

AERODROME SAFEGUARDING GUIDANCE



PROPOSED DEVELOPMENTS ON AND AROUND ABERDEEN INTERNATIONAL AIRPORT

January 2013

Introduction

Aberdeen International Airport Ltd (AIA) is officially safeguarded in accordance to the criteria set out by the Civil Aviation Authority (CAA) to ensure that developments on and around aerodromes do not infringe with internationally agreed safety margins around aircraft flight paths, nor interfere with the visual and non-visual aids to navigation which guide aircraft on those flight paths. The safeguarding function is also a condition which forms part of the AIAL's Aerodrome License to operate.

As a result, proposed developments on, and up to 15km around, AIAL must undergo a process known as **Aerodrome Safeguarding**. This process ensures that alterations to the local built-up environment are carefully assessed to check that they have no adverse impact on aircraft safety. Potential aerodrome safeguarding breaches can be identified and, if necessary, amended and/or rejected in order to ensure that safety on and around the aerodrome is not compromised.

This guide is not designed to give a full insight into the conditions and regulations attached to aerodrome safeguarding, but as an overview to Developers who may be considering proposals or works close to the airfield.

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SAFEGUARDING – AN OVERVIEW

Safeguarding is achieved by a process of checking proposed developments as to:

- Protect blocks or air through which aircraft fly, by preventing penetration of surfaces created to identify their lower limits.
- Protect the integrity of radar and other electronic aid to air navigation, by preventing reflections and diffraction of the radio signals involved.
- Protect visual aids, such as Approach and Runway lighting, by preventing them from being obscured, or preventing the installation of other lights which could be confused for them.
- Avoid any increase in the risk to aircraft of a birdstrike by preventing an increase in hazardous bird species in the vicinity of the aerodrome and, whenever the opportunity arises, to reduce the level of risk.

Planning Applications and the Safeguarding Process

The Aerodrome Safeguarding Process is included in UK legislation as an integral part of the planning procedure. It is set out in Directions contained in Circulars issued under the Town and Country Planning Acts.

Local Planning Authorities (LPA's) are advised of AIAL's safeguarded area, and then consult with AIAL about any Planning Application within this area should it meet certain criteria relating to the height and location of the proposed development. In addition, any proposed developments with bird attractant properties within 13km of the aerodrome will also be referred for consultation, as will any wind turbines within at least 30km of the aerodrome.

Although planning applications are subject to the Safeguarding Process, this does not mean that they are automatically objected to; the process is in place to facilitate a detailed assessment. To enable an accurate assessment of a proposed development, AIAL requires certain information about the proposals to be provided, namely:

- The location of the OS Grid Reference (to at least 6 figures for each of easting and northings)
- The elevation of the site - to an accuracy of 0.25m Above Ordnance Datum (AOD)
- The layout, dimensions and, particularly, heights of the proposed development.
- Other information as may be necessary, for example, landscaping details to enable the birdstrike potential to be assessed, or the types of cladding materials proposed so that the potential for radar reflection can be modelled.

Physical Safeguarding

Physical safeguarding refers to the assessment of height of a proposed object, structure or building, to ensure it does not physically infringe the airport's Obstacle Limitation Surfaces (OLS). The OLS forms a complex set of 3-Dimensional surfaces, which extend upwards and outwards from the runway and are designed to protect the airspace in and around the airfield from obstacles for flight safety.

The OLS completely surround the aerodrome, but those surfaces aligned with the runway used to protect aircraft landing or taking off, can be more limiting than those surrounding the rest of the aerodrome, particularly as you get close to the aerodrome. Details of the OLS can be found in *Civil Aviation Publication CAP 168 Licensing of Aerodromes*, which is available on the internet at www.caa.co.uk/publications.

Under the terms of their Licence, aerodromes are required to take all reasonable steps to ensure the aerodrome and its airspace are safe for use by aircraft. It is for this reason that accurate information on the location and height of a proposed development within the vicinity of an aerodrome is required. The height of vehicles is taken into account when evaluating roads and parking areas within proposed developments, unless any lighting involved is taller. Railways are treated in a similar manner.

Technical Safeguarding

Technical safeguarding is the protection of Radar and other Electronic Navigational Aids against interference or disruption by obstacles or structures in the area.

In low visibility conditions, pilots are entirely dependant on the accuracy of the information displayed on the instruments in the cockpit to navigate and land their aircraft. Similarly, air traffic controllers rely on the accuracy of the information displayed on the radar screens in front of them to maintain safe separation between aircraft. It is essential, therefore, that this information has not been distorted by interference to the radio signals involved used in the operation of the navigation aids.

The Safeguarding Process is used to protect installations from:

- Radio frequency interference from other sources of radio emissions.
- Radio signal reflections or diffractions caused by physical objects.

The following sections detail the considerations taken during a safeguarding assessment.



POTENTIAL BIRD HAZARDS FROM AMENITY LANDSCAPING AND BUILDING DESIGN

Aircraft bird strikes are a major hazard on or around the airfield and pose a risk to the safety of aircraft and passengers alike. As such, AIAL is required to take necessary steps to ensure that the birdstrike risk is reduced to the lowest practicable level and spend vast sums of time and money reducing the number of bird attractants in the area.

Developers must consider the need to minimise bird attractant features of landscaping building designs in the vicinity of an aerodrome. Many of the design features of building developments and their associated landscaping are commonly attractive to birds, particularly tree and shrub planting, and the creation or enhancement of a water feature.

It is possible that as part of the mitigation, it will be necessary to produce and implement a Bird Hazard Management Plan acceptable to AIAL and the LPA.

Landscaping

Landscaping may attract birds by providing feeding, nesting and roosting habitat. Almost by definition, landscaping increases and diversifies the habitats available for wildlife, which inevitably are exploited by larger numbers of more bird species for a wider range of activities.



Significant hazards associated with landscaping schemes are their potential to:

- *Create dense vegetation that may provide roosting and nesting habitats.*
- *Provide an abundant winter food supply in the form of fruit and berries for large flocks. Birds may also move onto an adjacent aerodrome to feed on soil invertebrates.*

Measures which can be undertaken by Developers can include, but not limited to;

- Avoiding large quantities of berry bearing species. If they are essential to the integrity of the proposed planting scheme, low numbers of berry bearing plants may be dispersed amongst other species to reduce the total food supply for birds.
- Density of planting should be 4m centres or greater. Thinning out should be undertaken if necessary to ensure this is maintained. If the proposed planting is intended to provide a screening function, staggered planting in rows may be required.

- Blocks of planting should also be avoided in sheltered areas and sites isolated from human disturbance e.g. traffic islands.
- Stands of trees with the potential to grow in excess of 20m high should not be included in planting schemes within 3km of an aerodrome.

Building Design

Buildings may be used by birds depending upon the design and use of the building and the availability of food in the nearby environment. Birds may make use of ledges of buildings and roof spaces, including flat roofs whilst complex structures offer potential perches.



Wherever possible buildings in close proximity to the aerodrome should incorporate the following measures to minimise their attractiveness to birds:

- *Prevention of access to the building, including other roof space.*
- *Self closing doors to prevent access by birds or openings should have plastic strip curtains fitted.*
- *Food outlets and cafes should not have open litter bins or any areas where waste food is available to birds.*
- *Steeply pitched roofs to deter breeding gull – or roof netting.*
- *Roof overhangs kept to a minimum.*
- *Ledges beneath overhangs and external protrusions should be avoided.*
- *Where flat and/or shallow pitched roofs cannot be avoided in the design, there must be access availability by foot to all areas of the roof to ensure that any hazardous birds, nesting, roosting and loafing can be dispersed and where necessary any nests and eggs can be removed.*

As well as the building design, the following can be used to deter/disperse hazardous birds from nesting, roosting and loafing on and in building:

- **Netting for 'Green' Roofs:** The netting must be of a suitable gauge and weight to exclude target species and must be suspended at a suitable tension to ensure that this will not allow the birds to land. The netting must also be inspected on a regular basis to make sure it is in full working order.

- **Netting for 'Non Green' Roofs:** A netting system can also be used successfully on 'non green' roofs, the netting must be of a suitable gauge and weight to exclude target species and must be suspended at a suitable tension that birds landing on the netting will not cause sagging onto the roof. However, the netting must not be too taut as this will allow birds to land. The netting must also be inspected on a regular basis to make sure it is in full working order.
- **Bird Spikes:** If used on roofs these should be positioned at a density suitable to exclude the target species and completely cover the roof. If used on ledges they must be placed at sufficiently close spacing to exclude the target species.
- **Removal of Nests and or Eggs:** It is an offence to damage or remove nests and/or eggs without first obtaining the appropriate licences from Scottish National Heritage <http://www.snh.gov.uk/>. These licences can be issued for preserving air safety.
- **Inspections:** Where flat/shallow pitched roofs are concerned, inspections should be carried out weekly or more frequently if bird activity dictates, during breeding seasons, which for gulls typically runs from march to June to ensure that any hazardous birds found nesting, roosting and loafing are dispersed and any nest and/or eggs are removed . Regular inspections dictated by bird activity should also be carried out outside the breeding season and any birds should be dispersed.

Water



Open standing water and watercourses attract waterfowl which are sufficiently large and numerous to be a significant hazard. Wherever possible, open water should be eliminated from an aerodrome and its immediate surroundings. Landscaping approvals on and in close vicinity to the aerodrome should avoid the inclusion of water features including 'wildlife ponds'.

The severity of the hazard created by a proposed water feature will vary with the size and nature of the water body, its location relative to the aerodrome, existing water areas and waterfowl feeding sites. The number of water features within a local area has a cumulative effect on the hazard posed.

Where water features are absolutely necessary, measures to reduce the ecological diversity of water features and minimise their usefulness to waterfowl should be adopted and should include all of the following where applicable:

- I. **Depth:** *at least 4m deep with steeply shelving (preferable vertical) margins, to minimise bottom growing vegetation.*
- II. **Perimeter & Banks:** *Banks and edges are important for feeding, loafing and nesting. Extent should be minimised by the shape being as close as possible to circular, without bays, promontories and islands. If possible, there should be a vertical lip or fence to prevent birds from walking in and out of the water.*
- III. **Fish:** *The water should not be stocked with fish, which attract fish eating birds; nor should angling be permitted because of the food incidentally provided.*
- IV. **Netting:** *It may be possible to enclose smaller ponds with netting to exclude birds.*
- V. **Surroundings:** *Dense vegetation provides nesting cover and grazing opportunities. Paving or a long grass regime (c200mm) similar to that developed for aerodromes would be more acceptable. The grass could be managed as a meadow for wildflowers and butterflies; however, a wet meadow would attract feeding and nesting, and should be avoided.*

Bird Management Plans (BMP)

A BMP may be requested as part of a condition attached to a planning approval. Some of the requirements of the BMP will be site specific, depending on the location of the site, surrounding environs, roof type etc. As a general guide only, we may request the following measures to be included in your BMP.

- *Confirmation that access to all areas of the roof is available and by what method, to ensure that inspections can be carried out.*
- *Confirmation that inspections will be carried out year round with increased frequency during the breeding season.*
- *Confirmation that any hazardous birds found nesting, roosting and loafing will be dispersed when detected or when requested by AIA Airside Operations staff. In some instances, it may be necessary to contact AIA Airside Operations before bird dispersal takes place.*
- *Details of any dispersal methods to be used.*
- *A log to be kept of bird numbers and species utilising the roof(s).*

Further guidance on bird hazards associated with landscaping and their mitigation is contained in *Civil Aviation Publication CAP 772 Birdstrike Risk Management for Aerodromes.*



LIGHTING & SIGNAGE NEAR AERODROMES

LIGHTING

All proposed lighting must be considered with regard to its potential to provide a distraction to air crew operating in and out of the airport.

At night, and in periods of poor visibility during the day, pilots rely on the particular pattern of the aeronautical ground lights, principally the approach and runway lights, to assist in aligning them with the runway and to touch down at the correct point. Therefore, other lights should not be displayed which could distract or confuse them by being mistaken for aeronautical ground lights.

In particular, the following need to be taken into account when proposing new street or other lighting in the vicinity of the aerodrome:

- *Where the intensity of the lights, whether steady or flashing (i.e. strobe lighting) could cause glare in the direction of an aircraft approaching to land or take off.*
- *Where the colour of the light could cause it to be mistaken for an aeronautical ground light.*
- *Where, when viewed from the air, the lights make a pattern (i.e. a row of street lights) similar to an approach or runway lighting system.*
- *Where the overall illumination detracts from the effectiveness of the approach and runway lighting, particularly during periods of low visibility.*
- *Where the aeronautical ground lights are obscured from the pilot's view.*
- *Where lights 'spill' above the horizontal and cause glare to the pilots.*

To avoid confusion with aeronautical ground lights, it is recommended that flat glass full cut-off (FCO) lanterns mounted horizontally be used, so that no light is emitted above the horizontal.



This is now contained in British Standard Institution's *BS 5489 Code of Practice for the Design of Road Lighting. Part 1 Lighting of Roads and Public Amenity Areas (BS 5489 – 1:2003) section 12.2 Lighting in the Vicinity of Aerodromes*. As BS 5489 states, this guidance may also be applied to lighting other than road lighting.

No strobe, laser or flashing lights should be included in a lighting scheme on or around the airport's vicinity. The airport will assess each application against its location, and potential to cause interference with lighting.

Should any light, once installed, be reported as dangerous or confusing, there are provisions under the Air Navigation Order (ANO) which directs that lights shall not be exhibited which are liable to endanger aircraft taking off or landing, or which are liable to be mistaken for an aeronautical light. In addition, there is a provision which states that nobody should damage or interfere with any aeronautical ground light.

Owners of lights must always comply with any Notice that may be issued under the ANO to dim or extinguish lights, pending resolution of any problems that arise when the lights are in use.

Lighting Obstacles

The addition of warning lights to obstacles is intended to indicate the presence of hazards to aircraft operating visually at low level while taking off or landing at an aerodrome, particularly at night or in poor daylight visibility. The Safeguarding Process will determine whether a proposed development requires to be fitted one or more obstacle lights. This is applicable to temporary obstacles, such as cranes, as well as to permanent structures.



Where it is deemed necessary that obstacle light(s) would be required, it would be advised to the LPA as a Condition for attachment to any Planning Permission that may be granted. The Condition would state the characteristics for the light(s), which are likely to be steady red light(s) of either 200 or 2000 candelas visible from all directions. It is preferable that such lights should be illuminated at all times, rather than just during the hours of darkness.

The airport will include a condition in its response relating to obstacle lights should an application be deemed in need of such measures.

SIGNAGE



As with lighting, all proposed signage must be assessed to ensure it causes no distraction to Pilots. This is in particular reference to illuminated signage on airport, however please bear in mind that any signage erected on top of a proposed building, would need to be re-assessed due to the increase in height.



For signage situated on or close to the runway, e.g. hangar/warehouse signage, the airport may wish to run an impact test prior to full installation. Should this be deemed necessary, the developer will be asked to liaise with the airport when initially testing the signage to determine that there will be no visual effects on full installation.



Developers should minimise the use of red and white lights, and must omit from using any strobe, laser or flashing lights.



CRANAGE & OTHER TALL CONSTRUCTION EQUIPMENT

Safeguarding aspects of a proposed development do not end with the grant of Planning Permission. The methods and equipment to be employed during construction may also need to be agreed, particularly if cranes or other tall construction equipment will be involved as these tend to be taller than the proposed structure.

For a project close to the aerodrome or under approach, the attention of Crane Operators should be brought to the *British Standard Code of Practice for the Safe Use of Cranes. BS 7121: Part 1*, particularly paragraph 9.3.3 *Crane Control in the Vicinity of Aerodromes/Airfields* which states:

“The appointed person should consult the aerodrome/airfield manager for permission to work if a crane is to be used with 6km of the aerodrome/airfield and its height exceeds 10m or that of the surrounding structures or trees.”

NOTE: The Air Navigation Order makes it an offence to act recklessly or negligently in a manner likely to endanger aircraft.”

Where a crane is assessed as being close to the airport OLS, there are several mitigation measures in place that may be required before the crantage is allowed to proceed. This includes, but is not limited to;

- *The provisions of obstacle lighting*
- *Limit to the maximum operating height of crane*
- *Restrictions on crane operating times.*
- *Crane operations dependant on the runway(s) in use.*
- *Restrictions on crane operating height.*
- *Restrictions during poor visibility (whether caused by fog or low cloud).*

Crane Permits

AIAL operate a Crane Permit system where Developers must apply for a permit before operating crantage within a 6km circle of the airfield. To apply for a permit, please request a ‘Permit Request Form’ from the Safeguarding Team at safeguarding@aairport.com.

The developer should make contact at least **one month** before the crane (or other tall construction equipment) is expected on site as sometimes other bodies need to be consulted. The following details will be required:

- The **exact location** of the crane, as an OS Grid reference (to at least 6 figures for of eastings and northings), or marked on a map showing OS Grid.
- The **maximum operating height** in metres Above Ordnance Datum (AOD), or height of crane Above Ground Level (AGL) plus ground in AOD (see Note below).
- The **type** of crane/equipment (e.g. Tower, Crane, Mobile Crane etc.)
- The **radius** of the jib/boom of a fixed crane/the **area of operation** of a mobile crane.
- The intended **dates** and **times** if operation.
- Applicant's **name** and **address**.

NOTE: Heights "Above Ordnance Datum (AOD)" are those shown on Ordnance Survey maps as "above mean sea level" (amsl).

Once these details have been considered it will be determined whether the operation can proceed and whether restrictions will apply. A permit will be issued via email by AIAL setting out any restrictions that have been agreed earlier. A copy must remain with the crane for the duration of its operation and must be produced if requested by an aerodrome official or police officer.

Obstacle Lights

Where it is deemed necessary that obstacle lights are required, the characteristics for the light(s) would be specified. Normally, they would be steady red lights of either 200 or 2000 candelas, depending on height, visible from all directions and located on the highest point of the crane/equipment. For a tower crane, they should be provided on top of the tower and at the end of the jib. They should be illuminated at all times. Unserviceable lamps should be replaced as soon as possible after failure and in any event within 24 hours. The 24 hour requirement can be relaxed if pairs of lights are fitted and one is still working.

Construction Management Strategy

For a project close to the aerodrome or under approaches to the runway, it may be necessary for a **Construction Management Strategy** to be produced and agreed with

aerodrome that ensures construction does not prejudice the safe operation of the aerodrome. A Construction Management Plan might be required as a condition on any planning permission that may be granted.

In particular, but not exclusively, the construction management strategy should address the following issues:

- *Use of cranes or other tall construction equipment.*
- *Control of activities likely to produce dust or smoke clouds.*
- *The design of temporary lighting to avoid distracting pilots (see Section 3).*
- *Storage of materials, particularly compliance with height limits.*
- *Control and disposal of waste to prevent attraction of birds.*



Excavation & Earth Works

During periods of excavation or earth works, sites can experience a high level of bird activity. Birds are attracted to the insects and food sources brought to the surface during such works, and could potentially pose a risk to aircraft operating in the area.

Consideration must be taken on any works which involve such activities, and an adequate **Bird Hazard Management Plan** must be put in place to help reduce the risk of attracting birds, and measures in place to disperse them should the problem arise. The Safeguarding Team can recommend a suitable wildlife consultant to assist in such matters if required, please contact the Team at safeguarding@aiairport.com.



POTENTIAL BIRD HAZARDS FROM SUSTAINABLE URBAN DRAINAGE SCHEMES

Sustainable Urban Drainage Schemes (SUDS) are increasingly used to attenuate water flows for flood alleviation purposes and to treat contaminated water prior to discharge into watercourses. Government agencies and local planning authorities frequently require SUDS to be incorporated into designs for buildings, housing estates etc. including those near to aerodromes. Unfortunately, some SUDS designs have the potential to attract birds to the local area. Birds, especially large flocking species, can constitute a significant hazard to aircraft.

This information is a guide only and the particular circumstances surrounding individual developments (e.g. the precise location relative to the aerodrome, the numbers, behaviour and location of bird populations in the area, and the location of other bird attractive features in the local environment) will influence the final assessment of the level of risk likely to arise. Specialists in birdstrike prevention and aerodrome safeguarding should be consulted if there is any doubt as to the suitability of a particular technique for inclusion in a SUDS design near an aerodrome. This should allow unsuitable proposals to be identified at an early stage and either replaced with more appropriate designs or allow suitable mitigation methods to be identified that will allow the proposal to proceed with adequate safety margins.

SUDS Techniques

There are a number of recognised SUDS techniques, including: green roofs and rainwater re-use permeable pavements, infiltration trenches, filter drains, swales, basins, ponds and wetlands. The following describes the likely bird attractions arising from each technique, the probability that an aerodrome might object to its use, and possible mitigation measures that could be used to manage the bird attraction.

Green Roofs and Rainwater Re-Use

The provision of a short turf or other plant cover on a rooftop that would allow gulls to establish a secure base for a nest might encourage more birds to nest on that roof in preference to others nearby. Because of the uncertainties surrounding green roofs their use

close to the aerodrome should be avoided, especially where roof nesting by gulls or other hazardous birds already occurs. At other sites, a roof design that allows easy human access, coupled with a management agreement to prevent nesting by hazardous species should be employed

Permeable Pavements, Infiltration Trenches and Filter Drains

Permeable pavements and Infiltration trenches offer little to birds in terms of food, water or shelter. Indeed, their use in place of impermeable surface may be beneficial in that it prevents the formation of puddles that may attract birds to drink or bathe. Permeable pavements present no problems for birdstrike management and their use can be encouraged around aerodromes.

Swales

The attraction that swales provide to birds depends upon their size, the frequency and duration that standing water is present within them, and the type of vegetative cover that is established. Very large swales may attract birds to feed on the grassed area irrespective of the frequency with which they carry exposed water. Those that remain wet enough to support wetland vegetation, amphibians or invertebrates will offer a feeding site and possibly nesting cover for some hazardous bird species. Swales with overgrown vegetation will also provide nesting and roosting cover for birds.



Basins

As with swales, the attraction that basins offer to birds depends on their size, frequency of flooding and vegetation cover. Such sites may be seen as an opportunity to establish vegetation that enhances biodiversity objectives or that screen the basin from public view. Unless very carefully selected, such vegetation is highly likely to attract hazardous birds, and proposals of this nature will probably attract objections if located close to aerodromes.

Bird exclusion netting can be used to keep larger species out of the basin whilst allowing smaller birds, insects, amphibians, etc. access. Issues of maintenance of the net, snow loading and public health and safety all need to be considered. An alternative solution is the use of 20cm diameter plastic spheres, marketed as 'Bird Balls'. These are tipped into the basin and float on the surface of the water when the basin is flooded thus denying bird access.

Ponds and Wetlands

Ponds and wetlands are the SUDS options most likely to attract objections if proposed within the 13km aerodrome safeguarding circle. Permanent wetlands attract a variety of hazardous birds and birds moving from one wetland site to another may cross aircraft flight paths and thus create a birdstrike risk. Even if a wetland or pond is proofed to prevent access, birds will continue to visit the site to check if feeding or other resources are available and then move on to another wetland when they find they cannot reach the water.

Considerations must be made such as;

- Size of the proposed wetland
- Detailed design in terms of bank profiles, water depth, proposed vegetative cover, any further management plans
- Location in relation to aircraft flight paths and similar habitats nearby, and any proposed mitigation measures to control the birdstrike risk that are proposed

Changes to one or more of these factors may help to reduce the birdstrike risk to an acceptable level. One example of such mitigation would be the development of a dense



vegetative cover, to remove the visual attractant and hinder access, such as closed reedbed or the development of carr woodland. However suitability of such mitigation will depend on the unique set of circumstances that prevail at an individual site.

Therefore, the best option is to eliminate ponds and wetlands from SUDS designs near aerodromes whenever possible. Where they are essential then early consultation with the aerodrome is highly recommended.

Further guidance on bird hazards associated with water bodies and their mitigation is contained in Civil Aviation Publication CAP772 Birdstrike Risk Management for Aerodromes



WIND TURBINES AND AVIATION

Wind Turbine developments have the potential to impact on aviation interests in a number of ways. Further information is available in Civil Aviation Publication CAP 764 – Policy and Guidelines on Wind Turbines, which is available on the CAA website www.caa.co.uk/publications.

There are two areas of concern for wind turbine developments; physical impacts and technical (radar & electronic aid) impacts. AIAL will assess the physical impact of the development, and forward the turbine details to NATS who will assess the turbine against any technical issues, both in, around and en-route to the airport. Each wind turbine proposal must therefore be assessed on its own merits.

Physical

If the wind turbine development is located within 15km of the aerodrome there is a potential for turbines to infringe the aerodrome's Obstacle Limitation Surfaces due to the physical size of the turbines. This not only risks the integrity of the safety surfaces, but in turn may impact flight routings to and from the aerodrome.

The OLS completely surround the aerodrome, but those surfaces aligned with the runway(s) used to protect aircraft landing or taking off can be more limiting than those surrounding the rest of the aerodrome, particularly as you get closer to the aerodrome. Details of the OLS can be found in Civil Aviation Publication CAP168 - Licensing of Aerodromes.

Technical (Radar and Electronic Aids to Air Navigation)

Wind turbines may also interfere with aerodrome radar and other aids to air navigation. In low visibility conditions pilots are entirely dependant on the accuracy of the information displayed on the instruments in the cockpit to navigate and land their aircraft. Similarly, air traffic controllers rely on accuracy of the information displayed on the radar screen in front of them to maintain safe separation between aircraft. It is essential, therefore, that this information has not been distorted by interference to the radio signals involved in the operation of the navigation aids. There are two principal types of radar systems in use at

aerodromes – Primary Surveillance Radar (PSR) and Secondary Surveillance Radar (SSR) and both systems can be impacted by wind turbines.

Both types of radar signal are shown on the radar display for use by the air traffic controllers. Not all aircraft carry SSR equipment and these aircraft will show up on the radar screens as a primary return only. Primary and secondary returns will move continuously on the controller's radar screen, indicating the speed and direction of an aircraft or objects actual movement.



Filtering equipment can be used to prevent buildings, birds, weather and other objects from producing radar returns on the screen – so called radar 'clutter' but this is not effective in reducing returns from wind turbine blades. Experience of wind turbine developments that have been constructed show that the turbine blades will regularly produce radar returns that are identical to and easily confused with, those produced by small or slow moving aircraft. In addition, radar clutter produced by the turbines can mask any aircraft within the airspace above the wind turbine development that is not using SSR. In order to assure safety, traffic will often need to be given headings to avoid the area of clutter.

- **Primary Surveillance Radar (PSR)**

Primary Surveillance Radar systems send out pulses of energy which are reflected back to the radar head and the position of objects detected is plotted on the radar screen. These primary 'returns' show only the position of an aircraft or any other object that is detected by the radar system and not the height. PSR can be affected by wind turbines and will produce moving radar returns on the radar screen when the turbine blades are 'visible' to the radar head. The apparent movement of the turbines is caused by the rotation of the turbine blades 'confusing' the PSR circuitry.

- **Secondary Surveillance Radar (SSR)**

Systems send out an interrogation signal to a transponder, a piece of equipment located on board the aircraft. The on-board equipment responds with a signal that produces the position of the aircraft and other data such as height and identification data. The propagation of the SSR radar signal in space can be affected by wind turbines where the wind turbine structures are sufficiently close (empirical evidence indicates less than 15Nm).

Consultation with Aviation Stakeholders

To ensure wind turbine developments do not adversely impact on aviation interests, wind turbine developers must consult with aviation stakeholders. The LPA will advise of which stakeholders are required to be consulted as part of the Planning process, of which AIAL is a statutory consultee. Early consultation with aviation stakeholders is of vital importance to address any potential problems as soon as possible in the development process.

AIAL is happy to take queries from Developers at a pre-planning stage but please note that the airport can only assess the application against physical infringements. NATS offer a paid pre-planning service which assesses turbine developments against any potential technical impacts, of which details can be found at

<http://www.nats.co.uk/services/information/wind-farms/pre-planning-assessment/>.

AIAL will respond to all turbine applications at full planning stage via the LPA.

WHAT NEXT?

Off Airport Development

All development off airport should follow local authority planning guidelines. It is then the Local Planning Authority's (LPA) duty to present documentation to AIAL's Safeguarding Team. AIAL will then assess the proposal and respond back to the LPA with one of three responses; 'Objection' (with reasons stated), No Objection or 'No Objection with Conditions'. 'No Objection with Conditions' will offer a 'No Objection' subject to certain conditions which must be met in order for the airport to 'sign-off' the proposal. These could include conditions to do with the use of cranes, potential landscaping plans or identified bird hazards, and lighting schemes.

The AIAL Safeguarding Team are happy to offer advice and guidance on **pre-planning enquiries** prior to submission of the proposal to the LPA at full planning stage – please note however that any response will be for guidance only, and the airport reserves the right to comment fully at full planning stage.

Please email the Team at safeguarding@aiaairport.com submitting a summary of the project, including any site plans (including OS co-ordinates) and information regarding heights of the project. Details of landscaping, lighting plans and proposed craneage, if applicable, are also useful.

On Airport Development

Any development on-site must be referred to the Safeguarding Team for assessment. This will usually come after a referral from either the AIAL Engineering Team or AIAL Property Team.

For developments which are not required to go through the LPA Planning Process, please forward a summary of the project, including any site plans (including OS co-ordinates) and information regarding heights of the project. Details of landscaping, lighting plans and proposed craneage, if applicable, either via the AIAL Team you are currently working with, or to safeguarding@aiaairport.com.

The proposal will be assessed against any physical and technical impact it may have on airport operations, as well as measured against any potential bird hazard, lighting or landscaping issues that may arise. All on airport developments must also be notified to the CAA who may wish to carry out its own safeguarding assessment for larger developments.

For developments that are required to be put through the formal LPA planning process, it is the Local Planning Authority's (LPA) duty to present documentation to AIAL's Safeguarding Team. Like any off airport development, AIAL will assess the proposal and respond back to the LPA with one of three responses; 'Objection' (with reasons stated), No Objection or 'No Objection with Conditions', although we would endeavour to notify you of our decision prior to this.

The AIAL Safeguarding Team are happy to offer advice and guidance on **pre-planning enquiries** prior to submission of the proposal to the LPA at full planning stage – please note however that any response will be for guidance only, and the airport reserves the right to comment fully at full planning stage.

On no account should work commence until formal aerodrome safeguarding approval has been received.



For more information on Aerodrome Safeguarding at Aberdeen International Airport, please contact the Safeguarding Team at safeguarding@aiairport.com Alternatively, please call or 01224 725756.