

Aircraft Noise and Emissions



Aircraft Noise

Aircraft noise is widely recognised to be one of the most objectionable impacts of aviation and an important environmental issue for those living close to airports as well as further a field under the main arrival and departure tracks. Therefore, taking effective measures to control and mitigate the effect of aircraft noise is fundamental to achieving the sustainable development of the aviation industry.

The Government retains the responsibility for developing the infrastructure, economic and regulatory framework within which the aviation industry operates. Specifically, governmental responsibility for policy on aviation environmental matters, including noise and emissions, rests with the [Department for Transport \(DfT\)](#). Whilst the environmental impact of proposals for the establishment of new, or the amendment of existing, airspace are considered during the airspace change process, the CAA does not have the legal power to prevent an aircraft flying over a particular location at a particular time for environmental reasons. With regard to the legal recourse against aircraft noise disturbance, section 76(1) of the Civil Aviation Act 1982 states that

“No action shall lie in respect of trespass or in respect of nuisance, by reason only of the flight of an aircraft over any property at a height above the ground which, having regard to wind, weather and all the circumstances of the case is reasonable, or the ordinary incidents of such flight, so long as the provisions of any Air Navigation Order and of any orders under section 62 above have been duly complied with.”

Although it is acknowledged as a major environmental impact, aircraft noise is not currently a statutory nuisance in the UK. It is not covered by the Environmental Protection Act 1990 or the Noise Act 1996, which means that local authorities do not have the legal power to take action on matters of aircraft noise.

However, there are certain aircraft noise regulations and standards that apply. The [International Civil Aviation Organisation \(ICAO\)](#) recommend technical standards to limit noise from civil air transport aircraft. In common with over 180 countries, including all other EU countries, the UK adopts these standards. Aircraft and engines are independently assessed and certified for compliance with the appropriate ICAO standards before they enter service. ICAO noise standards are referred to by 'Chapter' numbers. Most of ICAO's efforts to address aircraft noise has been aimed at reducing noise at source; the reduction of noise on newer engines due to technical developments (today's aircraft are typically 75% quieter than jet aircraft used in the 1960's). All aircraft that fall within the Chapter 2 category are no longer permitted to operate in the EU other than in exceptional circumstances that must be authorised beforehand. The latest noise standard, Chapter 4, was agreed by ICAO in 2001 and was applied to all new aircraft types from 2006. It is broadly 10dB more stringent than the previous Chapter 3 standard. The establishment of a new chapter will lead to the removal of the previous chapter, which will ultimately lead to the use of quieter engines.

In 2001, ICAO member states also agreed to a balanced approach to controlling aircraft noise. This has four elements:

- Reducing noise at source - progressive tightening of noise certification standards (explained above).

- Land-use planning and management - to ensure that inappropriate developments are discouraged or prohibited around airports.
- Noise abatement operational procedures - to help minimise the noise nuisance from aircraft.
- Operating restrictions - measures to limit the access of aircraft into airports, such as night restrictions or the phased withdrawal of the noisiest aircraft types.

The 'balanced approach' is supported in the EU by Directive 2002/30/EC, which specifies the rules and procedures for introducing noise-related operating restrictions at Community Airports. This is transposed through Statutory Instrument (SI) 2003 No.1742, which applies the regulations to civil airports within the United Kingdom that have more than 50,000 movements of civil subsonic jet aeroplanes per calendar year.

In conjunction with the balanced approach, the focus of the [European Aviation Safety Agency \(EASA\)](#) is on regulations that aim to reduce the environmental impact of aviation at source, i.e. at the aircraft level in terms of products, maintenance and design. As a result, EASA produce a type-certificate data sheet for noise (TCDSN) that documents an aircraft's compliance with the applicable requirements for noise certification and records the associated EASA approved noise level(s). As of February 2008, all newly registered EASA aircraft qualifying for a Noise Certificate will be issued with an appropriate EASA certificate for noise (EASA Form 45).



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Light Aircraft, Helicopter and Microlight Noise

The CAA certifies light aircraft and helicopters for compliance with the appropriate requirements. Whilst there are no international noise standards for microlights, the [Air Navigation \(Environmental Standards for Non-EASA aircraft\) Order 2008](#) details the requirements for certain microlight aircraft to have a noise certificate.

Whilst it is possible to fit silencers to some light aircraft to reduce noise beyond the ICAO Standard, the use of a silencer could also reduce engine power and consequently aircraft performance. It would therefore be necessary to establish for each type of silencer installation whether there was any effect of the modification on both the engine and aircraft operation. If the modified aircraft was safe to fly, the CAA would approve the silencer for installation in UK registered aircraft. A noise certificate is not a legal requirement for light propeller driven aircraft registered in the UK before 1980.

Airport Noise

Responsibility within Government for policy on aviation environmental matters, including noise and emissions, rests with the DfT. However, the DfT is only directly involved in measures to ameliorate noise at 3 designated airports, Heathrow, Gatwick and Stansted. Elsewhere the Department expects civil aerodrome and aircraft operators to achieve a reasonable balance between their legitimate needs and those of the local community.

Whilst the CAA is concerned that aircraft operations are conducted safely, the configuration of local operating procedures (e.g. departure/arrival routes and training circuits) is a matter of agreement between the aerodrome operator and the aerodrome users. It is common practice for aerodrome operators to design and publish noise abatement procedures (NAPs), in order to mitigate the effect of their operations on local communities. These can be published in the UK Aeronautical Information Publication (AIP) and commercially available flight guides, advising pilots of the requirement to avoid overflying certain areas of local habitation. Whilst the establishment of NAPs suggests that an aerodrome operator is conscious of the need to fit into the wider community, it is not always possible for operators to design such procedures in areas where aircraft performance characteristics and operational requirements allow little latitude, especially in the immediate vicinity of the aerodrome. NAPs are established on a voluntary basis and the responsibility of enforcing such procedures and the decision to apply any sanctions against non-complying aircraft lies with the aerodrome operator alone. In 2008, the CAA published a document titled [Noise Considerations at General Aviation \(GA\) Aerodromes](#), which examines some of the environmental issues associated with general aviation-focussed aerodromes.

An EU directive has established arrangements to harmonise the measurement and assessment of noise from all industrial and transport sources, including from airports (2002/49/EC). The directive required the production of noise maps and the publication of action plans outlining the planned measures, or those currently being taken, to deal with noise. It is a requirement for the maps and plans to be updated every 5 years.

Through Section 5 of the [Civil Aviation Act 1982](#), the Secretary of State for Transport may designate certain aerodromes so that environmental issues must be taken into account, along with the usual safety parameters, by the CAA when exercising its aerodrome licensing function

Aircraft Emissions

As with all other forms of public transport, the Government retains responsibility for developing the infrastructure, economic and regulatory framework within which the aviation industry operates. Specifically, governmental responsibility for policy on aviation environmental matters, including noise and emissions, rests with the [Department for Transport \(DfT\)](#). The following is based on information provided by the Department.

Sustainability

At the highest level, the Government has made it clear that it is committed to a future aviation sector that is sustainable; one in which environmental considerations are properly balanced with economic and social ones. In the Integrated Transport White Paper, issued in 1998, a key principle highlighted the Governments position in believing that aviation should meet the external costs, including environmental costs, that it imposes (the so called 'Polluter Pays' principle). To that end the Government has had discussions with stakeholders on the most effective use of economic instruments, including taxes and trading schemes, to encourage the industry to limit its contribution to global warming. The DfT and [Department of Energy & Climate Change \(DECC\)](#) are jointly leading work to transpose the EU Directive to include aviation in the EU Emissions Trading Scheme (ETS) into UK legislation. All flights departing from and arriving at EU airports will be included in the EU ETS from 2012, and to comply with the Directive aircraft operators will be required to monitor emissions from 1 January 2010.

Air Quality

The Government is committed to delivering clean air and is determined to reduce further the impact that air pollution has on people's health and quality of life; the [Civil Aviation Act 2006](#) permits airports to employ a charging regime that promotes the use of cleaner, quieter aircraft. The National Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland, which was first published in January 2000, detailed commitments to achieve new air quality objectives throughout the UK. It established the framework for achieving improvements in ambient air quality in the UK to 2003 and beyond. The strategy identified the actions required at national and international level and the contribution that the Government, industry, transport, local authorities, business and individuals can make to improve air quality. This was followed by an Addendum in February 2003 which tightened several of the objectives and introduced a new one. A further Air Quality Strategy was published in July 2007, setting out air quality objectives and policy options to further improve air quality in the UK today and into the long term. The document was produced by the Department for Environment, Food and Rural Affairs (Defra) and can be accessed on their website: <http://www.defra.gov.uk/index.htm>.

Defra manages the UK's Automatic Urban and Rural Network (AURN); an air quality monitoring network that includes 120 monitoring sites throughout the UK. These sites measure levels of particulates (PM10), nitrogen dioxide, oxides of nitrogen, sulphur dioxide, carbon monoxide and ozone. The number and location of these sites are predominantly determined by the reporting requirements as set out in the Air Quality Framework Directive and the Air Quality Daughter Directives. Whilst some of the sites are close to airports, there are others located between 30-40 miles away.

The UK is obliged to achieve mandatory European limit values for various air pollutants. The First Air Quality Daughter Directive sets a limit value for NO₂ of 40mg/m³ to be achieved by 2010. Current forecasts suggest that we are unlikely to achieve the mandatory EU limit value for NO₂ set for 2010 around Heathrow and Gatwick. Where a local authority considers that one or more of the air quality objectives is unlikely to be met by the required date it must declare an air quality management area (AQMA), covering the area where the problem is expected. It must then draw up an action plan setting out the measures it intends to take in pursuit of the air quality objectives in the area. AQMA's have been established around Heathrow airport by Hounslow, Hillingdon and Spelthorne borough councils (Heathrow) and around Gatwick airport by Reigate and Banstead borough council (Gatwick).

