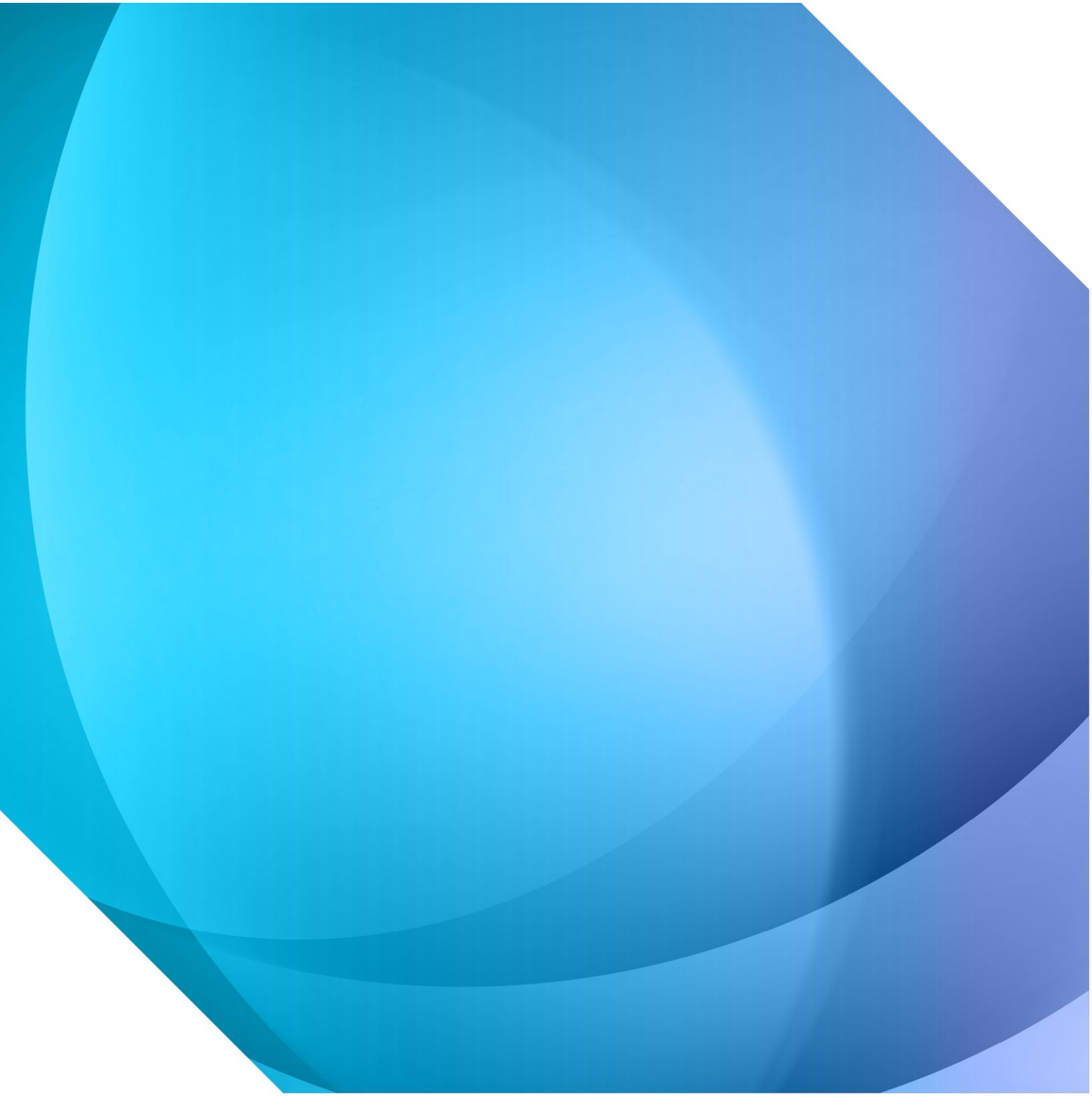
CAA Policy on Minimum Standards for Noise Modelling

CAP 2091



Published by the Civil Aviation Authority, January 2021

Civil Aviation Authority
Aviation House
Beehive Ring Road
Crawley
West Sussex
RH6 0YR

First published 2021

Enquiries regarding the content of this publication should be addressed to: noise@caa.co.uk

The latest version of this document is available in electronic format at: www.caa.co.uk

Contents

Chapter 1

Introduction

Background

1.1 In order to carry out certain of its regulatory duties, the CAA requires stakeholders (usually airports) to provide us with outputs from noise modelling. Such outputs are typically in the form of sets of 'noise contours[1]', along with the area they cover and/or the number of residents living within them.

1.2 All noise modelling is based on data about the noise emitted by flights into and out of an airport. At its most basic, these inputs can be taken from data published by ICAO[2] and other bodies. However, the data can also be adjusted to reflect actual local experiences by the use of various techniques. Implementation of the techniques to achieve this extra sophistication for noise modelling range in cost and resources required.

1.3 In this policy, the CAA specifies the minimum acceptable level of sophistication of noise modelling that can be used to provide the CAA with the outputs required for us to carry out our duties. We are publishing these requirements to provide clarity to those stakeholders that propose to make changes which may affect the noise at airports (or have other reasons to provide the CAA with noise calculations) and to provide clarity to stakeholders potentially impacted by such changes about the methodology sponsors should use to collect the data to undertake noise modelling. Publishing these requirements will also ensure a consistent approach is taken across different types of airport.

The proportionality principle

1.4 Our requirements in this policy document are proportionate; that is, in recognition of the costs involved, the sophistication with which we require an airport to model noise depends on the number of people exposed to noise at that airport. The more people exposed, the greater the sophistication that is required to be used. In general, the CAA will expect the noise analysis to be sufficient for it to carry out its duties but also proportionate to the size and likely noise effects of the airport or the proposal under consideration.

[1] A noise contour is an area within which the modelled average noise is greater than or equal to a particular value.

[2] The International Civil Aviation Organisation. www.icao.int

About this policy

1.5 This policy document defines Categories of noise modelling sophistication, describes the different situations where our duties require us to be provided with noise calculations, and sets out our requirements of the minimum Category which different stakeholder or sponsor groups should use when providing noise calculations to the CAA in order for the CAA to carry out the identified duties.

1.6 The remainder of the document consists of the following chapters:

- Chapter 2 describes the Categories of noise modelling which the CAA has defined.
- Chapter 3 describes the CAA duties which require noise calculations to be provided to us.
- Chapter 4 describes our requirements (and, in some cases, recommendations) for the appropriate Category of noise modelling which individual stakeholders or change sponsors should use to provide noise calculations to the CAA for each of those duties.

Chapter 2

The Categories of Noise Modelling

2.1 In this chapter, we describe in general how noise models are used to calculate the impact of noise on communities around airports. We also define five Categories of noise modelling to reflect the different levels of sophistication which can be used. All Categories provide valid representations on noise if applied correctly.

Noise models

2.2 The purpose of estimating aircraft noise levels in the vicinity of an airport is to provide a quantitative assessment of the noise experienced by those living near an airport. A variety of noise models are used by the aviation industry, but they all calculate noise contours from data on aircraft movements, routes, noise generation and sound propagation.

2.3 All modelling of aircraft noise is based on assessing the noise on the ground generated by each aircraft type using the airport (or airspace), then combining these in the proportions of the various different aircraft types that fly along the various different flight paths that are observed or expected, usually for an average summer[3] day or night. At its most basic level, noise can be modelled using standardised reference values provided by ICAO (for noise by aircraft type), NATS[4] (for standard flight paths), ECAC[5] (for standard dispersion either side of those fight paths) and the airport stakeholder for the mix of aircraft types and usage of flightpaths. This approach does not require the collection of actual noise levels, flight paths or flight dispersion. A noise model is then required to convert these data into noise contours within which the number of residents can be calculated from population databases

2.4 The above method does not take into account local factors, which can make a difference to the actual noise experienced on the ground. For example, flight path dispersion at a particular airport may be different to that assumed in the

[3] Summer is often used, since, in the UK, airports are likely to be busier in the summer season than in the winter season, and because residents are more likely to be outside or with windows open in the summer than in the winter, and so will be more affected by any aviation noise. Summer is defined here as the 92-day period between 16 June and 15 September inclusive.

[4] The air traffic service provider for all the UK's upper airspace and 14 UK airports. www.nats.aero

[5] The European Civil Aviation Conference. www.ecac-ceac.org

ECAC data, or operating procedures and passenger and fuel loading for an aircraft type may be different to that assumed in the ICAO noise data.

2.5 Many airports use aircraft track keeping data in order to have a record of, and sometimes make available to residents, exactly where each aircraft flies and its height above ground. It also shows how concentrated or dispersed typical flight paths are around the standard arrival and departure routes at the airport. These additional data can be used to make the noise calculation much more representative of the noise experienced. However, such a system can cost a significant sum to install and incurs annual costs to run and maintain. It also requires a level of radar infrastructure to be in place at the airport.

2.6 Some airports also use a Noise and Track-Keeping (NTK) system, which includes noise monitors to measure the actual noise experienced on the ground when aircraft fly overhead. Aircraft noise can be affected by factors such as the amount of power delivered by the engines (which can depend on the load of the aircraft or the flight path being followed), whether the undercarriage is lowered, or particular qualities and configurations of the airframe. Combining noise monitoring and track keeping data (the latter is needed to determine the position of the aircraft relative to the noise monitor when it is measured) allows a noise model to be adjusted to reflect noise from aircraft more accurately at a given airport. Noise monitors need to be sited appropriately and regularly maintained in accordance with ISO standards to be of greatest use.

2.7 Currently, the noise model used by each airport in the UK is an individual choice made by the airport, except for those airports designated for noise by the Secretary of State, where the choice is made by the CAA on behalf of the Department for Transport (DfT).

Noise modelling Categories

2.8 This CAA policy document will refer to five Categories of noise modelling. Category A is the most sophisticated, reflecting the most accurate description of the noise experienced by those living near an airport, and Category E is the least. Notwithstanding our implementation of different required levels, the methodologies described in all the Categories provide valid representations of noise if applied correctly.

2.9 **Category A**. The noise model is adapted using noise monitoring and track-keeping data collected by the airport. The noise monitors are appropriately positioned and sufficient in number[6] such that noise and aircraft position data

[6] We require noise monitoring at a minimum of two different distances from the runway for arrivals and

can be used to identify noise caused by specific types of aircraft and used to make amendments to both flight profile and noise data within the ICAO sponsored Aircraft Noise and Performance (ANP) database[7] to reflect these local effects. Where possible, noise monitors should be installed to conform with guidance provided in ISO 20906[8] and SAE-ARP-4721[9]. Flight track-keeping data is used to calculate the mix of aircraft traffic on each departure and arrival route, the actual tracks flown along each route, the dispersion of aircraft either side of the mean track and vertical flight profiles at the airport. The model uses this local data and the known or expected flight schedule to calculate noise exposure (and therefore noise contours) or other metrics.

2.10 **Category B**. The noise model is adapted using noise monitoring track-keeping and flight profile data collected by the airport. The noise monitors are sufficient in number and appropriately positioned, as for Category A. For Category B, aircraft flight profiles are adapted from the standard ICAO dataset and verified against local noise measurements, as for Category A, except that this is done only for the main noise dominant aircraft types, which must cover more than 75 percent of the total noise energy produced by aircraft at that airport[10]. The track-keeping data is used to calculate the mix of aircraft traffic on arrival and departure routes, the actual tracks used for each route, the dispersion of aircraft either side of the mean track and the flight profiles at the airport. The model uses this local data and the known or expected flight schedule to calculate noise exposure (and therefore noise contours) or other metrics.

2.11 **Category C**. The noise model is adapted using track-keeping data provided by the airport. Aircraft flight profiles are adapted from the standard ICAO dataset for the main noise dominant aircraft types, which must cover more than 75 percent[11]

---

departures respectively. The distances shall be selected to cover the extent of the 51 dB $L_{Aeq,16h}$ average summer day noise contour and capture both arrival and departure noise. This will require a minimum of four noise monitor positions. However, in practice, if arrival and departure routes overfly the same point on the ground, a single monitor position will be able to cover both arrival and departure noise, such that the practical minimum number of monitors could be two. Overflight of a position on the ground is defined in CAP 1498. This should be applied at the noise monitoring position using a minimum elevation angle of 60 degrees.

[7] https://www.aircraftnoisemodel.org/

[8] ISO 20906:2009, Amended 2013. Unattended monitoring of aircraft sound in the vicinity of airports.

[9] SAE-ARP-4721:2006. Part 1: Monitoring Aircraft Noise and Operations in the Vicinity of Airports: System Description, Acquisition, and Operation. Part 2: Monitoring Aircraft Noise and Operations in the Vicinity of Airports: System Validation.

[10] The loudness of sound is generally measured in terms of decibels (dB). Long term average A-weighted decibels (dB L_{Aeq}) take account of the frequencies people are most sensitive to, and are often used in measurements of aviation noise.

[11] Adapting flight profiles can be a labour-intensive process and so limiting the number of aircraft types

of the total noise energy. Unlike Category B, noise measurements are not required. The track-keeping data is used to calculate the mix of aircraft traffic on each arrival and departure route, the actual tracks used for each route, the dispersion of aircraft either side of the mean track and the flight profiles at the airport. The model uses this local data and the known or expected flight schedule to calculate noise exposure (and therefore noise contours) or other metrics.

2.12 **Category D**. We are consulting[12] on a definition for Category D, and will amend this policy following our consultation and in the light of the consultation responses. In the meantime, Category D is the same as Category E.

2.13 **Category E**. There is no adaptation of the noise model and standardised reference values only are used. The standard ICAO dataset is used (flight profiles, noise data), with no amendments for local effects. Data reported from the modelled airport (rather than track-keeping data) is used to identify the usage of arrival and departure routes for a typical day. The track over the ground for each arrival and departure route is derived from the published coordinates in the UK AIP[13] or as advised by the airport. Dispersion around the nominal track of each such route is based on the dispersion guidance contained in the latest version of ECAC Doc. 29[14].

covered keeps costs down.

12 See CAP 2092

13 UK Aeronautical Information Publication

14 https://www.ecac-ceac.org/ecac-docs

2.14 A summary of the Categories is shown in Table 2.1. We would consider that a stakeholder's noise modelling can only be declared to be in a particular Category if it meets ***all*** the criteria in the table for that Category.

Table 2.1: Summary of Noise Modelling Categories

Category	Aircraft noise		Aircraft tracks (arrival and departure routes)		
	Noise data	Flight profiles	Centreline (mean track)	Dispersion (variation around centreline)	Usage (allocation of traffic to routes)
A	ICAO dataset modified for local noise monitor data for all aircraft types.	Local track-keeping data	Local track-keeping data	Local track-keeping data	Local track-keeping data
B	ICAO dataset validated by local noise monitor data for major aircraft types	Local track-keeping data	Local track-keeping data	Local track-keeping data	Local track-keeping data
C	ICAO dataset	Local track-keeping data for major aircraft types	Local track-keeping data	Local track-keeping data	Local track-keeping data
D *	ICAO dataset	ICAO dataset	Local data from airport	ECAC guidance or data from airport	Local data from airport
E	ICAO dataset	ICAO dataset	Local data from airport	ECAC guidance or data from airport	Local data from airport

* the CAA is currently consulting on a new definition for Category D.

2.16 The Categories defined above differentiate between use of physical infrastructure and the data which it can provide to improve the accuracy of noise modelling. There are many other aspects to noise modelling which can be regarded as best practice, such as considerations of the terrain around an airport, placing of noise microphones correctly, using appropriate population data for converting the area of noise contours into a count of population affected, and identification of noise-sensitive buildings such as hospitals or schools. A more comprehensive list of such considerations, as well as general advice on noise modelling can be found in the latest version of ECAC Document 29. In addition to our minimum requirements to use the Category relevant to that airport as set out in this document, we continue to expect stakeholders to follow such best practice where it is appropriate to their noise modelling.

Chapter 3

CAA duties which may require provision of noise modelling

3.1 In this Chapter, we give the details of those instances where the CAA requires a stakeholder (airport, ANSP or other) to provide us with noise calculations and the types of output which we need.

3.2 In the case of airports, unless there is the need to provide noise calculations to the CAA to allow it to fulfil one of these duties, then it is up to the airport to decide (likely in conjunction with its users and local community representatives) if and how it calculates and publishes noise data.

3.3 It is only airports designated for noise by the Secretary of State that have an *ongoing* requirement to provide us with noise calculations. In all other cases, we require data only for the length of time needed for a particular process or application to be completed. However, airports may choose to continue to produce noise calculations as part of their ongoing community engagement and information provision.

i) When an airport is designated by the Secretary of State for noise

3.4 Under Section 78 of the Civil Aviation Act 1982, (CAA82) the Secretary of State for transport (SoS) can designate airports for noise purposes. Once designated, the following duty on the designated airport applies:

> *(8) The Secretary of State may, after consultation with the person managing a designated aerodrome, by order require him at his own expense—*
>
> *(a) to provide in an area and within a period specified in the order, and to maintain and operate in accordance with any instructions so specified, such equipment for measuring noise in the vicinity of the aerodrome as is so specified; and*
>
> *(b) to make to the Secretary of State such reports as are so specified with respect to the noise measured by the equipment and to permit any person authorised by the Secretary of State for the purpose to inspect the equipment on demand at any time;*
>
> *and it shall be the duty of the person for the time being managing the aerodrome to comply with the requirements of the order.*

3.5 In the 1990s, the government adopted L_{Aeq}[15] as its measure for aviation noise experienced by communities. At the time of writing, only three airports are (or have ever been) designated by the SoS for noise purposes. These are Heathrow, Gatwick and Stansted airports where, using this mechanism, the government sets noise controls. As part of these controls, the Secretary of State requires publication of annual reports on noise exposure contours, which the CAA produces for each of the three airports on their behalf. The airports must therefore provide the CAA with the necessary data to undertake this work.

ii) When a sponsor wants to change the design of airspace

3.6 The SoS has given the CAA the function to approve changes to the design of airspace in the Civil Aviation Authority (Air Navigation) Directions 2017 (as amended). Section 70 of the Transport Act 2000 (TA00) places the CAA under a general duty in relation to its air navigation functions to exercise those functions so as to maintain a high standard of safety in the provision of air traffic services. With safety as its priority, TA00 also requires the CAA to consider efficiency, the interests of all those affected, environmental guidance, national security and the UK's international obligations.

3.7 Changes to the design of UK airspace are proposed by an airspace change sponsor, usually an airport or a provider of air navigation services (including air traffic control). The CAA, as the UK's independent aviation regulator, has responsibility for deciding whether to approve changes proposed to the design of airspace over the UK – the airspace structure and instrument flight procedures within it that are used by aircraft. The CAA requires the change sponsor of any permanent change to the published airspace design to follow our airspace change process, as set out in CAP 1616[16] Part 1 or, for proposals which were instigated before 2018 and had already at that date reached a certain part of the process, CAP 725.

3.8 In order to carry out its airspace change process, the CAA usually requires stakeholders to provide us with noise calculations. Such outputs are typically in the form of sets of 'noise contours[17]', along with the area they cover and/or the

---

15 L_{Aeq} is based on an aggregation of the Sound Exposure Level (SEL) of individual aircraft overflights occurring within a given time period, and takes account of event noise level, duration and how many events occur in that time period. The most typically used aggregations include the average summer day indicator ($L_{Aeq,16h}$), calculated from the SELs occurring within an average summer day period from 0700 to 2300 or the average summer night ($L_{Aeq,8h}$), calculated from the SELs occurring within an average summer night period from 2300 to 0700.

16 www.caa.co.uk/cap1616

17 A noise contour is an area within which the modelled average noise is greater than or equal to a particular

number of residents living within them. Therefore, whenever low level[18] airspace is going to be changed, then there is a need to understand what the effect of the change in noise distribution will be on residents[19]. This is required for the following purposes:

- The CAA is required to take noise impact into account when it makes its decision. Sponsors are expected to review a number of options for change ('do nothing'[20] must be an option) and assess them for their suitability. One such assessment should be environmental and include an analysis of likely changes to noise experienced by local communities and an estimate of the impacts of noise on health and quality of life.
- Sponsors are also expected to consult residents and users on the options for the airspace change, and the CAA expects that part of the consultation material should concern the expected changes in noise and their associated impacts.
- Although the CAA is usually the decision-making body for airspace changes, the SoS can 'call in' the decision instead. Anyone can request the SoS to call in the decision, in which case the CAA must undertake an assessment of whether the airspace change meets the call in criteria. One of these criteria concerns the increase in number of residents affected by a particular level of noise due to the proposed change and so the sponsor must provide sufficient noise calculations for the CAA to be able to judge whether this criterion has been met.

iii) When an ANSP wants to change an ATC operational procedure and the proposal meets the criteria for a 'relevant PPR'

3.9 In 2017, the Government recognised that, while changes to airspace design are subject to the airspace change process, changes to air traffic control (ATC) operational procedures (which could have similar noise effects) could be implemented without consultation. Consequently, the CAA was given a decision-making role for such planned and permanent redistributions of air traffic through changes in air traffic control operational procedure (or PPRs). Essentially, a

value.

18 In this case, this means changes to the design of airspace below 7,000ft above mean sea level. Airspace changes which only affect flights above this level produce negligible noise effects on the ground.

19 Except when an ACP is sponsored by the Ministry of Defence, in which case the CAA is required by Government to disregard the environmental impact of the military operations when making its decision.

20 Here, 'do nothing' is defined to largely reflect the current-day scenario, although taking due consideration of known or anticipated factors that might affect that baseline, for example a planned housing development close to an airport, forecast growth in air traffic, or expected changes in airlines' fleet mix

PPR concerns changes in the way existing airspace is used, rather than changes in the airspace design itself. ATC operational procedures are the responsibility of Air Navigation Service Providers (ANSPs) and therefore it is only ANSPs which can propose a PPR.

3.10 Only certain PPR proposals (known as 'relevant PPRs') need to go through the relevant PPR approval process (although all are regulated by the CAA for safety purposes). These are the PPRs most likely to have a potential noise impact on the ground, determined by how they change where aircraft fly. The CAA's decision-making process for relevant PPRs is set out in CAP 1616 Part 2. The decision-making process for relevant PPRs may include the provision of noise modelling outputs as part of the assessment of and consultation upon options for the PPR.

iv) When there are changes to the operational use of the civil airspace around an airport

3.11 Direction 15 of the Airspace Directions 2017 given to the CAA concerns our role in respect of changes to the use of airspace that do not result from changes to the notified airspace design or to air traffic control operational procedures. It states that:

(1) The CAA must prepare and publish guidance on transparency and engagement for operational changes to airspace usage by aircraft (not covered by directions 4 to 8) which might have affected the noise impact on other persons.

(2) The CAA must establish and maintain a process to receive, classify and respond to complaints received by it in relation to the environmental impact (including noise) of the use by civil aircraft (including general aviation and helicopters) of UK airspace.

(3) On a request from the Secretary of State, the CAA must provide the Secretary of State with a summary of complaints received by it during a specific period, or of complaints relating to a particular issue.

3.12 Airports and ANSPs are expected to inform and engage overflown communities about aircraft operational change and change to aircraft movements when changes could have a noise impact on communities. As these changes may impact noise on the ground, airports should ensure that their local communities have sufficient information to understand the nature and causes of the change.

3.13 The CAA's guidance, published as required by Direction 15 (1) above, is described in detail from page 97 of CAP 1616. In October 2020, the CAA collected information from 10 airports and one ANSP across the UK and

provided details on which elements of the guidance they are currently fulfilling[21]. This information will be updated roughly every six months.

3.14 The CAA has no decision-making role in regard to these operational changes in airspace usage, and therefore does not require airports or ANSPs to provide us with noise calculations for this purpose. However, in this document we intend to recommend the appropriate minimum Category of noise modelling an airport or ANSP should use when engaging with communities in this regard.

v) When an airport submits a planning application for a development where the CAA is a statutory consultee

3.15 The CAA is prescribed as a statutory consultee under planning law[22] and must be consulted on all proposed applications for Development Consent relating to an airport or which are likely to affect an airport or its current or future operation.

3.16 As a statutory consultee, we will need to consider whether we see any impediments to the proposed development proceeding insofar as they relate to our regulatory roles and statutory functions[23]. If we do identify any impediments, we need to consider whether these can be appropriately managed and advise the Planning Inspectorate and SoS accordingly. In order to provide a no impediments statement, we must be satisfied that there are no unacceptable safety, economic or airspace consequences arising from the planning proposals that will prevent us giving our relevant regulatory approvals later on.

3.17 This will require the applicant to engage with us on its proposals with sufficiently detailed and mature information so that we can provide meaningful advice and commentary, and ultimately be satisfied that the 'no impediments' threshold has been met insofar as they relate to our regulatory roles and statutory functions. All applications are required to consult on and provide an Environmental Impact Assessment, and in most circumstances, this will need to include an assessment of aviation noise, which will be based on noise calculations.

---

21 https://www.caa.co.uk/Commercial-industry/Airspace/Airspace-change/Airspace-information--transparency-about-airspace-use-and-aircraft-movements/

22 Infrastructure Planning (Applications: Prescribed Forms & Procedure) Regulations 2009

23 Likely to be those concerning safety, economic regulation and airspace change.

Chapter 4

Minimum requirements for noise modelling

4.1 Chapter 3 lists the duties for which stakeholders need to submit noise calculations to the CAA. Chapter 2 defines Categories of noise modelling with different levels of sophistication; the more sophisticated the category, the more the basic noise model is adapted to reflect local factors and conditions. However, undertaking such adaptation costs time and money. As set out in paragraph 1.4, the CAA has applied a **proportionality principle** to its requirements

4.2 We have decided that the degree to which it is proportionate to require an airport to adapt the basic noise model and using what methods to do so depends on the number of people exposed to noise at that airport. The more people exposed, the greater the sophistication that is required to be used.

4.3 In this chapter we set out:

- the thresholds, in terms of numbers of residents affected, which will require the use of the more sophisticated categories of noise modelling; and
- some further criteria to ensure that airports do not reduce their noise modelling sophistication from their methodology today and that take account of instances where the cost of meeting these requirements would not be proportionate.

Thresholds

4.4 Where some noise calculation is required by the CAA, then the minimum level of sophistication of the modelling process should depend on the size of the current or proposed noise effect of an airport on its local community. In line with current Government policies for noise, daytime noise annoyance is assumed to start at 51 dB $L_{Aeq,16h}$ and night time noise at 45 dB $L_{Aeq,8h}$. These are called the Lowest Observed Adverse Effect Levels (LOAELs). The minimum assessment required by a sponsor is to see whether the options for change will make a difference to the numbers of residents affected at these levels and the distribution of residents affected by higher levels[24].

[24] For example, if the same number of residents are inside the 51 dB $L_{Aeq,16h}$ contour for both the 'do nothing' and 'do something' options, but the numbers inside the 60 dB $L_{Aeq,16h}$ contour are different, there will still be a need to undertake some noise modelling to estimate this effect.

4.5 Since the transition from one Category of noise modelling to another can involve time and money from an airspace change sponsor, and since noise contours can grow and shrink through changes in factors such as fleet mix, flight paths, or traffic volumes, there are minimum recommended and minimum mandated thresholds for each Category of noise modelling. That is, once the likely number of residents in the 51 dB $L_{Aeq,16h}$ or 45 dB $L_{Aeq,8h}$ contours reaches the minimum recommended threshold, a stakeholder should consider upgrading its noise modelling to that Category, particularly if these numbers are likely to keep growing. However, it will be allowed to keep using the lower Category until the number of residents reaches the minimum mandated threshold. The lower threshold for all noise Categories is zero, to emphasise that the CAA's requirements do not prevent a stakeholder using a higher noise modelling Category than the minimum requirement. Tables 4.1 and 4.2 shows the thresholds for each Category.

Table 4.1: Thresholds for noise modelling Categories, average summer day, population exposed to 51 dB $L_{Aeq,16h}$ or above.

Category	Lower threshold	Recommended minimum threshold	Mandated minimum threshold	Maximum threshold
A	0	400,000	500,000	none
B	0	160,000	200,000	500,000
C	0	20,000	25,000	200,000
D	0	1,600	2,000	25,000
E	0	0	0	2,000

Table 4.2: Thresholds for noise modelling Categories, average night, population exposed to 45 dB $L_{Aeq,8h}$ or above

.

Category	Lower threshold	Recommended minimum threshold	Mandated minimum threshold	Maximum threshold
A	0	400,000	500,000	none
B	0	160,000	200,000	500,000
C	0	20,000	25,000	200,000
D	0	1,600	2,000	25,000
E	0	0	0	2,000

4.6 As can be seen from Tables 4.1 and 4.2, we have set the same thresholds for population in the day and night contours for each of the noise Categories. This is because the different LOAELs for day and night already capture the difference in noise perception between day and night noise.

4.7 It will be up to the entity providing the CAA with noise calculations to demonstrate both the required Category of Noise Modelling from the tables above and to provide evidence to show that the noise modelling used by that entity meets the requirements for that Category. It will be acceptable for an entity to use its current noise modelling methodology to undertake the assessment of the required Category of Noise Modelling for that airport, even if the assessment shows that the entity needs to move to a higher Category noise modelling to provide noise calculations to the CAA for the requisite purpose. If the entity has no current noise modelling methodology, then it will be acceptable for it to use Category E to assess the required Category that applies to that airport.

4.8 There are some circumstances where the Category of noise modelling required by the CAA as indicated by Tables 4.1 and 4.2 above will not apply. These are set out in the following section.

Exceptions to our application of a category's requirements

4.9 In certain circumstances, it would not be consistent with our **proportionality principle** to require an airport to incur the very significant costs required to meet the noise modelling requirements indicated by Tables 4.1 and 4.2. We have also decided that the introduction of minimum requirements should not be used by stakeholders to reduce the sophistication of their noise modelling practices. As a consequence of these two decisions the CAA will apply the following two criteria.

No decrement criterion

4.10 This policy defines minimum requirements for noise modelling. Some airports may already be providing noise modelling at a higher Category than the minimum required here. We would expect these arrangements to persist and so no airport (or other stakeholder) should do less in terms of its noise modelling than it did on or before January 2020, when we first consulted on this policy, or 8 February 2021, when it comes into force.

No radar criterion

4.11 If an airport does not have the necessary radar infrastructure to provide the inputs needed for collecting track-keeping data, then it will only be able to calculate noise to Category D or E standard. The CAA does not consider that investment in new radar infrastructure solely to provide track-keeping data meets

our proportionality principle at this time. As a consequence, even if an airport without sufficient radar infrastructure is a Category A, B or C airport, according to Tables 4.1 and 4.2 above, the CAA does not require that airport to install radar infrastructure, a track-keeping system and/or noise monitors. Such an airport should follow the requirements for Category D airports. As with all requirement decisions, we will keep this part of our requirements under review.

4.12 However, the airport and its community should be aware that its noise modelling is likely to be of a lower sophistication than its peers (in terms of calculating noise effects) and it should consider under what circumstances that would justify the expense required to adopt the standards for a higher Category. In particular, should alternative technologies become readily available that allow track-keeping without the need for radar infrastructure, the CAA may review this criterion. At all times, it will be for the airport to justify its decision not to meet the relevant Category.

Chapter 5

The minimum noise modelling requirements that apply to each of our relevant duties

5.1 In this Chapter we set out how to use the tables and conditions from Chapter 4 to find the minimum noise modelling requirements for each of the duties which require entities to submit noise calculations to the CAA.

Designation

5.2 Airports designated for noise purposes by the Secretary of State are required to produce a range of noise contours for both the average summer day and the average summer night on an annual basis. Until 2015, these contours were then published by the DfT on its website; since 2015, they have been published by each designated airport on its website. Additionally, every five years, the designated airports are required to calculate annual average day, evening, night, and L_{den} noise contours.

5.3 The requirements for noise modelling for airports designated for noise purposes are set by the Secretary of State, rather than the CAA. Therefore, in this instance, we are only able to recommend, rather than mandate a minimum requirement for noise modelling.

5.4 The CAA would recommend any such designated airport to model noise at the Category A standard, which is the methodology followed by the airports currently so designated. Further, as with those airports now, we would expect direct access to be provided to the CAA (or other noise modelling organisation) to the system on which the track-keeping and noise monitor data is kept, rather than for them to be provided with data snapshots. This is to ensure that the data being used in the noise modelling has not been altered in any way before being passed on to the noise model.

Airspace Change

5.5 For all those airspace changes (Level 1 ACPs or relevant PPRs) for which some noise modelling will be required, the minimum level of sophistication of the modelling process should depend on the size of the current or proposed noise effect of the airport on its local community. The minimum assessment required by a sponsor is to see whether the options for change will make a difference to

the numbers of residents affected at these levels and the distribution of residents affected by higher levels[25].

5.6 In some circumstances, the airspace change sponsor may believe that no significant change in noise will arise as a result of the options for change, or that the changes will affect few or no residents. However, the sponsor will have to demonstrate this to the CAA's satisfaction. It is not practical to list here all the ways which would be acceptable, since it will depend on the circumstances of the sponsor and airspace change.

5.7 In most circumstances[26], some form of noise modelling will need to be undertaken by the airspace change sponsor. The Category of noise modelling required by the CAA is based on the number of residents in the 51 dB $L_{Aeq,16h}$ day or 45 dB $L_{Aeq,8h}$ night contours (either before or after the proposed change, whichever is greater[27]).

5.8 CAP 1616 requires an airspace sponsor to provide traffic forecasts for a period of at least 10 years from the intended year of implementation for all permanent ACPs or relevant PPRs. An airspace sponsor must use at least the highest Category of noise modelling of those indicated for their day or night noise contours for each year in this forecast period. In other words, the sponsor should assess the Category indicated in the Tables 4.1 and 4.2 for each year in the forecast period and for both day and night contours, and then should use the highest Category from that set as the minimum standard for all noise modelling in the ACP or PPR.

5.9 However, as indicated above, if an airport does not have the radar infrastructure to provide track-keeping data, then it will only be able to calculate noise to Category D or E standard. In this case, even if the tables above indicate otherwise, the CAA would only expect noise calculations to be undertaken at Category D or E standard.

How these requirements fit in with the CAP 1616 process: demonstrating to the CAA the correct category for a particular airport

5.10 As part of Gateway 2 for ACPs or the Assess and Consult Gateway for PPRs (or earlier if preferred), an entity applying for an airspace change should justify to the CAA which Category its noise modelling methodology is required to fall into from

---

25 For example, if the same number of residents are inside the 51 dB $L_{Aeq,16h}$ contour for both the 'do nothing' and 'do something' options, but the numbers inside the 60 dB $L_{Aeq,16h}$ contour are different, there will still be a need to undertake some noise modelling to estimate this effect.

26 See CAP 1616, Appendix B.

27 Even if the number of residents in these noise contours reduces as a result of the change, the numbers in other contours may increase (for example, if flights are concentrated on fewer flight paths) and so noise measurement will still be appropriate.

the definitions above, and which Category it currently falls into. It will not be permitted to proceed with the application until it can demonstrate that the methodology which it has used to reach this gateway is at least at the level of the minimum required Category as defined by this policy.

5.11 It will be acceptable for an entity to use its current noise modelling methodology to undertake this assessment, even if the assessment shows that the entity needs to improve its noise modelling methodology in order to complete the airspace change process. If the entity has no current noise modelling methodology, then it will be acceptable for it to use Category E to demonstrate the correct Category that applies to that airport.

5.12 So, for example, if an airport undertaking an ACP currently uses a methodology which puts in into Category C, it should use that same methodology to assess the numbers of residents in the day and night noise contours currently and over the next ten years as a result of its proposed ACP. If none of these results indicate that it will reach the threshold for Category B, then it can present this evidence to the CAA and proceed with the ACP. If one of them does exceed the threshold for Category B, then it will need to ensure that its noise modelling meets the requirements for Category B before proceeding.

5.13 If an entity has provided evidence acceptable to the CAA that its airspace change will bring no change to noise experienced by residents and it is therefore not intending to produce noise modelling, then it shall also not be required to undertake the analysis described in paragraph 5.10 above.

Secretary of State's Call In Criteria

5.14 Although the CAA is usually the decision-making body for airspace changes, the SoS can 'call in' the decision instead. Anyone can request the SoS to call in the decision, in which case the CAA must undertake an assessment of whether the airspace change meets the call in criteria, one of which concerns the increase in number of residents affected by a particular level of noise. Therefore, the sponsor must provide sufficient noise calculations for the CAA to be able to judge whether this criterion has been met

5.15 The Category of noise modelling used to inform the CAA's assessment of the Secretary of State's call in must be the same as that required for the airspace change options analysis.

Changes to the operational use of the civil airspace around an airport

5.16 In CAP 1616[28], the CAA has already set out its guidance for measurement and transparency in respect of both requirements to highlight and explain aircraft operational changes retrospectively through the production of information, and proactive expectations to make information available relating to aircraft movements. This section of CAP 1616 does not require the calculation of noise exposure of residents, and, being only guidance, the CAA has no decision-making role in this area. Therefore, there is no need for the CAA to specify an expected noise calculation Category at the present time.

5.17 However, if the CAA's guidance is changed in future such that there is a requirement for noise modelling, then it should at minimum be at a Category which conforms to the tables and Categories above.

5.18 Also, in deciding how to engage with its local community on these matters, an airport may choose to use noise modelling to illustrate the extent of changes experienced by residents due to operational changes to airspace usage. In these circumstances, the CAA would strongly recommend that the airport uses the same Category of noise calculation as would be the case were it applying for an airspace change.

Development Consent Order (DCO) applications

5.19 The CAA is prescribed as a statutory consultee under planning law[29] and must be consulted on all proposed applications for Development Consent relating to an airport or which are likely to affect an airport or its current or future operation.

5.20 All such applications are required to consult on and provide an Environmental Impact Assessment, and in most circumstances, this will need to include an assessment of aviation noise. The form of the Environmental Impact Assessment is usually set in a scoping consultation undertaken by the applicant and the results are reviewed by the Planning Inspectorate.

5.21 As part of our response to such scoping consultations we would recommend to the applicant that, for any noise modelling it will need to undertake, it adopts the same minimum Category as was or would be appropriate for any associated ACP or PPR or in light of the expected change in traffic resulting from the DCO application. However, in the circumstance that the effects of the development under consideration are expected to be realised over a timespan longer than 10

[28] In the section beginning at page 97.

[29] Infrastructure Planning (Applications: Prescribed Forms & Procedure) Regulations 2009

years, we would expect the assessment of the appropriate Category to take place over that development timespan rather than just the 10 year forecasts required when an ACP or PPR is assessed.

Implementation Date and Transition Arrangements

Implementation date

5.22 From 8 February 2021, these minimum requirements shall apply to all those instances when a stakeholder submits an ACP or PPR to the CAA, and it shall apply to all ACPs and PPRs that are in progress on 8 February 2021 provided they have not yet passed ACP Gateway 2 or the PPR Assess and Consult Gateway respectively.

5.23 For those ACPs which are being undertaken under the CAP 725 process, these minimum requirements shall apply only to those ACPs in respect of which a public consultation is published after 8 February 2021. For the avoidance of doubt, even if a sponsor has amended only part of its proposals after an initial consultation and is consulting only on those changes, the sponsor will nonetheless be required to update its noise modelling in respect of the entire proposal using methodology in accordance with these minimum requirements.

5.24 As noted above, the CAA's guidance for changes to the operational use of the civil airspace around an airport does not require stakeholders to undertake noise modelling, but if it is changed after 8 February 2021 such that it does require noise modelling, then these minimum requirements shall apply.

5.25 The requirements for designation are set by the Secretary of State and those for Development Consent Orders are set by the Planning Inspectorate. However, following 8 February 2021, in these instances the CAA shall propose to these decision-making bodies that these minimum requirements should apply.

Transition arrangements

5.26 The thresholds in Tables 4.1 and 4.2 have been designed to indicate to airports and stakeholders that they should consider investing in the resources necessary to comply with the next highest Category when they pass 80% of the minimum mandated threshold. However, as these minimum requirements come into force, there may be stakeholders that find themselves needing to increase the sophistication of their noise modelling before they can progress an ACP or PPR or other application.

5.27 In such cases, the CAA has determined that suitable transition periods will apply as set out below. The length of the period depends on the actions which need to

be undertaken by the airport to comply. At the most onerous, an airport may have to install a track-keeping system or noise monitors, and then collect data over a summer period to use in its noise modelling. In other cases, the data may already be available to the airport, and it may only require updating the noise modelling process to use these data more fully.

5.28 Also, at the time of implementation of these minimum requirements, the industry is dealing with the effects of the COVID-19 pandemic, which has drastically reduced traffic levels and it is at present uncertain how soon and to what extent traffic will return at individual airports.

5.29 Therefore, there will be a one-off transition period at the point these proposals come into force, which will be specific to the circumstances of each airport which requires it and notifies us that it needs to upgrade its noise modelling Category. These transition periods will be calculated as follows. The maximum transition period for those airports which must install a track-keeping system will be three years. The transition period for those airports that are required to install one or more noise monitors or to collect and process ADS-B or radar data will be two years[30]. The transition period for those airports that are required to reprocess ADS-B or radar data already held will be six months. Outside of this introductory allowance, further transition periods will only be allowed by exception and it will be up to an airport or other stakeholder to request a transition period and to provide evidence to us to justify their request.

[30] This transition period is based on the assumption that data collected in summer 2022 will be sufficient to model normal operations in the future. If this proves not to be the case, then we will decide on a case-by-case basis whether to allow a longer transition period or require 2019 data to be sourced from a third party.