statutory consultation feedback, including from the CAA's Airfield Advisory Team (AAT), now disbanded, and is now consistent with the 10 km-wide corridor parameter used by the AAT to independently identify aerodromes potentially impacted by the Project.

15.3.8 21 aviation sites have been identified within the Study Area, including a military aerodrome, two helipads and a model aircraft club (to note also para. 3.2.7). The remaining sites are non-licensed civil aerodromes, assessed to meet the NPPF definition of General Aviation (GA) airfields. Of these, two are no longer operational. Furthermore, two aerodromes are currently used for gliding activities. Additional considerations for helicopter and gliding operations are further explained within individual aerodrome impact summaries (see Section 15.4).

Table A15.2.1 Identified Aerodrome within 5 km of the Project

| Aerodrome | Status / Type | Distance to Overhead Line Alignment (m) | | | |
|---|---|---|---|---|---|
| | | From Closest Point of Runway | | | From Runway End (Straight-line flight path) |
| | | IR04[1] | IR05[2] | DCO[3] | DCO |
| Barnards Farm (West Horndon) | General Aviation | Option A= 1737<br>Option B= 1737 | 1737 | 1737 | 1748 |
| Boxted | Not operational | Option A= 555<br>Option B= 555 | 555 | 555 | 602 |
| Brock Farm (Napps Field) | Not operational | Option A= 1528<br>Option B= 747 | 714 | 712 | 713 |
| Brook Farm | General Aviation | Option A= 555<br>Option B= 555 | 578 | 1224 | 1642 |
| Broomfield Hospital | Helipad | Option A= 1025<br>Option B= 1025 | 1026 | 1026 | N/A Helipad |
| Chase Farm | General Aviation | Option A= 402<br>Option B= 402 | 402 | 312 | 595 |
| Crowfield | General Aviation | Option A= 3843<br>Option B= 3843 | 3851 | 3884 | 4639 |
| Dysons Farm | Helipad | Option A= 643<br>Option B= 643 | 643 | 643 | N/A Helipad |
| Elmsett | General Aviation | Option A= 2225<br>Option B= 2961 | 2951 | 2951 | 2975 |
| Garnons Farm | General Aviation | Option A= 3076<br>Option B= 3076 | 3076 | 3076 | 10984 |

[1] IR04 – The 2023 preferred draft alignment, subject to non-statutory consultation in 2023

[2] IR05 – The 2024 preferred draft alignment, subject to statutory consultation in 2024

[3] DCO – The proposed Development Consent Order overhead line alignment

| Aerodrome | Status / Type | Distance to Overhead Line Alignment (m) | | | |
|---|---|---|---|---|---|
| | | From Closest Point of Runway | | | From Runway End (Straight-line flight path) |
| | | IR04[1] | IR05[2] | DCO[3] | DCO |
| Hinderclay Meadows | General Aviation | Option A= 5404<br>Option B= 5404 | 4807 | 4807 | 16309 |
| Laindon (Bensons Farm) | General Aviation | Option A= 3856<br>Option B= 3856 | 3856 | 3706 | 4355 |
| Long Stratton | General Aviation | Option A= 3061<br>Option B= 3061 | 3081 | 3076 | 4519 |
| Nayland | General Aviation | Option A= 4558<br>Option B= 4558 | 4558 | 4558 | 5050 |
| Priory Farm | General Aviation | Option A= 723<br>Option B= 723 | 723 | 723 | 3091 |
| Raydon Wings | General Aviation | Option A= 1072<br>Option B= 257 | 272 | 272 | N/A no overflight |
| Tacolneston (South Norfolk Model Aircraft Club) | Model Aircraft | Option A= 156<br>Option B= 156 | 200 | 412 | 515 |
| Thurrock | General Aviation | Option A= 1013<br>Option B= 1013 | 988 | 870 | 998 |
| Tibenham (Norfolk Gliding Club) | General Aviation (Gliding) | North = 1762<br>South = 1771 | 1762 | North = 1773<br>South = 1771 | North = 2016<br>South = 2060 |
| Wattisham Flying Station | Military | Option A= 2384<br>Option B= 2384 | 2384 | 2399 | 7709 |
| Wormingford (Essex and Suffolk Gliding Club) | General Aviation (Gliding) | Option A= 2277<br>Option B= 2277 | 2277 | 2277 | N/A no overflight |

15.3.9 The potential for aerodromes to be located beyond the Study Area, but to have safeguarding areas infringed by the Project is recognised, and realised in the instance of Old Buckenham Airfield. The former Royal Air Force (RAF) station and now licensed civil aerodrome was identified as located approximately 6 km from the overhead line and has a defined 13 nautical miles (24 km) safeguarding area within which all proposed developments above 15 m in height are subject to engagement with the operator. Engagement with the operator has established that the overhead line will not impact operational activities of the aerodrome. No other aerodromes beyond the Study Area with defined safeguarding areas likely to be infringed by the Project have been identified.

### Model Aircraft

15.3.10 The Tacolneston site associated with South Norfolk Model Aircraft Club is included within Table A15.2.1 and the impact assessment as it was identified as located approximately 150 m from the 2024 preferred Project alignment. The CAA's CAP 2320: Drone and Model Aircraft Code (Civil Aviation Authority, 2024) requires unmanned aircraft to be flown at a minimum of 150 m from residential, recreational, commercial and industrial sites. Three other model aircraft clubs (Raydon & District Model Aircraft Club, Chelmsford Model Flying Association, and Ospreys Model Aircraft Club) have flying fields within 5 km of the Project alignment but significantly beyond the minimum 150 m separation distance and have been excluded from the assessment on that basis.

### Hot Air Ballooning

15.3.11 Six balloon sites have been identified within 5 km of the Project's proposed alignment, including two (at Ardleigh Showground / Prettyfield Vineyard) within approximately 200 m of the Project alignment. It is recognised that whilst commercial balloon operations may require CAA and landowner permission, they need no ground infrastructure. The viability of balloon launches at a particular site depends crucially on the wind conditions at the time and during engagement, operators have advised they can re-locate to alternative sites within the local area in response to prevailing wind conditions.

## Project Engagement and Consultation

15.3.12 In accordance with EN-1 requirements, National Grid has sought to consult with the CAA, Met Office, MOD, NATS, as well as the owners and/or operators of aerodromes identified within the Study Area and therefore potentially impacted by the Project, see Section Specific Aerodrome Assessment Conclusions for more details on specific engagement.

## Civil Aerodromes

15.3.13 As per EN-1, National Grid recognises the responsibilities of General Aviation aerodrome operators for safeguarding, and the importance of engagement to ensure their operational activities, as well as any safeguarding concerns, are understood and appropriately considered within impact assessments and the development of the Project's design. Engagement with operators has entailed in-person and site visits, as well as online meetings and telephone and email communication, as part of and in addition to non-statutory, statutory and targeted consultation procedures. Operator representations have prompted design change appraisals and resulted in modifications to the Project's design in several instances, to minimise potential impacts. Statements of Common Ground (SoCG) have been sought with operators and agreed in some cases. Engagement to confirm the acceptability of the design and/or agree reasonable alternative or additional mitigations, including potential changes to aerodrome operational procedures, is ongoing with other operators.

15.3.14 As a prescribed consultee, National Grid formally notified the CAA of the statutory consultation period. It was understood, however, in view of the non-licensed General Aviation aerodromes in scope that any response would be limited as the CAA's regulatory responsibilities relate to licensed and officially safeguarded civil aerodromes, which were not identified in the Study Area. Furthermore, CAP 738

recognises that the CAA is not involved in the safeguarding process for individual cases and does not hold a view on safeguarding at non-licensed sites.

15.3.15 National Grid and its appointed aviation consultants have consulted with the CAA's AAT, a separate body whose remit was to provide advice to support licensed and non-licensed aerodrome operators in their own responsibilities for safeguarding. In addition to informing development of Study Area parameters, engagement with the CAA AAT, as well as consideration of relevant regulations and CAA guidance publications, emphasised the importance of nuanced site-specific assessments, evaluating multiple risk factors within each aerodrome's unique environment, not focusing solely on proximity to the proposed alignment of the Project. This principle is further explained within the assessment methodology description. The CAA AAT's provision of 'horizon scanning' assessments enabled peer review, and verification of National Grid assessments for the majority of civil aerodromes in scope.

15.3.16 In response to its consultation feedback relating to the Project and specific aerodromes potentially impacted, and recognising particular impact considerations regarding gliding activities, National Grid has engaged the British Gliding Association (BGA) regarding the development of guidance relevant to electricity transmission projects in general and the importance of aerodrome operator consultation therein.

15.3.17 National Grid has also engaged with the General Aviation Awareness Council (GAAC), an advisory body to GA aerodromes in relation to planning and property matters. The GAAC has provided feedback on the Project consultation approach and assessment methodology.

### Military Aerodromes, Defence Assets, CNS and Meteorological Infrastructure

15.3.18 Consultation with the operator of the military aerodrome Wattisham Flying Station (WFS) and the MOD Defence Infrastructure Organisation (DIO) confirmed the proposed alignment of the Project infringed the statutory safeguarding zones surrounding the aerodrome, and identified a potential conflict of interest between the Project and the safeguarding criteria for the aerodrome's STAR NG radar.

15.3.19 DIO consultation further identified the Project's infringement of the statutory safeguarding zone surrounding the East 2 WAM Network, specifically the North WAM technical asset related to air traffic services. The proposed Project alignment was also confirmed to fall within MOD Low Flying Areas (LFA) 5 and 10, within which military aircraft may conduct low level flight training. National Grid's continued engagement with the WFS operator and the DIO recognises the need for MOD assessment of potential impacts on the identified military assets, appropriately informed through the provision of detailed Project design information. With respect to the confirmed impact of the Project as an obstacle within LFAs 5 and 10, the DIO has advised that the MOD will require a condition to any consent issued requiring that sufficient data is submitted to ensure Project structures can be accurately charted to enable deconfliction with military aviation (commitment S06 of the Outline CoCP (document reference 7.2)). National Grid has confirmed to the DIO that it intends to support this requirement.

15.3.20 Consultation with the Met Office identified the proposed alignment of the Project would infringe the safeguarding zone of a new meteorological radar (currently under construction) within the vicinity of Old Buckenham. National Grid's sharing of detailed design information enabled the Met Office's subsequent assessment of potential impacts and consideration of reasonable mitigations.

15.3.21 Consultation with NATS has confirmed that their assets would not be impacted by the Project and have been scoped out of the assessment on this basis.

## Assessment Methodology

15.3.22 The National Grid methodology has been developed to enable site-specific impact assessments for aerodromes within the Study Area. Its primary aim is to evaluate risks of collision, predominantly during take-off and approaches and including forced landing due to engine failure risks, with the Project's proposed overhead line alignment representing a new obstacle within proximity of aerodromes. Operational safety impacts arising from potential increases to risks of bird strike, wind turbulence and electromagnetic forces as a result of the Project are also considered.

15.3.23 The methodology responds to the CAA's CAP 793 guidance recommending that obstacles over 150 ft should not be sited within a radius of 2,000 m of the aerodrome centre point. This recommendation broadly corresponds with the CAP 168 definition of the Inner Horizontal Surface (IHS) for a Code 1 licensed runway, equating to an approx. 2.5% take off and approach slope at a small airfield. It is noted, however, that the CAP 793 measure does not distinguish where an obstacle is in relation to a runway or the impact of the combination of obstacle height and location. Furthermore, it does not consider aircraft performance, runway length or the potential flight paths at the individual aerodromes assessed. The nature of the obstacle (i.e. whether it is a single, isolated object or a group or line of objects) is also not considered. With this in mind, and in agreement with the CAA AAT advised approach, the developed National Grid methodology enables a nuanced appraisal that considers multiple risk factors in addition to the height and location of the Project relative to the aerodrome, including: runway length and orientation in relation to the overhead line; aircraft performance, flight paths and established operational procedures, and the surrounding context in terms of topography and existing obstacles (including other overhead lines).

15.3.24 In assessing the location of the Project's proposed overhead line alignment relative to an aerodrome, the methodology enables evaluation of whether there is sufficient distance available from the runway end on take-off and on approach either to overfly the overhead line with an appropriate clearance margin or to turn to avoid the overhead line. In determining this, the assessment considers what flight procedures are appropriate for safe light aircraft operations, taking account of operator feedback and published performance characteristics for the types of aircraft using the aerodrome, as well as the height of the overhead line (accounting also for the surrounding topography). This enables the determination of the dimensions of protected airspace necessary for safe operations, which may not have been previously defined or detailed by the operator. It is recognised that aircraft performance can be adversely affected by runway conditions, high ambient temperatures, pilot technique, local winds and by increased weight being carried. The assessment incorporates sufficient lateral and vertical clearance margins within the proposed protected airspace at these aerodromes to address these variables under all flyable conditions.

15.3.25 Sensitivity testing has been undertaken to determine if any local design changes within the limits of deviation ('LoD') or if any of the design scenarios presented in Table 4.4 in Chapter 4: Project Description of the Environmental Statement (document reference 6.4) would result in any different conclusions to those summarised in this assessment document.

## Key Parameters for Assessment and Assumptions

15.3.26 Initial assessments undertaken during the early stages of the design of the Project assumed that the overhead line was a horizontal line (without catenary) between pylons of a fixed height – nominally 55 m (180 ft) above local ground level. Subsequent assessments are based on specific proposed pylon heights/ locations (as per the Project LoD including the table of parameters in the Works Plans (document reference 2.3) within the vicinity of aerodromes. Allowances within the assessment model allow for some deviation from the proposed pylon heights and locations whilst recognising that variation will likely result in minimal changes to impact assessment conclusions, considering the overall distances between the Project and most aerodromes potentially impacted.

15.3.27 The assessment considers, for all civil aerodromes in scope, whether the Project alignment infringes Obstacle Limitation Surfaces (OLS) as defined under the CAA's CAP 168 regulations for licensed aerodromes, introducing a standardised and objective measure, recognising this to be best practice for obstacle assessment and treatment, albeit not a regulatory requirement for unlicensed aerodromes. CAP 168 reflects that OLS definition is intended to create a degree of freedom from obstacles around a runway, affording aircraft a safe space to manoeuvre. If calculated clearance margins and take-off/landing slopes meet CAP168 standards for obstacle treatment, the Project's proposed overhead line alignment is considered to have an acceptable impact on the aerodrome's operations and no further design changes to minimise impact are likely to be justified.

15.3.28 More specifically, the assessment methodology incorporates a range of assumption parameters regarding take-offs and approaches by different aircraft performance classes, including minimum clearance margins (vertical - 30 m or 100 ft within a 5.5° horizonal spray from the runway centreline; lateral – 150 m when the aircraft is at or below the height of the proposed overhead line alignment) and maximum gradient angles (4° and 5°, subject to aircraft). Curved approaches and turns after climb-out to avoid the overhead line are considered in preference to straight-ahead departures and approaches over the Project overhead line alignment.

15.3.29 Further detail on the consideration of risk factors within the methodology is provided below.

## Aircraft Performance Analysis

15.3.30 The types of aircraft typically flown at General Aviation aerodromes were considered within four categories and an indicative aircraft model was used as a basis for the performance of all aircraft models within each category. It was recognised that some aerodromes may handle several categories of aircraft, although others may be limited by runway length or may just be used by a single based aircraft. Although there is some variation in aircraft performance between the different models in each category, this is considered to be relatively minor and, given the additional safety margins in our calculations of the safe operating distances, we consider this to be an appropriate basis for our analysis.

15.3.31 The four categories of aircraft together with the illustrative aircraft model and other common models are shown in Table A15.2.2 below. Based largely on information provided by operators, they are considered to represent the majority of types flown from the airfields and airstrips evaluated. It is acknowledged that these types may change in future years, particularly as a result of the introduction of electric-powered light aircraft. At present, the only fully electric aircraft with type certification in the UK

is the Pipistrel Velis Electro, which is a microlight. It has similar performance characteristics to other microlight aircraft, and we have included it in this category. To ensure the assessment is future-proofed, it is suggested reasonable to assume that any electric aircraft types would have similar or better performance to microlights or possibly higher performing piston-engine aircraft. It should also be noted that there is no statistical data available on actual or expected engine failure rate for a Pipistrel Velis Electro. However, it is assumed that the likelihood of a forced landing for electric aircraft is similar to or less than single piston-engine aircraft.

Table A15.2.2 Aircraft Performance Categories - Illustrative Aircraft Types

| Aircraft group and illustrative model | | Other Common models |
|---|---|---|
| Higher performance single-piston engine light aircraft<br>(Piper PA28) |  | Cessna 172/152<br>Cirrus SR20<br>Diamond DA40<br>VANS RV8 |
| Lower performance/ older single-piston engine light aircraft<br>(Auster J1N) |  | Rallye-MS880<br>Piper Cub<br>Beagle Pup<br>Tiger Moth<br>DHC-1 Chipmunk |
| Microlights and Autogyros<br>(Ikarus C42) |  | Eurostar<br>SportsCruiser<br>Skyranger<br>Rans S6<br>Quik GT 450 (Flex Wing)<br>Pipistrel Velis Electro |
| Glider/ tug aerotows<br>(Eurofox 141 HP) |  | Quantum 912<br>Robin DR400 |

15.3.32 The aircraft performance data that has informed calculations on the airspace and distance required between the overhead line and the nearest runway end at the airfields and airstrips assessed is shown in Table A15.2.3.

Table A15.2.3 Aircraft Performance Data

| Performance characteristic | | Low performance aircraft | High performance aircraft | Microlights | Glider/tug (Aerotow) |
|---|---|---|---|---|---|
| **Illustrative model** | | **Auster J1N** | **PA28** | **Ikarus C42** | **Eurofox 141 HP** |
| KIAS (Vy) (Ground speed) | mph | 75 | 85 | 70 | 60 |
| | knots | 65 | 74 | 61 | 52 |
| | metres/min | 2,012 | 2,280 | 1,877 | 1,609 |
| Approach speed | mph | 69 | 80 | 63 | n/a |
| | knots | 60 | 70 | 55 | n/a |
| | metres/min | 1,852 | 2,160 | 1,697 | n/a |
| Rate of climb (RoC) | ft/min | 500 | 690 | 590 | 450 |
| | metres/min | 152 | 210 | 180 | 137 |
| Angle of climb | degrees | 4.3 | 5.3 | 5.5 | 4.9 |
| Turn radius (climb) (max 150 bank) | ft | 1,408 | 1,808 | 1,226 | 901 |
| | metres | 429 | 551 | 374 | 275 |
| Turn radius approach (max 200 bank) | ft | 1,036 | 1,331 | 903 | 663 |
| | metres | 316 | 406 | 275 | 202 |
| Angle of approach (Opt. 1) | degrees | 4.0 | 4.0 | 4.0 | n/a |
| Angle of approach (Opt. 2) | degrees | 5.0 | 5.0 | 5.0 | n/a |

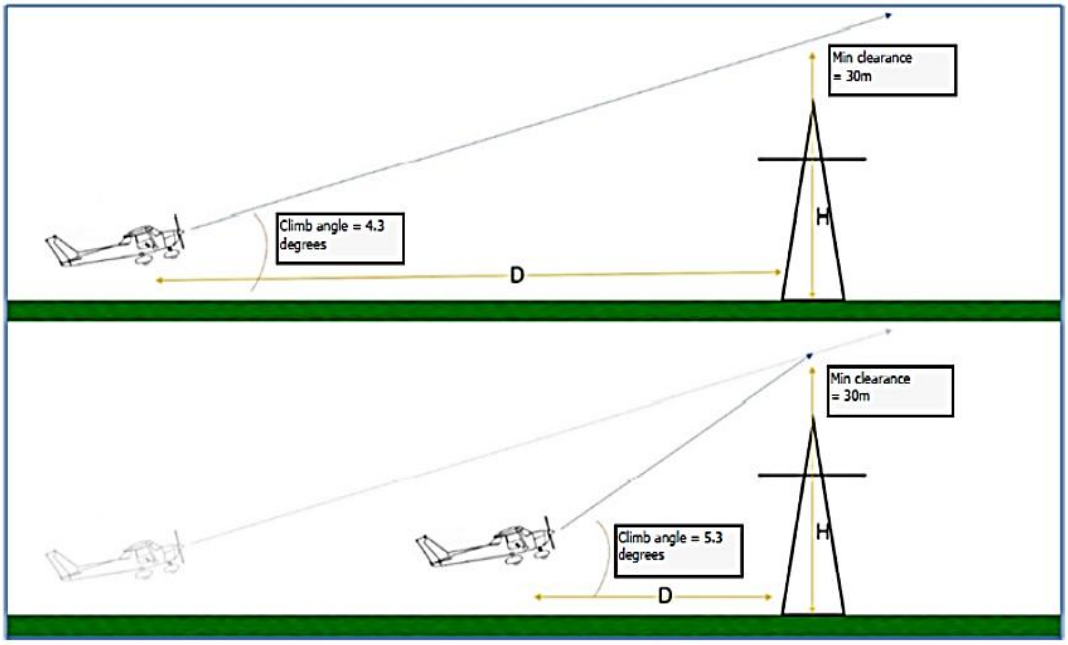
15.3.33 Table A15.2.3 illustrates that the minimum overhead line distance requirements for higher and lower performance single piston engine aircraft are broadly similar. Although higher performance aircraft have a steeper climb rate in comparison to lower performance aircraft, they have a larger turn radius due to their speed.

15.3.34 An assumption is that it is preferable for aircraft to turn on departure and make a curved approach to avoid the overhead line altogether, as it eliminates the possibility of a collision with the overhead line during a forced landing. In this instance, the height of the overhead line is less significant than its distance from the runway, but a greater distance between the runway threshold and the overhead line is required. It is recognised, however, that some pilots may prefer to overfly the overhead line in order, for example, to be established on the runway centreline for approach. On this basis, the minimum distance requirements from the overhead line to the take-off or touchdown point are dependent on the overhead line pylon height and the climb and approach gradients, as shown in Table A15.2.3. Assuming that aircraft turn by 90° to avoid the overhead line, a minimum distance of around 1,350 m between the runway

threshold and the overhead line, would allow flexibility for different types of aircraft and flight procedures at most airfields. This figure could be reduced to approximately 1,230 m with a 45° turn to avoid the overhead line. At smaller airstrips only handling microlight aircraft, a lower figure (around 925 m dependent on runway length) could be sufficient with straight-ahead flight departures and a 5° (or steeper) approach over a 55 m overhead line and is considered to be a practical lower limit for the location of an overhead line in relation to a runway centreline.

15.3.35 An illustration of a climb-out over the overhead line by high and low performance single piston engine aircraft is given in Image A15.2.1 below.

Image A15.2.1 Climb-out over Overhead Line - Low and High Performance Single Piston Engine Aircraft




15.3.36 The typical aircraft climb rates by performance class have been used to estimate the likely range of overhead line clearances that would be achieved for those aerodromes where take-offs over the overhead line are likely to be preferred. The overhead line clearances have also been calculated for a 4° approach. With the exception of Chase Farm Table A15.2.6 refers) for all aerodromes assessed, these exceed and, in most cases, substantially exceed the 30 m (100 ft) clearance considered the minimum margin required for safe operations.

15.3.37 The clearances are modelled at International Standard Atmosphere (ISA) conditions in still wind. It is recognised that here may be some variation in clearances achieved due to weather conditions. A range of clearances by aircraft performance types are therefore considered. The aircraft climb rates and the 4° approach angle used can, however, be regarded as typical yet conservative as the model shows that, in practice, higher rates of climb and angles of approach are achieved at airfields (referring to the examples of Peterborough Sibson and Thurrock aerodromes) where there is an existing overhead line close by. The safety records at these sites indicate that there have been no aircraft performance-related or engine failure accidents, which resulted in collision with the overhead line. The accident data suggests that the risk of collision with the overhead line, including that due to pilot error, would be remote or extremely remote provided suitable mitigation measures are in place to promote awareness of the overhead line. In this context, it is noted that there has

been just one accident at Peterborough Sibson and Thurrock over the past 15 years which occurred at Sibson when an aircraft on approach to the displaced threshold collided with the overhead line. The Air Accident Investigation Board (AAIB) report stated that the evidence suggested that the pilot made an approach to the runway end rather than the displaced threshold although unfamiliarity with the airfield, distraction due to a departing aircraft and inadequacies in the briefing material available may have been contributory factors (Air Accident Investigation Branch, 2014).

15.3.38 It is recognised that the overhead line may not be fully visible over the nose of an aircraft on take-off and approach, although it could be seen at either side of the nose. It is important therefore that pilots are made aware of the overhead line as an obstacle both before and during flight.

### Forced Landing Risks

15.3.39 A concern given the proximity of the Project to the airfields and airstrips assessed, is the possibility of an aircraft collision with the overhead line during a forced landing. It should first be recognised that the incidence of a forced landing is comparatively low, and it generally arises as a result of an engine failure on a single-piston aircraft, normally on take-off. In some cases, engine failure may be partial, creating a dilemma for the pilot as to whether to attempt to return to the airfield or to make a forced landing. In terms of the potential severity of the forced landing (i.e. in terms of fatality/injury), there are no reliable statistics which show a difference in risk, based on whether a licensed pilot or a trainee (student) pilot is flying the aircraft.

15.3.40 The likelihood of an engine failure on a single-piston aircraft fitted with the most common engine types is between 1.21 per 10,000 hours i.e. $1.21 \times 10^{-4}$ (with a Continental engine) and 1.27 per 10,000 hours i.e. $1.27 \times 10^{-4}$ (with a Lycoming engine)[4]. The likelihood of a forced landing for any reason is very slightly higher, to take account of all other causes of emergency landing, although this increase is not materially significant. The risk of colliding with an overhead line after such a failure is smaller still, as the aircraft would have to be in a height band where it was too low to glide over the overhead line and too high to land before it, as well as being unable to manoeuvre sufficiently to avoid it.

15.3.41 The procedures outlined above indicate that all aircraft using the airfields and airstrips should ideally turn away from the overhead line as soon as practicable, if overflying it presents an unacceptable risk to the pilot. As a result, it is expected to be possible for the pilot to make a forced landing if required into a suitable clear area and avoid collision with the overhead line. It is theoretically possible that a forced landing might be necessary on approach over the overhead line or perhaps during a circuit overflying the overhead line, although this is much less likely than during take-off. In most instances, however, it is expected to be possible for the pilot to turn to avoid the overhead line. Ultimately, it is necessary to consider the relative severity of a forced landing involving collision with the overhead line as against one where the overhead line is not present.

[4] Aviation Research Statistics AR-2013-107 – Engine failures and malfunctions in light aeroplanes – The Australian Transport Safety Board - 9 March 2016

15.3.42 Several aerodrome operators have expressed concerns about the possible risks of a forced landing into the overhead line. As indicated above, in most instances, this would be avoided by turning on take-off. In other cases, it is accepted that there is a very small risk of collision with the overhead line although, given the low number of hours flown by aircraft using the majority of these airfields and airstrips and the reduced engine failure rate on approach, we regard these risks as acceptable within the standards of light aircraft operations. These risks would increase if the overhead line was crossed on several occasions e.g. during circuits and if there are other hazards e.g. a built-up area or trees which might limit the options for a safe forced landing. In general, given the low likelihood of an engine failure or other emergency arising during a circuit, we do not believe that this risk would be unacceptable, although we would recommend that consideration is given to alternative circuit patterns if they can be established in a manner avoiding the overhead line.

### Other Operational Risks

15.3.43 As indicated in national planning policy and CAA guidance, new infrastructure development should take account of certain other risks to aviation operations including the possible impacts on Instrument Flight Procedures (IFPs), a possible increase in the risks of an aircraft bird strike and possible induced wind turbulence from a new building or other structure.

15.3.44 In addition to the obstacle clearance requirements under Visual Flight Rules (VFR), certain obstacle clearances are also required under CAA-approved Instrument Flight Procedures on approach or departure from an airport or airfield. In practice, however, there are no IFPs in place at any of the aerodromes assessed and it is not anticipated these will be introduced in the future.

15.3.45 The CAA's CAP 772 guidance advised that a new development near an airport or airfield might attract wildlife, particularly birds which might increase the risk of an aircraft bird strike (Civil Aviation Authority, 2017). In relation to the Project, it is anticipated the bird species that might cause the largest threat of aviation collision would be the larger wetland species such swans, geese, ducks and waders. The overhead lines are not considered to attract greater numbers of these species as they are not species that will roost or nest on the overhead lines / pylons. No significant change in the current baseline numbers of these species is expected as a result of the Project.

15.3.46 There is potential for bird species such as pigeons, corvids, starlings (and other passerines / near-passerines) to roost on the overhead lines, sometimes in big flocks. These birds are likely to already be in the area, roosting in other locations. The overhead line is not considered to draw these birds in from a wider area, rather it simply provides an alternative roost site. Therefore, no change in the baseline numbers of these birds is expected. The occasional bird of prey could nest on pylons, and so the proposed pylons may attract these birds to the area as they provide a nesting opportunity that would otherwise be absent. However, nesting raptors have fairly big territories and so large numbers of birds won't be attracted, just the occasional breeding pair. Whilst the likelihood of an aircraft bird strike as a result of the overhead line is very low, it is possible to mitigate this (by the use of bird diverters) should this be a concern near any of the aerodromes close to the overhead line.

15.3.47 We have assessed that the overhead line will not increase the risk of wind turbulence for aircraft on approach or departure from any of the aerodromes within scope. Buildings at or near airfields can, in certain circumstances, produce wind turbulence which can impact flight operations, particularly for smaller aircraft types. For the aerodromes in scope, however, the overhead line would be at a sufficient distance from the flight paths and the structural nature and surfaces of the overhead line pylons are such that it would not generate wind vortices that could impose a threat to aircraft safety.

15.3.48 It has been considered whether EMF from the overhead line might impact aircraft avionics or other aircraft systems, compromising operational safety. It is assessed that minimum clearances allowed for aircraft overflying or otherwise within the vicinity of the overhead line will enable aircraft to be sufficiently distanced to avoid unacceptable adverse effects and is therefore safe. This assessment is justified by National Grid's direct experience of operating aircraft in very close proximity to live overhead lines (within tens of metres), while carrying out routine visual asset assessment regimes in unmodified helicopters, with no impacts on instrumentation noted.

## Mitigation

### Design-based Mitigations

15.3.49 In accordance with EN-1 defined applicant responsibilities, National Grid's approach ensures the inclusion of appropriate mitigation measures as an integral part of the proposed development. During the evolution of the Project's design, the identification of potential aviation impacts resulting from the Project has prompted the evaluation and incorporation of design changes to minimise adverse effects, where possible. This has included:

- Realignment of the overhead line: Adjusting the proposed route to increase distances from aerodromes or to take advantage of obstacle shielding (for example from high ground or existing obstacles);
- Reducing pylon height: Improving over-flight clearance margins;

15.3.50 The integration of marker balls (aircraft warning spheres) within the overhead line to enhance pilot visibility has also been considered but not yet agreed in one instance.

### Operational Mitigations

15.3.51 Beyond the Project design, impact assessment and operator consultation has considered a range of operational mitigations to reduce residual impacts. These include:

- Operator briefings and publication of information: Enhancing pilot situational awareness of the Project in relation to an aerodrome. Options include Aeronautical Information Service publications and operator websites
- Procedural changes: To avoid direct overflight of the overhead line or increase clearance margins. Examples include implementation of curved departures after take-off or landing approaches, or the use of alternative circuit patterns
- Runway changes: To orientation or length to avoid overhead line overflight or improve clearance margins

- Aerodrome closure.

15.3.52 National Grid recognises operator responsibilities for aerodrome safeguarding and has accordingly sought the agreement of operational mitigations within Statements of Common Ground (SoCG), recommending measures or enhancements for operator consideration of whether changes are reasonable and acceptable.

15.3.53 National Grid has committed to mitigations to address safeguarding concerns regarding military LFAs, including the sharing of Project infrastructure information to enable accurate charting. It is understood that typical mitigations for defence radar assets may entail software systems upgrades, which National Grid will seek to support, should impacts be confirmed by the MoD.

## 15.4 Aviation Assessment

### Overall Aviation Assessment Conclusions

15.4.1 This section provides a summary of aviation assessment conclusions, as well as the outcomes of consultation with stakeholders, including aerodrome owners and operators, recognising where SoCG have been agreed. In addition to Table A15.2.4, further detail is provided in relation to more complex assessments, within the subsequent narrative of Section Specific Aerodrome Assessment Conclusions and its supporting tables.

Table A15.2.4 Summary of Aerodrome Consultation and Assessment Conclusions

| Aerodrome | | Key Considerations | Consultation Summary | Assessment Summary |
|---|---|---|---|---|
| 1 | Barnards Farm (West Horndon) | Existing overhead lines in vicinity of aerodrome. | Initial concerns raised regarding height and proximity of overhead line to aerodrome; operator subsequently confirmed content with proposed alignment; SoCG agreed. | One of the two existing overhead lines in the vicinity will be undergrounded as a consequence of the Project. Distance from the runway end to the Project overhead line is sufficient to enable safe clearance margins during take-off and approaches, meeting the CAA's CAP168 measures. |
| 2 | Boxted | Non-operational | N/A, non-operational site. | N/A, non-operational site, therefore no impact from the Project. |
| 3 | Brock Farm (Napps Field) | Non-operational | Owner confirmed closed. | N/A, non-operational site, therefore no impact from the Project. |
| 4 | Brook Farm | Proposed overhead line in close proximity | SoCG agreed. | Para. 15.4.2refers. |

| Aerodrome | | Key Considerations | Consultation Summary | Assessment Summary |
|---|---|---|---|---|
| 5 | Broomfield Hospital | Used by emergency services (air ambulance). | Operator 'worst case' calculations, including of engine failure scenarios concluded aircraft could achieve significantly greater OHL clearance than legal minimum; no operational impact. | Concur with operator assessment; no operational impact. |
| 6 | Chase Farm | Proposed overhead line in close proximity | Engagement ongoing to agree reasonable mitigation. | Para. 15.4.4 refers. |
| 7 | Crowfield | N/A, none of note. | N/A, deemed to be un-impacted by the Project. | Aircraft sufficiently distant to avoid the overhead line via curved approaches or departures, or to overfly with substantial safety clearance margin |
| 8 | Dysons Farm | Helipad used by commercial and private rotary wing aircraft | Concerns raised re risk of collision in event of forced landing | Minimum helicopter vertical and horizontal clearances achievable on take-off involving transitioning from static hover to a climb and landing with an approach angle of up to 15°; no significant increase in risk of overhead line collision in event of forced or emergency landing and therefore safe. |
| 9 | Elmsett | Existing overhead line on broadly similar alignment to the Project | Concerns raised during meeting re potential impacts on future IFPs | Aircraft sufficiently distant to avoid the overhead line via curved approaches or departures, or to overfly with safe clearance margin. |
| 10 | Garnons Farm | N/A, none of note. | No concerns raised during telecon | Aerodrome sufficiently distant for aircraft to avoid overhead line overflight; no operational impacts. |
| 11 | Hinderclay Meadows | Runway parallel to overhead line | N/A, deemed to be un-impacted by the Project. | Significantly distanced; aircraft departing or approaching aerodrome have no requirement to overfly overhead line; no operational impacts. |

| Aerodrome | | Key Considerations | Consultation Summary | Assessment Summary |
|---|---|---|---|---|
| 12 | Laindon (Bensons Farm) | Existing overhead line to south of runway | N/A, deemed to be un-impacted by the Project. | Aircraft sufficiently distant to avoid the overhead line via curved approaches or departures, or to overfly with substantial safety clearance margin. |
| 13 | Long Stratton | Predominantly used by rotary wing aircraft | No concerns raising during telecon; no impact to rotary or fixed wing aircraft anticipated | Distance from the overhead line sufficient for helicopter operations in all directions; sufficient distance for fixed wing aircraft to avoid overhead line via curved take-off or approaches or safely overfly with sufficient clearance margin. |
| 14 | Nayland | Existing overhead line overflown 150m from runway end | No concerns raised during meeting | Wide clearance margins for safe straight-ahead departures and approaches overflying the overhead line; curved approaches and departures avoid and overfly the underground cable route. |
| 15 | Priory Farm | Deconfliction with Tibenham aerodrome | Engagement ongoing to agree respective positions on impacts and reasonable mitigations. | Para. 15.4.9 refers. |
| 16 | Raydon Wings | Location of proposed cable sealing end compound; underground cable construction | Engagement ongoing to agree respective positions impacts and reasonable mitigations. | Para 15.4.12 refers. |
| 17 | Tacolneston (South Norfolk Model Aircraft Club) | Model aircraft | No operator feedback received to date | Design change implemented to re-align the Project overhead line and increase separation distances from the Club site, exceeding the 150m minimum distance recommended by CAP2320. Potential adverse impacts are minimised, and the Club can continue to safely operate from the site. |

| Aerodrome | | Key Considerations | Consultation Summary | Assessment Summary |
|---|---|---|---|---|
| 18 | Thurrock | Proposed overhead line in close proximity; cumulative impacts with existing overhead line. | SoCG agreed. | Para. 15.4.19 refers. |
| 19 | Tibenham (Norfolk Gliding Club) | Gliding operations (including competitions), deconfliction with Priory Farm aerodrome. | Engagement ongoing to agree respective positions impacts and reasonable mitigations. | Para. 15.4.22 refers. |
| 20 | Wattisham Flying Station | Military aerodrome | Following assessment, the operator and DIO confirmed no outstanding safeguarding concerns, including for obstacle treatment and bird strike safeguarding zones; SoCGs with WFS and DIO seek re-confirmation for proposed DCO alignment (minor changes – see also Table A15.2.1). | Corroboration of MOD assessment; no operational impacts |
| 21 | Wormingford (Essex & Suffolk Gliding Club) | Predominantly winch-launched gliding operations | No concerns raised during meeting | Majority of gliding operations on R08/256 runway due to prevailing wind direction – this does not require overflight of overhead line. Runway R14/32 sufficiently distanced from overhead line to enable safe overflight for winch and tug-launched gliders. |

# Specific Aerodrome Assessment Conclusions

## Brook Farm

15.4.2 Brook Farm aerodrome is unlicensed with no defined OLS. In response to stakeholder feedback received during the 2023 non-statutory consultation raising concerns that the overhead line would present a significant obstacle which could not be readily overflown, and an initial impact assessment that concurred continued operations at the site would be challenging, a balanced assessment of receptor impacts was carried out that resulted in design changes being implemented. These comprised an eastern deviation to the Project's proposed alignment, represented by the 2024 Preferred Draft Alignment. The owner and operator provided feedback to the 2024 Statutory Consultation expressing continued concerns that then proposed overhead line as an obstacle was too high and too close to the aerodrome. In response, and whilst assessment showed significant improvement in overflight clearance, further design changes were implemented to realign the Project further east and change its orientation, resulting in increased divergence from the aerodrome's take-off and approach paths.

15.4.3 The proposed alignment of the Project in the vicinity of Brook Farm is assessed to reduce adverse aviation impact, allowing continued safe use of the aerodrome's southern landing circuit, as well as safe clearances of the overhead line during take-off and approaches. CAP168 OLS measures are met, with the exception of a minor infringement of the Inner Horizontal Surface (IHS) (see Table A15.2.5). Test flying undertaken by the operator concluded, based on the performance of the resident aircraft, that aerodrome operations would continue to be workable with the Project, subject to procedural mitigations, to be considered on a flight by flight basis in accordance with flying conditions. The operator agreed with National Grid's assessment approach and conclusions within a SoCG.

Table A15.2.5 Brook Farm Aerodrome Impact Assessment Summary

| **Runways** | | | | | |
|---|---|---|---|---|---|
| Runway | TORA m[5] | DER Elevation (amsl) m | OHL in Splay | Dist DER to OHL m[6] | CAP 168 Code[7] |
| 05 | 390 | 43 | RG94-95A | 1509 | 1A |
| **OHL** | | | | | |
| Drawing ref | 01_220101_98_RevA | | | | |
| | Ref Tower | Height (agl) m | Elevation (amsl) m | Overall height (amsl) m | Relative height m (ft) |
| | RG94 | 52 | 46 | 98 | 55 (181 ) |

[5] Acronyms used within Aerodrome Impact Assessment Summary tables: TORA = Take-off run available, DER = Departure end of runway, TOP = Take-off point, TDP = Touchdown point

[6] Distance to the nearest part of the OHL that falls within the splay

[7] Equivalent licensed runway code according to OLS type

| Take-off Assessment | | | |
|---|---|---|---|
| Runway | Slope from TOP to OHL | CAP 168 Compliance?[8] | |
| 05 | 3.4% | Yes* | |
| **Runway 05** | | | |
| | Low Performance | High Performance | Microlight Performance |
| Clearance over OHL m (ft) | 67 (219) | 93 (305) | 98 (321) |

| Landing Assessment | | |
|---|---|---|
| Runway | Slope from OHL to TDP | CAP 168 Compliance? |
| 23 | 3.6% | Yes* |
| **Runway 23** | | |
| Clearance overOHL 4° approach m (ft) | 53 (173) | |
| Clearance over OHL 5° approach m (ft) | 80 (262) | |

## Chase Farm

15.4.4 Chase Farm aerodrome is unlicensed without a defined OLS. It has a single runway. The 2023 Preferred Draft Alignment placed the Project 550 m from the western end of the runway. Detailed assessment concluded that there was insufficient distance for aircraft to take-off and turn away from the proposed overhead line safely. Approaches were also assessed to be difficult, with the approach angle required for safe overflight being considerable and assessed to be unworkable for many aircraft types, including microlights such as those based at the aerodrome.

15.4.5 The 2024 Preferred Draft Alignment re-positioned the Project to diverge it to the south-west of the aerodrome, increasing the distance from the runway end. The impact assessment concluded that, although the re-alignment represented a small improvement, operations remained unviable as a result of the Project's preferred alignment. During Statutory Consultation, the operator confirmed the Project's alignment was not acceptable to them, and that the proposed development would likely result in the closure of the aerodrome.

15.4.6 Further re-location of the proposed Project is not being taken forward as a preferred option due to competing constraints in the area. National Grid designed and presented to the operator an alternative option for the runway to be re-orientated, maintaining or potentially extending its length but significantly increasing the distance to the Project. The proposal was rejected by the operator on the basis of lack of compliance with the aforementioned CAP 793 obstacle height and distance recommendation, and the gradient of the land (estimated to be -1.6% from NE to SW) considered to be excessive. National Grid's consultants do not assess the gradient to be excessive for safe operation, being within gradient parameters required under CAP 168 for a licensed Code 1a runway.

[8] Consideration of whether the obstacle is under the take-off and approach OLS (measured from DER) for a licensed runway of equivalent characteristics

* CAP 168 IHS breached by approx. 10m

15.4.7 Reorientation or relocation of the runway could allow the current type and level of operations at the aerodrome to continue, subject to the agreement of the operator that it provides a reasonable mitigation to aviation impacts.

15.4.8 Engagement with Chase Farm is ongoing to assess possible solutions or agree closure.

Table A15.2.6 Chase Farm Aerodrome Impact Assessment Summary - Existing Runway

| **Runways** | | | | | |
|---|---|---|---|---|---|
| Runway | TORA m | DER Elevation (amsl) m | OHL in Splay m | Dist DER to OHL m | CAP 168 Code |
| 25 | 300 | 54 | TB219-221 | 492 | 1A |
| **OHL** | | | | | |
| Drawing ref | 01_220101_94 Issue A | | | | |
| | Ref Tower | Height (agl) m | Elevation (amsl) m | Overall height (amsl) m | Relative height m (ft) |
| | TB220 | 48 | 58 | 106 | 52 (171) |

| **Take-off Assessment** | | |
|---|---|---|
| Runway | Slope from TOP[1] to OHL | CAP 168 Compliance? |
| 25 | 9.2% | No |

| **Runway 25** | | | |
|---|---|---|---|
| | Low Performance | High Performance | Microlight Performance |
| Clearance over OHL m (ft) | -9 (29) | 0 | 2 (6) |

| **Landing Assessment** | | |
|---|---|---|
| Runway | Slope from OHL to TDP[1] | CAP 168 Compliance? |
| 07 | 10.0% | No |
| **Runway 07** | | |
| Clearance over OHL 4° approach m (ft) | -15 (49) | |
| Clearance over OHL 5° approach m (ft) | -7 (23) | |

Table A15.2.7 Chase Farm Aerodrome Impact Assessment Summary - Reorientated Runway and Overhead Line Realignment

| Runway | | | | | |
|---|---|---|---|---|---|
| Runway | TORA m | DER Elevation (amsl) m | OHL in Splay m | Dist DER to OHL m | CAP 168 Code |
| 21 | 300 | 44 | TB223-225 | 1211 | 1A |
| **OHL** | | | | | |
| Drawing ref | 01_220101_101 Issue A | | | | |
| | Ref Tower | Height (agl) m | Elevation (amsl) m | Overall height (amsl) m | Relative height m (ft) |
| | TB224 | 52 | 39 | 91 | 47 (154) |

| Take-off Assessment | | |
|---|---|---|
| Runway | Slope from TOP to OHL | CAP 168 Compliance? |
| 21 | 3.6% | Yes** |

| Runway 21 | | | |
|---|---|---|---|
| | Low Performance | High Performance | Microlight Performance |
| Clearance over OHL m (ft) | 52 (171) | 72 (236) | 77 (253) |

| Landing Assessment | | |
|---|---|---|
| Runway | Slope from OHL to TDP | CAP 168 Compliance? |
| 03 | 3.7% | Yes** |
| **Runway 03** | | |
| Clearance over OHL 4° approach m (ft) | 41 (135) | |
| Clearance over OHL 5° approach m (ft) | 62 (203) | |

### Priory Farm

15.4.9 Priory Farm is an unlicensed aerodrome without defined OLS. It has two runways and is located approximately 1.1 km to the east of Tibenham aerodrome, although the two facilities operate independently with non-conflicting take-off and approach paths and circuit patterns. Consultation with the aerodrome operator during the 2024 Statutory Consultation raised concerns of non-compliance with the CAP 793 obstacle height and distance recommendation, and concerns regarding the aerodrome's ability to operate its existing circuits. Project visibility and risks of engine failure were also discussed.

15.4.10 Our assessment conclusions for Priory Farm Airfield include that, whilst the Project will represent a new obstacle in the vicinity, CAP168 OLS standards are met, with the exception of a minor penetration of the IHS (see Table A15.2.8). Distances from the runway ends to the proposed Project are assessed as sufficient to enable safe clearance margins during take-off and landing. Whilst current circuits would involve overflight of the overhead line, this is assessed to be from a safe height, in

** The OHL is below the OLS for take-off, approach and transitional. IHS penetrated by up to 10m

accordance with normal practices. Furthermore, it is assessed that the position of the Project would have minimal impact on aircraft returning to the airfield in an emergency. Deconfliction of interactions in flight procedures between the aerodrome and Tibenham aerodrome has been considered within the assessment.

15.4.11 The operator's consideration of the acceptability of the Project design, and the agreement of potential reasonable mitigations (such as marker balls to address visibility concerns) is subject to ongoing discussion.

Table A15.2.8 Priory Farm Aerodrome Impact Assessment Summary

| **Runways** | | | | | |
|---|---|---|---|---|---|
| Runway | TORA m | DER Elevation (amsl) m | OHL in Splay m | Dist DER to OHL m | CAP 168 Code |
| 01 | 650 | 57 | RG49-64* | 1474-1524* | 1A |
| 19 | 650 | 57 | RG49-64* | 1823-2168* | 1A |
| **OHL** | | | | | |
| Drawing ref | 01_220101_92 Rev A | | | | |
| | Ref Tower | Height (agl) m | Elevation (amsl) m | Overall height (amsl) m | Relative height m (ft) |
| R01 Low circuit | RG52 | 54 | 48 | 102 | 45 (148) |
| R01 High circuit | RG52 | 54 | 48 | 102 | 45 (148) |
| R19 Low circuit | RG60 | 54 | 59 | 113 | 56 (183) |
| R19 High circuit | RG63 | 51 | 55 | 106 | 49 (161) |

| **Take-off Assessment** | | |
|---|---|---|
| Runway | Slope from TOP to OHL | CAP 168 Compliance? |
| 01 | 2.7% | Yes** |
| 19 | 2.8% | Yes** |

| **Runway 01** | | | |
|---|---|---|---|
| | Low Performance | High Performance | Microlight Performance |
| Clearance over OHL m (ft) | 79-83 (259-272) | 106-110 (348-361) | 111-116 (364-381) |
| **Runway 19** | | | |
| | Low Performance | High Performance | Microlight Performance |
| Clearance over OHL m (ft) | 95-128 (312-420) | 127-166 (417-545) | 134-174 (440-571) |

| | **Landing Assessment** | |
|---|---|---|
| Runway | Slope from OHL to TDP | CAP 168 Compliance? |
| 01 | 3.0% | Yes** |

* The OHL generally runs parallel to the runway – this range takes the published circuits into account

** The OHL is below the OLS for take-off, approach and transitional. IHS penetrated by up to 16m

| 19 | 2.9% | Yes** |
|---|---|---|
| | **Runway 01** | **Runway 19** |
| Clearance over OHL 4° approach m (ft) | 76 (249) | 63 (207) |
| Clearance over OHL 5° approach m (ft) | 108 (354) | 89 (252) |

### Raydon Wings

15.4.12 Raydon Wings is an unlicensed aerodrome with a single runway. The operator submitted a safeguarding plan to the LPA in 2024. Its defined obstacle clearance limits include an Outer Safeguarded Zone (OSZ) of 4 km from the Aerodrome Reference Point, with a minimum vertical limit of 45 m.

15.4.13 Operator feedback to the Project 2022 non-statutory consultation raised concerns regarding potential impacts on the aerodrome. In response to feedback and other constraints, the 2024 Preferred Draft Alignment reflected significant changes in the vicinity of the aerodrome, including the location of a Cable Sealing End (CSE) compound to the north of the aerodrome (screened from it by an area of woodland), with underground cable replacing the overhead line in its immediate vicinity. Consultation during the 2024 statutory consultation period discussed the aerodrome's safeguarding plan, and the operator's continued concerns, relating to the height and proximity of the remaining overhead line, including the CSE compound, and potential turbulence from Project infrastructure. The proposed underground cable route and potential impacts, during construction as well as interference with avionics, was also discussed.

15.4.14 Targeted consultation in spring 2025 sought feedback on proposed changes to the underground cable route, including the point of interface with the aerodrome runway. Ongoing engagement with the operator has focused on continued concerns regarding the position of the CSE compound and its associated impacts, the underground cable route and temporary impacts of construction on aerodrome operations, impact assessment methodology and the adequacy of National Grid's consultation with aerodromes.

15.4.15 National Grid's impact assessment conclusions for Raydon Wings aerodrome include that, whilst the proposed Project will represent a new obstacle in the vicinity, CAP168 OLS standards are met, with the exception of a minor penetration of the Inner Horizontal Surface (IHS) (see Table A15.2.9). It is assessed that existing circuits can continue to be used safely, including to the north, overflying the overhead line at a safe height from which there would be a range of alternative landing sites in the event of an emergency.

15.4.16 The locations of pylons and other structures associated with the Project are assessed to be sufficiently distanced from take-off and approach paths for aircraft not to be impacted by any wind turbulence effects. It has also been considered whether EMF produced from the overhead line might adversely impact aircraft avionics or other aircraft systems, compromising operational safety. It is assessed that minimum clearances allowed for aircraft overflying or otherwise within the vicinity of the overhead line will enable aircraft to be sufficiently distanced to avoid unacceptable adverse effects.

15.4.17 National Grid anticipates magnetic fields of between 77-111 microteslas at 1 m above ground may be produced by underground cables proposed at the Raydon Wings airfield runway. In the absence of standards specifying maximum

electromagnetic field strengths for aviation, National Grid has previously performed testing involving aircraft taxiing over operational cables at a comparable aerodrome and determined that Alternating Current (AC) interference did not impact aircraft avionics in that instance. Magnetic compasses are unaffected by AC fields. AC operates at 50 hertz while aviation electrical supply, when not direct current (DC) typically operates in the megahertz range, so no interference is likely by that mechanism. Also, electromagnetic field interference on radio altimeters, which operate in the gigahertz range, is not expected from power transmission sources. Furthermore, it is recognised that the aircraft types known to utilise Raydon Wings are unlikely to be fitted with radio altimeters, or reliant on Instrument Flight Procedures (IFPs) that require runway protection or allow Autoland capability. It should be noted that electromagnetic fields produced by the Project cables are unlikely to be distinguishable from those generated by the aircraft's own electrical systems and therefore not disruptive to instrumentation.

15.4.18 The operator has not confirmed that the proposed Project is acceptable and continues to propose changes to the location of the CSE compound. National Grid has offered further engagement with the operator to explore potential design mitigations to minimise temporary disruption associated with works to install the proposed underground cables.

Table A15.2.9 Raydon Wings Aerodrome Impact Assessment

| **Runway** | | | | | |
|---|---|---|---|---|---|
| Runway | TORA m | DER Elevation (amsl) m | OHL in Splay | Dist DER to OHL m | CAP 168 Code |
| 09 | 820 | 52 | None | N/A | 2B |
| **OHL** | | | | | |
| Drawing ref | 01_220101_96_Raydon_Wings_Airstrip – Rev A | | | | |
| | Ref Tower | Height (agl) m | Elevation (amsl) m | Overall height (amsl) m | Relative height m (ft) |
| | JC35 | 15 | 47 | 62 | 10 (33) |
| | JC33 | 49 | 48 | 97 | 45 (148) |

| **Take-off Assessment** | | | |
|---|---|---|---|
| Runway | Slope from TOP[1] to OHL | CAP 168 Compliance?[4] | |
| 09 | N/A | Partial* | |
| **Runway 09** | | | |
| | Low Performance | High Performance | Microlight Performance |
| Clearance over OHL m (ft) | N/A | N/A | N/A |

* The OHL position does not infringe climb or approach areas, or the Transitional Surface. The IHS is infringed by approx. 2-3m.

| Landing Assessment | | |
|---|---|---|
| Runway | Slope from OHL to TDP[1] | CAP 168 Compliance?[4] |
| 27 | N/A | Partial* |
| **Runway 27** | | |
| Clearance over OHL 4° approach m (ft) | N/A | |
| Clearance over OHL 5° approach m (ft) | N/A | |

### Thurrock

15.4.19 Thurrock is an unlicensed aerodrome with no defined OLS. It has two adjacent runways. Take-offs and approaches overfly an existing 132 kV overhead line located approximately 750m from the end of runway R25.

15.4.20 Detailed assessment of the 2023 Preferred Draft Alignment concluded that aircraft approaches to the aerodrome would only clear the proposed overhead line by a small margin, and as such would be unacceptable. To improve clearances, design changes implemented within the 2024 Preferred Draft Alignment included the incorporation of an additional pylon to reduce heights and improve clearances. Operator concerns raised during the 2024 Statutory Consultation related to marginal take-off and approach clearances, and increased emergency landing risks due to reduced land availability between the existing and the proposed Project.

15.4.21 In response to feedback, further design changes have been incorporated and are assessed to reduce adverse aviation impacts. These include altering the design to lower height pylons, and re-locating and re-orientating the Project's proposed alignment to parallel the existing 132 kV PAB overhead line. It is assessed that, while CAP 168 OLS measures are not met, in view of the existence of the 132kV asset, the proposed Project alignment will benefit from shielding as a result of the predominant obstacle, and will not be detrimental to the safe operability of Thurrock airfield. The operator has confirmed concurrence with the assessment within a SoCG, signed July 2025.

Table A15.2.10 Thurrock Aerodrome Impact Assessment Summary - Proposed Project OHL and Existing PAB OHL

| Runways | | | | | |
|---|---|---|---|---|---|
| Runway | TORA m | DER Elevation (amsl) m | OHL in Splay m | Dist DER to OHL m | CAP 168 Code |
| 07 | 700 | 9 | TB240-242 | 893 | 1A |
| | | | *PAB38-40* | *748* | |
| **OHL** | | | | | |
| Drawing ref | 01_220101_130_RevA | | | | |
| | Ref Tower | Height (agl) m | Elevation (amsl) m | Overall height (amsl) m | Relative height m (ft) |
| PROPOSED | TB241 | 34 | 21 | 55 | 46 (151) |
| EXISTING | *PAB39* | *32* | *20* | *52* | *43 (141)* |

| Take-off Assessment | | | |
|---|---|---|---|
| Runway | Slope from TOP[1] to OHL | CAP 168 Compliance?[4] | |
| 07 | 4.3% | No* | |
| *(Existing PAB Line) 07* | *4.7%* | *No** | |
| **Runway 07** | | | |
| | Low Performance | High Performance | Microlight Performance |
| Clearance over OHL m (ft) | 35 (115) | 52 (171) | 56 (184) |

| Landing Assessment | | |
|---|---|---|
| Runway | Slope from OHL to TDP[1] | CAP 168 Compliance?[4] |
| 25 | 4.8% | No* |
| *(Existing PAB Line) 25* | *5.3%* | *No** |
| **Runway 25** | | |
| Clearance over OHL 4° approach m (ft) | 21 (68) | *14 (46) - PAB Line* |
| Clearance over OHL 5° approach m (ft) | 37 (121) | *28 (92) - PAB Line* |

### Tibenham

15.4.22 Tibenham aerodrome is unlicensed without defined OLS. It has three runways and is used by Norfolk Gliding Club (NGC) and by powered light aircraft. Gliders are launched by winch and aerotow. Tibenham hosts gliding competitions and is recognised as a national Significant Area for Sport (SASP) by Sports England.

15.4.23 Consultation with the operator revealed concerns regarding the proximity of the 2023 Preferred Draft Alignment to the aerodrome, potentially impacting take-offs and approaches from the east/west R08/26 runway. Insufficient space for emergency landings was also raised. In response to the 2024 Preferred Draft Alignment and during the Statutory Consultation period, the operator reiterated concerns regarding Project impacts on the aerodrome's gliding operations, including aerotow launches and competition requirements. The operator's proposed safeguarding of a 5 km radius from the centre of the aerodrome was also discussed. In addition, in response to targeted consultations in spring 2025, the BGA raised concerns regarding Project impacts on NGC's ability to operate safely and hold gliding competitions.

15.4.24 National Grid's impact assessment conclusions include that, whilst the Project will represent a new obstacle in the vicinity, CAP168 OLS standards are met, with the exception of a minor penetration of the Inner Horizontal Surface (IHS). Overhead line overflight clearance margins for straight ahead take-offs (including for aerotows) and glider or powered aircraft approaches are assessed as adequate. In the event of engine failure of a towing aircraft, it is assessed that there is sufficient distance between the runway and the overhead line for the pilot to manoeuvre and land safely. Furthermore, it is assessed that current circuits can continue to be used.

* The proposed OHL is shielded by the existing (closer) 132kV PAB OHL, which is also not CAP 168 compliant

15.4.25 Feedback from the operator and the BGA has been considered, as well as account taken of current BGA guidance, including in relation to competition requirements. The operator has not agreed to the acceptability of the proposed Project. It is anticipated that further engagement with the operator and the BGA will clarify implications for competition finishes in particular.

Table A15.2.11 Tibenham Aerodrome Impact Assessment Summary

| **Runways** | | | | | |
|---|---|---|---|---|---|
| Runway | TORA m | DER Elevation (amsl) m | OHL in Splay | Dist DER to OHL m | CAP 168 Code |
| 26 | 1065 | 55 | RG56-59 | 1943 | 2C |
| 33 | 1250 | 53 | RG48-50 | 1909 | 3C |
| **OHL** | | | | | |
| Drawing ref | 01_220101_97 Rev A, 01_220101_91 Rev A | | | | |
| | Ref Tower | Height (agl) m | Elevation (amsl) m | Overall height (amsl) m | Relative height m (ft) |
| 26 | RG57 | 54 | 60 | 114 | 61 (200) |
| 33 | RG50 | 52 | 40 | 92 | 39 (128) |

| **Take-off Assessment** | | |
|---|---|---|
| Runway | Slope from TOP to OHL | CAP 168 Compliance? |
| 26 | 2.7% | Yes* |
| 33 | 1.8% | Yes* |

| **Runway 26** | | | | |
|---|---|---|---|---|
| | Low Performance | High Performance | Microlight Performance | Aerotow Performance** |
| Clearance overOHL m (ft) | 109 (358) | 145 (476) | 152 (499) | 72 (236) |
| **Runway 33** | | | | |
| | Low Performance | High Performance | Microlight Performance | Aerotow Performance** |
| Clearance over OHL m (ft) | 130 (430) | 166 (545) | 173 (568) | 93 (305) |

| | **Landing Assessment** | |
|---|---|---|
| Runway | Slope from OHL to TDP[1] | CAP 168 Compliance?[4] |
| 08 | 2.9% | Yes* |
| 15 | 1.9% | Yes* |
| | **Runway 08** | **Runway 15** |
| Clearance over OHL 4° approach m (ft) | 84 (276) | 103 (338) |
| Clearance over OHL 5° approach m (ft) | 119 (390) | 138 (453) |

* The OHL does not penetrate the OLS for take-off/approach. IHS penetrated by approx. 16m

** Based on the height weight, fastest tow speed quoted in the Eurofox Pilot's Operating Handbook (POH)

# Abbreviations

| Abbreviation | Full Reference |
|---|---|
| AAIB | Air Accident Investigation Board |
| AC | Alternating Current |
| AIP | Aeronautical Information Publication |
| ANO | Air Navigation Order |
| BGA | British Gliding Association |
| CAA | Civil Aviation Authority |
| CAA AAT | Civil Aviation Authority Airfields Advisory Team |
| CNS | Communications, Navigation and Surveillance |
| CSE | Cable Sealing End |
| DC | Direct Current |
| DCO | Development Consent Order |
| DER | Departure End of Runway |
| DIO | Defence Infrastructure Organisation |
| DTM | Digital Terrain Model |
| EMF | Electric and Magnetic Fields |
| EU | European Union |
| GA | General Aviation |
| GAAC | General Aviation Awareness Council |
| GIS | Geographic Information System |
| HHLS | Hospital Helicopter Landing Sites |
| ICAO | International Civil Aviation Organisation |
| IFP | Instrument Flight Procedures |
| IHS | Inner Horizontal Surface |
| ISA | International Standard Atmosphere |
| KIAS | Knots Indicated Airspeed |
| LFA | Low Flying Area |
| LiDAR | Light Detection and Ranging |
| LoD | Limits of Deviation |

| Abbreviation | Full Reference |
|---|---|
| LPA | Local Planning Authority |
| MOD | Ministry of Defence |
| NATS | National Air Traffic Services |
| NGC | Norfolk Gliding Club |
| NPPF | National Planning Policy Framework |
| NPS | National Policy Statement |
| OHL | Overhead Line |
| OLS | Obstacle Limitation Surfaces |
| OSZ | Outer Safeguarded Zone |
| PPG | Planning Practice Guidance |
| POH | Pilot's Operating Handbook |
| RAF | Royal Air Force |
| RoC | Rate of Climb |
| SASP | Significant Area for Sport |
| SoCG | Statement of Common Ground |
| SoS | Secretary of State |
| TDP | Touchdown Point |
| TOP | Take-off Point |
| TORA | Take-off Runway Available |
| VFR | Visual Flight Rules |
| WFS | Wattisham Flying Station |

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