Highlands and Islands Airports Limited
Puirt-adhair na Gàidhealtachd is nan Eilean Earranta

Aviation Safeguarding and Windfarm Developments Safeguarding Roadmap

About us

Highlands and Islands Airport Limited (HIAL) is a private limited company wholly owned by Scottish Ministers and is responsible for the management and operation of 11 airports located at Barra, Benbecula, Campbeltown, Dundee, Inverness, Islay, Kirkwall, Stornoway, Sumburgh, Tiree and Wick John O'Groats.

We receive subsidies from the Scottish Government in accordance with section 34 of the Civil Aviation Act 1982 and are sponsored by Transport Scotland – Aviation, Maritime, Freight and Canals Directorate.
Working with our stakeholders, we are committed to supporting the essential socio-economic role of aviation in Scotland by maintaining and developing our airports and the connections they provide for some of Scotland's more remote communities.
Safety underpins every aspect of our operations. We have a robust safety and security programme that achieves regulatory compliance throughout our organisation. We continuously review our systems and procedures to ensure that our organisation and every one of our airports has the very highest standards of safety performance and resilience.

Our Mission, Vision and Values

HIAL's mission is to create social benefit and economic prosperity by building Scotland's sustainable regional airport group of the future.

This is reinforced by our vision to become a 'net-zero carbon regional airport group'.

Our values underpin everything we do and how we do it. They define who we are; our expectations of each other and ourselves; how we interact with each other and how we interact with our customers, communities and other stakeholders.

Safety is our Priority

HIAL's priority is the safety of aircraft within our certified operational airspace. Air Traffic Control (ATC) use an extensive network of systems that provide surveillance coverage, navigation aids and voice and data communication to maintain safety at our 11 airports.

Aviation Safeguarding

Physical Safeguarding, Technical Safeguarding, Wildlife and Landscape Management
Aviation Safeguarding is a process that ensures any development or activity taking place within the vicinity of our airports does not adversely affect the safe operation of aircraft, including landing and departing. Following this assessment process, we can make sure that the appropriate measures are taken for the continued safe and efficient movement of aircraft. The Safeguarding assessment process applies to any notified development.

Windfarm Developments

There has been a continued deployment of windfarm developments across Scotland as a source of zero carbon electricity. Windfarm developments can have a particularly significant impact on aviation safety and operations. HIAL identified the need to establish a clear and transparent assessment process for all safeguarding applications, including windfarm developments. Windfarm developments fall under the standard safeguarding system required by the International Civil Aviation Organisation (ICAO) and United Kingdom Civil Aviation Authority (UK CAA).

Working with Developers

HIAL works with developers to assess any potential impact on aviation safety and operations and to develop suitable mitigation strategies should they be needed.

This defined Safeguarding Roadmap will allow a clear understanding of what is required by HIAL and the responsibilities that will be passed to the Developer, as well as the agreed approach to process any development submission (known as the Safeguarding Case).

Safeguarding Case

Every Safeguarding Case will be unique; some may be relatively simple and require a straightforward safeguarding assessment; others may be complex and involve detailed assessments across all aspects of safeguarding, potentially requiring subsequent mitigation projects.

As well as assessing and identifying any impacts to safety and operations, HIAL may have to assess and quantify the suitability of a Windfarm Mitigation Service that it is able to offer to mitigate the development in question.

Working with Developers

Safeguarding Roadmap

Each Safeguarding Case will follow a defined process – the Safeguarding Roadmap. The Roadmap is designed to be holistic and applicable to any proposed development. It can be used for the simplest or the most complex development proposal and is proportional to the complexity and level of effort required by all parties to ensure safety and operations at HIAL airports can be maintained.

The Safeguarding Roadmap is broken down into five stages. This allows for a structured approach to identifying all the potential issues that a development may cause, whilst ensuring that any necessary commitments from both HIAL and the developer are put in place at the right time. This approach also allows for planning consent to be approved in principle by the planning authority, where appropriate, with limited financial commitment from the developer.

Initiation

If a Developer requests HIAL pre-planning advice and engagement in considering a development, there will be an associated fixed fee for this service (£500 excluding VAT). HIAL can provide an informal meeting (one meeting) if requested with a developer, and at this time a nominated Case Manager will be appointed. HIAL will review the development parameters and advise if an Aviation Impact Feasibility Study (AIFS) is required, or that the development will cause no impact.

Stage One – Initial Assessment

The Developer commissions an Aviation Impact Feasibility Study (AIFS) at the Developer's cost. A standard Initial Assessment commercial agreement for a fixed fee (£750 excluding VAT) will be entered into between the Developer and HIAL, for HIAL to conduct an initial assessment of the provided AIFS. The HIAL Case Manager will review and assess the AIFS and, where necessary, call upon internal and external subject matter experts.

If no impacts are identified following the review and assessment, HIAL may decide it is not necessary to object to the development.

Where, in HIAL's opinion, critical impacts are identified for which there are no viable mitigation controls available, then HIAL may lodge an objection to the planning authority.

Where impacts are identified, HIAL will advise if any potential mitigation solutions are available.

Where an impact is identified that affects an airport's Primary Surveillance System (PSR), further assessment will be required to determine the viability of an available mitigation solution.

HIAL will share the Commercial Principles and the Schedule of Charges applicable to the provision of a Mitigation Service.

Note: The following Stages of this Roadmap only apply to developments that impact a PSR. This currently only applies to Inverness Airport (see page 7); however, it will be applicable should any other HIAL airport introduce a PSR. The expectation is that wind turbine developments will be most likely to impact an airports PSR. However, should any development impact the PSR, the following Stages will be followed.

Stage Two – Radar Modelling Assessment

HIAL has introduced a Radar Mitigation Service (the Mitigation Service) to mitigate the impact of developments.

The Mitigation Service may not be suitable for every development. To establish whether the Mitigation Service is a viable option, the HIAL Case Manager will instruct Radar Modelling Assessments.

A standard Radar Modelling Assessment commercial agreement will be put into place between the Developer and HIAL, for a fixed fee (as set out in the schedule of charges) to allow HIAL to commission a Baseline Flight Trial and Desktop Assessment.

Working with Developers

Baseline Flight Trial

The Mitigation Service is based on a modern radar surveillance system. When a surveillance system is commissioned, it is impossible to measure accurate performance levels across its whole coverage as conducting flight trials on every radial (360°) to the full range extent is not practicable. As such, when the Mitigation Service is proposed for a development case, measurement of the baseline performance of the radar over the windfarm development region before turbines are built is required. This allows for quantitative evidence to be used in comparing performance of the solution before and after the turbines have been commissioned. This is crucial in providing robust evidence towards the safety arguments that must be generated for the mandatory regulatory assurance under Civil Aviation Authority (CAA) Regulations.

The fixed fee for conducting the Baseline Flight Trial includes:

- Design of the Flight Trial;
- Gaining necessary approvals to conduct the Flight Trial;
- Hire of a suitably equipped specified aircraft to meet the requirements of the Flight Trial;
- Conduct and Management of the Flight Trial;
- Data Recording and Analysis Report which provides the quantitative evidence of performance, and
- Stakeholder Management.

Desktop Assessment

The Desktop Assessment will analyse the potential impact of the development on the airport's Primary Surveillance Radar. This will consider the ability of the Mitigation Service to provide suitable coverage over the proposed windfarm volume, including estimates of the Probability of Detection (PD) that will be achieved.

Radar Mitigation Scheme

If, following the Radar Modelling Assessment, HIAL concludes the Mitigation Service is a viable option for the development case in question, the developer will be offered the Mitigation Service as a Radar Mitigation Scheme. HIAL will consult with the planning authority to remove the objection and attach a condition to any grant of planning permission. Acceptance of the Mitigation Service will involve HIAL and the Developer signing the standard Mitigation Service commercial agreement which sets out the terms for implementation and ongoing provision of the Mitigation Service. At this stage, HIAL expects that construction of the development can commence but turbines cannot operate, other than for testing and evaluation as agreed with HIAL.

If, following the Radar Modelling Assessment, HIAL concludes the Mitigation Service is not a viable option for the development case in question, HIAL's Case Manager will provide an explanation of the conclusion and any further steps that may be available to the developer.

Stage Three – Mitigation Service Implementation

This stage is where the Mitigation Service is implemented, commissioned, validated and accepted into operation.

HIAL will ascertain the level of effort, scope and charges for the implementation that will be applicable, depending on the size and complexity of the development.

All these activities must be undertaken in a structured and controlled manner that supports the parallel regulatory safety assurance measures that HIAL is mandated to undertake to ensure that aviation safety is maintained.

Once all Mitigation Service measures have been fully implemented, HIAL will be able to confirm if the Radar Mitigation Scheme satisfies planning conditions and turbines can become fully operational.

Working with Developers

Technical Implementation, Commissioning and Validation

The changes required to configure the Mitigation Service require that the existing and assured Air Traffic Management and Communication Navigation Surveillance system is altered. Any changes to an assured system must be completed in a safe, structured and controlled manner, and in accordance with the HIAL Safety Management System, and as required by the CAA regulatory requirements. This breaks down into three related sets of activities:

(1) Technical Implementation:

- Update of the System Configuration.
- Optimisation of the system to provide required coverage over the windfarm volume.
- Update of the Radar Data Processing solution to add additional mosaic infill for the new windfarm volume.

(2) Commissioning Flight Trial

The commissioning Flight Trial occurs after the turbines have been built and after the Mitigation Service has been implemented. The results allow for performance to be compared before and after the turbines have been installed, and provide crucial evidence that the service mitigates the issues satisfactorily, and to the required safety objectives:

- Design of the Flight Trial.
- Gaining necessary approvals to conduct the Flight Trial.
- Hire of a suitably equipped specified aircraft to meet the requirements of the Flight Trial.
- Conduct and Management of the Flight Trial.
- Data Analysis Report which provides quantitative evidence of performance.

(3) Validation:

- Flight Trial Summary Report which summarises the quantitative performance evidence (Data Analysis Report) against the operational requirements; and
- Stakeholder management.

Safety Assurance

In accordance with National and International Regulations, HIAL is mandated to manage the aviation safety risk for the air traffic service it provides. As such, any change to Air Traffic Management and Communication Navigation Surveillance systems which provide the air traffic services must be carefully managed, risk assessed and mitigated where necessary, as even simple equipment changes may introduce new behaviours that create new hazards or modify the rate of occurrence of existing hazards.

Under the auspices of the HIAL Safety Management System (SMS), the following activities will have to be undertaken:

- Assessment of the Change in accordance with the HIAL SMS;
- Production of a Safety Management Plan for the proposed change;
- Update of the Part Two Safety Case to include design changes to the system;
- Update the Part Three Safety Case to include claims, arguments and quantitative evidence from the Flight Trial;
- Update to the Part Four Safety Case to include transition into service of the change; and
- Engagement with the Regulatory Authorities.

HIAL Services

HIAL will have to manage and own the whole change process. This will require input, review and management of the process, technical changes, and technical and safety assurance documentation, and require input and effort from a number of HIAL subject matter experts.

Stage Four – Mitigation Service Provision

The Radar Mitigation Scheme will detail any requirements for through-life Mitigation Services that may be necessary to mitigate the impact for the agreed lifespan of the development.

For a windfarm development this has a lifetime of typically 25-35 years, where a Radar Mitigation Scheme utilises the HIAL Mitigation Services, then these through-life

Working with Developers

Mitigation Services will be provided for the lifetime of the development or until no longer required.

Through-Life Service Charges

The lifespan for a windfarm development is typically 25-35 years. Through-life service charges will be applied to the developer on an annual fixed fee per year, per Megawatt (MW) capacity of turbines that are within line of sight of the Primary Surveillance Radar, as set out in the Commercial Principles.

Stage Five – Decommissioning of Mitigation Service

It is a regulatory requirement for HIAL to consider and plan for decommissioning of any system implemented to provide an air traffic service. At the end of life of the Radar Mitigation Scheme for a specific development, HIAL will be required to decommission the Radar Mitigation Scheme and use of the Mitigation Service that was implemented to mitigate the effects of the development. This is a change to an assured system. As such, decommissioning of the Mitigation Service will require the same activities that were conducted at the implementation of the Mitigation Service.

Decommissioning costs will be borne by the Developer as agreed in the Mitigation Service commercial agreement.

Supporting Renewable Energy

HIAL is committed to supporting renewable energy in Scotland and will implement cutting edge windfarm mitigation technology at Inverness Airport.

Inverness Airport Windfarm Mitigation Services

HIAL has committed to the implementation of specific windfarm mitigation technology to provide a potentially suitable Mitigation Service to overcome the negative effects that some windfarms may have on Surveillance Air Traffic Services at Inverness Airport.

Developers should note that every development must be assessed on a case-by-case basis. There are many factors which will influence the decision as to whether the Inverness Airport Mitigation Service is a suitable solution; these include, but are not limited to, the location, scale, size and number of turbines planned, and radar visibility of the windfarm. This must also be coupled with the capacity and capability of the windfarm mitigation technology to provide a mitigated surveillance picture to the required safety standards above and in the vicinity of the development in question.

The cumulative effects of windfarm developments which are located in the same region must be considered. It is feasible that an established windfarm has been assessed to have no impact to air traffic services, but the subsequent development of an adjacent windfarm could be assessed to have such a cumulative effect, that both the existing and new development now require mitigation.

In cases where it is assessed that the Inverness Airport Mitigation Service is suitable to provide mitigation, then HIAL will collaborate with the developer to establish a commercial arrangement for the provision of the Mitigation Service. It should be noted that the provision of a Mitigation Service is not an ‘out of the box’ service. Each implementation is subject to significant assessment, commissioning, optimisation and validation processes, and strategies that allow the implementation to meet the statutory regulatory and safety assurance required.

Supporting Renewable Energy

Next Steps

To find out further information or to discuss your planned developments please contact HIAL Safeguarding:

safeguarding@hial.co.uk

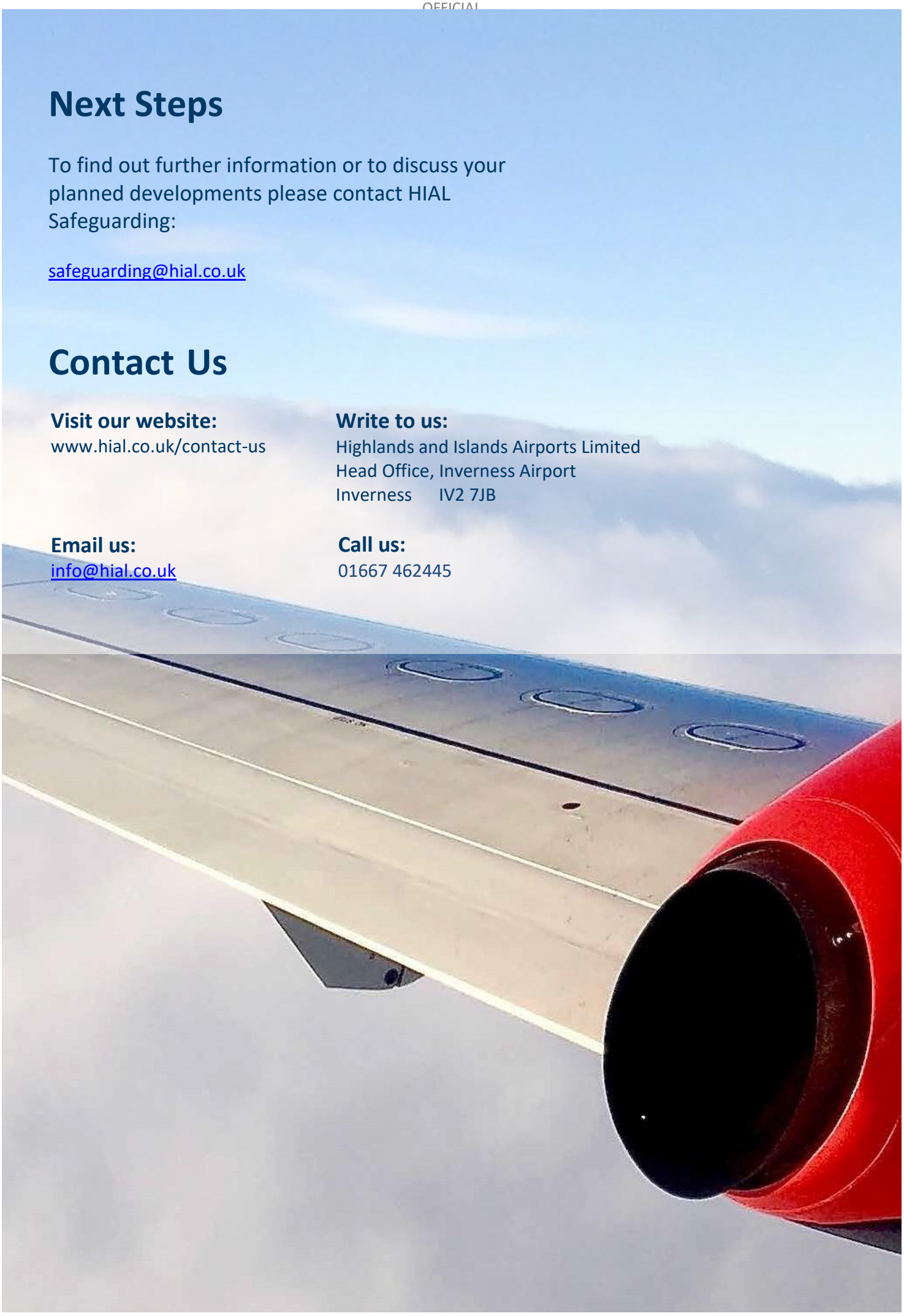
Contact Us

Visit our website:
www.hial.co.uk/contact-us

Write to us:
Highlands and Islands Airports Limited
Head Office, Inverness Airport
Inverness IV2 7JB

Email us:
info@hial.co.uk

Call us:
01667 462445



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