Australian Government

Department of Infrastructure, Transport, Cities and Regional Development

Review of the Air Navigation (Aircraft Noise) Regulations 2018 – Specialised Aircraft

Issues Paper

September 2019

Summary

Purpose

The purpose of this paper is to seek comments through consultation on a review of the Air Navigation (Aircraft Noise) Regulations 2018 (the Regulations).

The purpose of the review is to help determine the appropriate scope and breadth of future noise regulation primarily for specialised aircraft such as supersonic aircraft types and current aircraft types such as historic aircraft operations. A separate issues paper on remotely piloted aircraft will look at noise regulatory issues related to these aircraft.

Terms of reference for the review are at **Attachment A**.

The Regulations are made under the *Air Navigation Act 1920*.

Supersonic aircraft can be assessed against noise standards designed for aircraft produced prior to 1975. However, supersonic aircraft produced after 1975 would need to be assessed against the relevant standards for subsonic aircraft as a guideline, noting specifications to the maximum permitted noise limits for supersonic aircraft are not specified.

At this stage the Department is not proposing regulatory changes in relation to these aircraft but has identified the future need to clarify the noise regulatory regime which would be applied to these aircraft types as they further evolve and responding to current international standard development work in the International Civil Aviation Organization (ICAO)

Approvals under the Regulations have been given to historic aircraft, amateur built aircraft and others to fly at airshows or provide adventure flights to which noise standards do not apply.

Consideration is being given as to whether regulatory improvements can be made to the handling of historic aircraft under the Regulations by providing greater clarity on their approved use and reducing administrative burden associated with the regulatory process.

1. Regulatory Environment

1.1 Aircraft Noise Regulations

The *Air Navigation Act 1920* (the Act) gives effect to the International Convention on Civil Aviation (the Chicago Convention) which regulates all aspects of international air transport.

The Air Navigation (Aircraft Noise) Regulations 2018 (the Regulations) specify the requirements for aircraft which must have a noise certificate and the relevant international standards which must be complied with.

The Regulations also specify the requirements for those aircraft which may operate without a noise certificate where no standards apply.

Approvals under the Regulations have been granted for some time to vintage, adventure, ex- military and other historical aircraft operations for which noise standards do not apply.

1.2 Civil Aviation Safety Regulations

The *Civil Aviation Act 1988* (the CA Act) establishes a regulatory framework for maintaining, enhancing and promoting the safety of civil aviation in Australia, with particular emphasis on preventing aviation accidents and incidents.

The CA Act establishes CASA as Australia's aviation safety regulator and provides for the making of regulations.

Further details on the operation of the CA Act can be found on CASA's website at www.casa.gov.au.

1.3 Aircraft noise – what is it and how is it measured?

A moving aircraft causes air around it to be compressed, causing noise waves. Aircraft noise increases when the landing gear and flaps have been deployed, making the aircraft less aerodynamic.

The large fans at the front of an engine and from the jet exhaust, as well as propellers, also cause noise waves. As air gets compressed, it reverberates against the aircraft's surfaces and makes noise. This noise can be loudest when the aircraft is taking-off as most aircraft noise is generated by the large fans at the front of each engine and the jet exhaust.

The further away an aircraft is from the ground, the quieter it will be. Aircraft noise may become more noticeable as aircraft change engine thrust, similar to a motor vehicle accelerating, and when the flaps and landing gear are used.

Aircraft noise is also affected by humidity, air density and cloud cover. As noise waves travel, they lose energy and the higher frequency noise is absorbed by the atmosphere.

This is why a more distant aircraft is often heard as a low frequency rumble, and as it approaches the pitch becomes higher.

To comprehensively assess and measure the potential of aircraft noise several measures are used. Each of these are described below.

The Australian Noise Exposure Forecast (ANEF) system is the primary measure of aircraft noise exposure used around the vicinity of airports. It is based on average daily sound pressure levels, which are measured in decibels. Noise exposure levels consider aircraft take offs, approaches to landings and reverse thrust after landing; aircraft frequency and movements on flight paths; and average daily distribution of aircraft arrivals and departures.

Australian Standard AS 2021-2015 Acoustics – Aircraft noise intrusion – Building siting and construction (AS 2021) sets out guidance on siting and construction of new buildings against aircraft noise intrusion and the acoustical adequacy of existing buildings in areas near aerodromes. ANEF and AS 2021 are useful tools for land use planners.

Location of flights paths provides important information to members of the public around location of their house to the location of the flight paths.

Frequency based measures of aircraft noise, otherwise known as N60 (60 decibel), N 65 (65 decibel) or N70 (70 decibel), which combines a series of single event noise contours (noise levels of individual flight movements), into high noise zones.

N60 represents a 60 decibel outside noise as a 50 decibel event (the sound level considered intrusive when defining building insulation requirements under AS 2021) inside intrusion. It also captures the high frequency overflights around training airports and represents a disturbance of noise levels during night time hours.

N65 represents a more comprehensive picture of likely aircraft noise impacts in between the N60 measure (high frequency of less noisy events) and N70 measure (moderate frequency of relatively loud events).

N70 represents a 70 decibel outside noise as a 60 decibel event (the sound level that will disturb a normal conversation or activity) inside a residence with the windows open.

Further information on aircraft noise can be found at www.aircraftnoise.com.au.

2. Supersonic Aircraft

2.1 What is a Supersonic aircraft?

A supersonic aircraft under the Regulations means an aircraft that is capable of sustained level flight at a speed equal to, or greater than the speed of sound. Supersonic aircraft speeds range from Mach 1.3 to Mach 5.0.

2.2 Supersonic aircraft history

Only two supersonic aircraft were certified for commercial operations, the Concorde and the Tupolev-T144. There was only one commercial route used for the Tupolev-T144 which was Moscow to Almaty. The Concorde was only used on a handful of routes including:

- London to Bahrain, Paris to Rio de Janeiro, Paris to Caracas, Paris to Washington, Paris and London to New York; and London to Singapore.

The Concorde was banned initially in the US but was later permitted to fly to New York and Washington, although the Washington route operated only briefly noting reports of low patronage which impacted the operational cost for using such an aircraft. Concorde was withdrawn from commercial service in 2003 again reportedly with low demand and after the fatal Air France flight 4590 in April 2000.

2.3 Future development

There are many current supersonic aircraft in the research and development phase. One of the two aircraft which are closest to production is the Aerion AS2 developed by the Aerion Corporation. This aircraft has been in design and development since 2014 and is aiming to have flights from mid-2023. The aircraft is a 12 seat business jet with a speed of approximately Mach 1.6.

Another aircraft currently in design and development is the Boom Technology Overture. The Boom Technology Overture is a 55 seat passenger jet with a speed of approximately Mach 2.2. Boom Corporation have been working with the US National Aeronautics and Space Administration on a two seat demonstrator aircraft the XB-1 which is one third the size of the Boom Technology Overture to assess the sonic boom impacts and refine the airframe design prior to a larger scale prototype being developed.

Factors such as operational cost and Australia's geographical location to the rest of the world are likely to impact the introduction of supersonic aircraft in the future to Australia.

2.4 Noise

The Regulations do not require supersonic aircraft to have a noise certificate and do not specify relevant international standards which supersonic aircraft must comply with. Rather, supersonic aircraft are required to obtain an approval under section 16 before being used in air navigation in Australia.

Section 16 requires applications for supersonic aircraft to be assessed on a case by case basis, and does not specify noise standards that must be used in assessing such applications. Under Annex 16 of the Chicago Convention, noise standards for pre-1977 subsonic jet aeroplanes apply to supersonic aircraft where the application for certification was lodged prior to 1975. However, Annex 16 does not currently specify noise standards for newer types of supersonic aircraft.

As there are no current noise standards applying to newer types of supersonic aircraft, one option would be to assess such applications by using the relevant standards for subsonic aircraft as a guideline. However, these standards are of limited assistance as they do not specify the maximum permitted noise limits for supersonic aircraft where a sonic boom is created.

Supersonic aircraft have not operated commercially in Australia. A small number of demonstration flights were undertaken for the Concorde between the years 1972 to 1989, but supersonic aircraft were never operated to Australia on a regular basis.

Concerns have been raised in some countries on the community acceptability of supersonic aircraft where a sonic boom is created and whether supersonic aircraft should be limited in terms of a noise stringency standard or whether research and development should continue on supersonic aircraft before stringency standards for these aircraft are set.

2.5 Commonwealth environmental legislation

Given the nature of supersonic aircraft operations, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) would likely apply to their operations at Australia's major airports.

Commonwealth agencies and employees must obtain and consider advice from the Minister administering the EPBC Act before giving an approval/authorisation in relation to the adoption or implementation of a plan for aviation airspace management involving aircraft operations that are likely to have a significant impact on the environment. For example, for conventionally piloted aircraft, the environmental assessment processes that are in place under the EPBC Act are triggered when Airservices examine flight path design changes which are likely to have a significant impact on the environment. This includes consideration of community noise and aircraft emissions. Supersonic aircraft will likely operate within controlled airspace and would therefore potentially trigger environmental assessment requirements.

2.6 State/Territory/Local government legislation and regulations

State/Territory environmental protection legislation already regulates for noise intrusion into commercial, group centres (major shopping districts) and residential suburbs.

Some States and Territories have legislation in place that may be capable, in its terms, of applying to noise emitted by supersonic aircraft. In addition, State and Territory planning and environmental legislation apply at non-Federal airports and may regulate noise emissions. With smaller supersonic aircraft envisaged, these aircraft could potentially operate into airports under State and Territory planning and environmental regimes.

2.7 Proposed noise regulation of supersonic aircraft

The Department will develop a future regulatory position on supersonic aircraft which is informed by the continuing evolution of supersonic aircraft type, and current international standards work being progressed through the ICAO Committee on Aviation Environmental Protection.

3. Historic Aircraft

3.1 What is a Historic Aircraft?

The term historic aircraft describes an aircraft which has historical significance or importance such as an aircraft playing an important part in civil and military aviation history including particular aircraft types or models.

3.2 International Noise Standards

The Act gives effect to some parts of the Chicago Convention, which regulates all aspects of international air transport including aircraft noise standards.

Annex 16 of the Chicago Conventions sets out noise standards that apply to various types of aircraft. Under the Regulations, aircraft to which such noise standards apply are generally required to have a noise certificate, which can be issued where the relevant international standards set out in the Regulations are complied with. However, the Regulations also set out a procedure in section 14 under which aircraft that do not have a noise certificate, or do not (or cannot) comply with those noise standards, can obtain approval to operate in Australia (also called a 'noise exemption').

Traditionally this part of the Regulations (section 14) has been applied to provide approvals to historic and amateur built aircraft or other, often ex-military, aircraft to fly at air shows or other special events.

Case Study: Noise testing of former military aircraft (warbirds)

Warbirds such as the Russian Yak-52, Chinese Nanchang CJ-6A, Australian Wirraway and Trojan T34A aircraft, until recently were typically required to be issued with a historical aircraft permit issued under section 14(3)(d) of the Air Navigation (Aircraft Noise) Regulations 2018 (the Regulations).

In October 2018, Airservices conducted noise testing on these former military aircraft. This noise testing was to determine whether a permit to operate without a noise certificate could be issued under section 14(3)(a) of the Regulations to assess the extent to which the aircraft exceeds the standards is not significant.

These warbird aircraft were noise tested in accordance with international (ICAO) noise testing criteria. It was found that the Yak-52, Nanchang CJ-6A and Wirraway aircraft the extent to which they exceeded the international noise standards, was not significant and therefore could be issued with a section 14(3)(a) permit.

Whereas noise testing on the Trojan T34A showed the extent to which it exceeded the international noise standard was significant and could not be granted permission under section 14(3)(a) of the Regulations. A historical permit issued under section 14(3)(d) would need to be issued for such aircraft.

3.3 Current Regulation

The Regulations currently allow the Department to issue aircraft that are historic in nature, which do not meet current aircraft noise standards as set out in the ICAO Annex 16 Volume I, an approval to operate.

These noise exemptions are generally granted or conditions are imposed to allow these aircraft to fly privately, as well as participate at air shows and in special events such as fly pasts or provide commercial adventure 'experiences to the public'.

The Department issues over 150 exemptions each year to aircraft operators of aircraft historical importance. These exemptions permit the operator to engage in air navigation activities despite not meeting aircraft noise standards applicable to that type of aircraft under the Regulations.

Such noise exemptions are usually subject to conditions such as:

- the operator must ensure that the aircraft avoids overflying residential areas as far as practical. When the aircraft is not taking off or landing the operator, for noise abatement and safety purposes, shall overfly an area at the maximum safe and practical height for that particular area; and
- the operator is to ensure the aircraft does not overfly declared heritage or environmentally sensitive areas, such as National Parks, at a height of less than 2,000 feet for propeller-driven aircraft and 3,000 feet for jet aircraft.

3.3.1 Adventure flights

Aircraft operators who wish to participate in adventure flights must first engage in consultation. The owner or operator of these aircraft must consult with the owner of the airport in which the flights will operate and also the local government authority for the locality in which the airport is located.

Currently, historic aircraft operators are granted noise exemptions that are in force for a year. If the owner or operator wishes to conduct commercial adventure flights, they apply for an initial one year exemption. However, taking into account the outcome of consultation with the airport and local government authority, the Department will consider issuing a three year exemption where an operator has not been the subject of any noise complaints during the period of their initial noise exemption.

3.3.2 Air shows

Owners or operators of historic aircraft involved in air shows must apply for a noise exemption for each air show they wish to participate in.

3.4 Noise

Historic aircraft have been permitted to fly for a number of years under special provisions set out in the Regulations and typically have higher noise profiles compared to more modern type aircraft.

Retrofitting of historic aircraft types to reduce noise is limited due to a number of factors, including that not all of these aircraft are suitable for fitment of new technology and the significant cost will often discourage private owners of these aircraft. It is however envisaged that the number of aircraft seeking noise exemptions in the future will decrease as noise reducing technology becomes more suitable for fitment to less old, historic aircraft types.

Many historic aircraft operate at airports that are not federally leased and are owned by local councils. Their use for air shows and major events (e.g. Anzac Day fly pasts) at airports has not generated any significant community noise concerns.

Limited private operations of historic aircraft have generated few noise complaints however there have been complaints where there has been an increased number of movements and alleged flying at lower altitudes. This raises the issue as to whether the Department should impose limits on the private use of these types of aircraft including through placing conditions on aircraft use.

The Department is also looking at ways to streamline the application process for operators in applying for noise exemptions to coincide with the responsibilities of the Australian Warbirds Association Limited (AWAL) related to airworthiness certificates.

If a historic aircraft does not have a noise certificate, it is possible through noise testing for that type of aircraft to be issued with a noise certificate. Once testing is complete, if an aircraft meets

the applicable ICAO noise requirements Airservices is permitted to issue an Australian Noise Certificate.

Should an aircraft not meet the applicable ICAO noise requirements, but it is determined that the extent to which the aircraft exceeds the standards is not significant, an approval under section 14(3)(a) can be issued.

3.5 Commonwealth environmental legislation

The occasional nature of historic aircraft operations, would not generally invoke the provisions of the EPBC Act unless these operations were assessed as likely to have a significant impact on the environment.

3.6 State/Territory/Local government regulations

Some States and Territories have legislation in place that may be capable, in its terms, of applying to noise emitted by historic aircraft. State and Territory planning legislation and regulation applies at non-Federally leased airports, and may contain provisions that are, in their terms, capable of regulating aircraft noise. However, it may be that such legislation does not currently have any operation because of the Regulations. It is also the case that for adventure flights, aircraft operators must engage with the relevant local airport operator and local Government authority, which can often be the same entity.

3.7 Proposed noise regulation of historic aircraft

Against the regulatory background described in this paper and having regard to the future operations of historic aircraft in Australia the department is proposing:

a. Considering whether different conditions or limits should be placed on private historic aircraft flights as opposed to those where the aircraft is being used as part of an air show or special event.

b. Enabling historic aircraft exemptions to be granted for extended periods (e.g. three years) rather than yearly or for "one off" events.

c. Aligning the Department's issue of approved exemptions with AWAL's issuing of certificates of airworthiness.

d. Considering whether historic aircraft should continue to be grandfathered (i.e. for those aircraft operators with approvals prior to the aircraft noise regulations coming into effect) or reassessed for future operations.

Attachment A

Terms of Reference

1. The Review will be undertaken by the Department of Infrastructure, Transport, Cities and Regional Development and consider the appropriate scope and breadth of future noise regulation in relation to the operations of remotely piloted aircraft (RPA) or drones, urban air mobility (UAM), supersonic and historic aircraft.

2. The review will specifically consider:

   (a) the characteristics, nature of these aircraft operations, as appropriate, and their impact on noise exposure, including:

      (i) size, weight and design

      (ii) type of use (e.g. recreational, commercial, special category e.g. emergency services);

      (iii) operational height and location e.g. industrial/residential/rural/remote areas;

      (iv) total number or movements per day and per hour, duration and time of flights (day/night);

      (v) technological developments; and

      (vi) noise characteristics including sound level, tonal qualities and number of noise events.

   (b) the relevance to noise regulation of the aviation safety regulatory requirements and exemptions provided under the Civil Aviation Safety Regulations 1998, administered by the Civil Aviation Safety Authority (CASA);

   (c) the community acceptability of noise impacts of these types of aircraft especially in built up and residential areas;

   (d) noise standards in state, territory and local government including relevant legislation and regulations and their applicability to noise standards for these types of aircraft; and

   (e) international developments at ICAO, the US Federal Aviation Administration (FAA) and the European Aviation Safety Agency (EASA) and other applicable overseas regulators.

3. The review will examine as appropriate whether changes are required to the Air Navigation (Aircraft Noise) Regulations 2018, including considering:

      (i) applicability of aircraft noise regulations to these different types of aircraft including their different characteristics and nature of operations;

      (ii) collected data on sound measurement findings for certain aircraft, including weighted sound pressures to effective perceived noise levels and Sound Exposure Levels; and

      (iii) any future international noise certification of aircraft types such as drones and UAM.

4. The Review report, including recommendations, will be provided for consideration by the Department to the Minister for Infrastructure, Transport and Regional Development.

5. The Review report is scheduled to be completed by 31 December 2019.

Submissions

The Department will be accepting submissions until close of business **Friday 22 November 2019**. Submissions can be made electronically to noiseregulation@infrastructure.gov.au or in writing to:

Aircraft Operations
Aviation Environment Branch
Department of Infrastructure, Transport, Cities and Regional Development
GPO Box 594
CANBERRA ACT 2601

Your submission, including any personal information supplied, is being collected by the Department for the purpose of gathering stakeholder feedback, in accordance with the *Privacy Act 1988* (the Privacy Act). The Department will consider your submission in finalising proposed amendments to the Air Navigation (Aircraft Noise) Regulations 2018.

Your personal information will be stored securely by the Department. It may be used by the Department to make further contact with you about the consultation process. Your personal information will not be disclosed to any other third parties, except in the circumstances outlined below.

Submissions, in part or full, including the name of the author may be published on the Department's website at www.infrastructure.gov.au or in the Government's response, unless the submission is confidential. Confidential submissions (including author name) will not be published. Private addresses and contact details will not be published or disclosed to any third parties unless required by law.

Submissions will only be treated as confidential if they are expressly stated to be confidential. Automatically generated confidentiality statements or disclaimers appended to an email do not suffice for this purpose. If you wish you make a confidential submission, you **must** indicate this by ensuring your submission is **marked confidential**.

Confidential submissions will be kept securely and will only be disclosed in the following circumstances:

- in response to a request by a Commonwealth Minister;
- where required by a House or a Committee of the Parliament of the Commonwealth of Australia; or
- where required by law.

Please direct any queries during these consultations to noiseregulation@infrastructure.gov.au.

The Department may also disclose confidential submissions within the Commonwealth of Australia, including with other Commonwealth agencies, where necessary in the public interest.

Please note that in order to protect the personal privacy of individuals in accordance with the Privacy Act any submissions containing sensitive information, personal information or information which may reasonably be used to identify a person or group of people may not be published, even if not marked as confidential.

The Department's privacy policy contains information regarding complaint handling processes and how to access and/or seek correction of personal information held by the Department. The Privacy Officer can be contacted on (02) 6274 6495.