

City Airport Development Programme (CADP1)

Condition 51: GROUND RUNNING NOISE LIMIT STRATEGY



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Appendix 1: Method of Calculation of Engine Ground Run Noise

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1.0 INTRODUCTION

1.1 General

1.1.1 The City Airport Development Programme (CADP1) planning application (13/01228/FUL) was granted planning permission by the Secretaries of State for Communities and Local Government and Transport in July 2016 following an appeal and public inquiry which was held in March/April 2016.

1.1.2 Condition 51 of the CADP permission requires that:

“The noise level arising from Ground Running shall not exceed the Ground Running Noise Limit.”

Prior to the commencement of the development hereby approved a strategy demonstrating how any breach(es) of the Ground Running Noise Limit through Ground Running are to be prevented shall be submitted to and approved in writing by the Local Planning Authority. The strategy as approved shall be implemented upon commencement of use of the development.”

1.1.3 Ground running of aircraft engines for test and maintenance purposes relates to the operation of aircraft engines while the aircraft is static. The engines can be operated in isolation or sometimes in unison (to stabilise the aircraft) and at varying power settings, ranging from low power to high power. The lowest power setting is often referred to as “Ground Idle” or low power ground running. High power ground running can occur at thrust settings from just above ground idle power to maximum thrust.

1.1.4 This Ground Running Noise Limit Strategy is submitted to discharge Condition 51 and is to be read in conjunction with the Ground Running, Testing and Maintenance Strategy which is required in compliance with Condition 49. This document includes:

- Section 2.0 - the strategy relating to the Ground Running Noise Limit;
- Section 3.0 - a description of the Ground Running Noise Limit; and
- Section 4.0 – procedures for preventing breaches of the Ground Running Noise Limit.

- 1.1.5 This document is aimed at setting out procedures to demonstrate how any breaches of the Ground Running Noise Limit in place at London City Airport (LCA) are to be prevented.

2.0 THE STRATEGY

2.1 Existing Provisions

- 2.1.1 Under the provisions of the Section 106 Agreement for the 2009 Planning Permission, LCA are required to provide written details of ground running and, in particular on an annual basis, calculations to show whether the Ground Running Noise Limit has been exceeded during the preceding calendar year. The Ground Running Noise Limit is defined as the noise level arising from Ground Running which shall not exceed the equivalent of $60\text{dBL}_{\text{Aeq,T}}$ (where T shall be any period of 12 hours) free field as measured outside and at 1 metre from any existing residential premises in the vicinity of LCA.

2.2 CADP Assessment

- 2.2.1 In the Updated Environmental Statement (UES) for CADP, the ground running of aircraft engines for test and maintenance purposes was recognised as a source of ground noise (see paragraph 8.312) .
- 2.2.2 Under CADP, the ground running of aircraft engines will affect the environment by virtue of noise from the altered position for ground running of aircraft at LCA. The noise levels generated by future aircraft operations will be similar to those noise levels that are currently generated from ground operations. It is however envisaged that in the future, more of the aircraft operations will be carried out by modern turbo-fan type aircraft which are generally quieter when taxiing and manoeuvring than the turbo-prop aircraft (more of the newer generation of modern aircraft will be introduced once CADP is built out - e.g. C-Series). Irrespective of whether CADP is in place or not, the future mix of aircraft at LCA will provide slightly quieter noise levels from ground operations of individual aircraft than currently exist.
- 2.2.3 With the introduction of more modern aircraft into the airport (e.g the C-series, the expectation is that the proportion of ground running for test and maintenance purposes should reduce over time, for a given number of aircraft. This will be offset to some extent by the expected increase in aircraft movements as CADP1 is built out . Condition 23 of the CADP Permission permits up to 111,000 movements per year whilst Condition 22 allows growth to 45 movements per hour.

2.2.4 In addition, when accounting for the existing and likely proposed locations for high power ground running, CADP1 will bring about a re-distribution of noise during high power ground running but is not expected to increase areas of noise exposure. As a result, ground running was not specifically assessed under CADP1. However, mitigation measures were identified in Chapter 8 of the UES (paragraph 8.363) as:-

- Maintaining a noise limit for policing the level of high powered ground runs for engine testing and maintenance purposes; and
- Limiting engine test and maintenance activities to those associated with engine rectification, rather than routine testing.

2.3 Proposed Strategy

2.3.1 Ground running for engine test and maintenance purposes shall be undertaken in a manner that ensures compliance with the Ground Running Noise Limit as described in Section 3.0 of this document. Any breach(es) of this Ground Running Noise Limit are to be prevented by the procedures set out in Section 4.0 of this document.

3.0 GROUND RUNNING NOISE LIMIT

3.1.1 The Ground Running Noise Limit is the amount of noise permitted at a specified nearby noise sensitive receptor(s) resulting from ground running undertaken for engine test and maintenance purposes.

The Ground Running Noise Limit is set out in the definitions section of the planning conditions for CADP as:

“the noise level arising from Ground Running which shall not exceed the equivalent of a free-field noise level of 60 dB LAeq,T (where T shall be any period of 12 hours) at any Sensitive Receptor”,

4.0 PROCEDURES FOR PREVENTING BREACHES OF GROUND RUNNING NOISE LIMIT

4.1 Monitoring of Ground Runs and Reporting

- 4.1.1 LCA will record written details of ground running that has taken place during the preceding calendar year including details of the number, duration and power settings of ground runs and the types of aircraft involved, in compliance with Condition 49.
- 4.1.2 Written measurements and calculations, in accordance with the procedure described in Appendix 1, will be presented annually on 1st June in the Annual Performance Report to show whether the Ground Running Noise Limit is being approached.
- 4.1.3 In the event that the Ground Running Noise Limit is approached within 1 dB, proposals for the amelioration of this issue will be submitted to the London Borough of Newham (LBN) for their approval within 3 months of the identification of this risk and, thereafter, reported in the Annual Performance Report. Such measures shall ensure that Ground Running complies with the Ground Running Noise Limit and, once approved by LBN, these measures shall be implemented within 6 months.

4.2 Noise Measurement

- 4.2.1 Prior to commencement of operation of CADP1 and every 3 years thereafter, LCA will undertake measurements to check the noise levels generated during high power ground runs by those aircraft that carry out most test and maintenance activity and/or those that are likely to generate the most noise during ground running. These noise levels will be assessed over the preceding calendar year. The purpose of the testing will be to ensure that the reference noise levels used in the calculation procedure set out in Appendix 1 are representative of the aircraft undergoing testing. The results of this testing will be submitted to LBN within 1 month of submission of the report of the results to LCA.

4.3 Monitoring of Ground Runs and Reporting during CADP Construction

- 4.3.1 During the build out of CADP1 infrastructure, the location at which ground running will take place will change at times in accordance with procedures set out in the Ground Running Test and Maintenance Strategy developed in compliance with Condition 49. During the CADP1 construction works, LCA will ensure that details of ground running, covering a period from the date of commencement of works until six months thereafter, including details of the number, duration and power settings of ground runs and the types of aircraft involved, will be submitted to LBN within six weeks of the end of this period. LCA will ensure such details are

submitted within six weeks from the end of every subsequent six month period thereafter until completion of the CADP1 works.

- 4.3.2 Written measurements and calculations, in accordance with the procedure described in Appendix 1, will be presented within six weeks of the end of the six month period(s) referred to in 4.3.1 above, to show whether the Ground Running Noise Limit is being approached. In the event that the Ground Running Noise Limit is approached within 1 dB, the procedures set out in 4.1.3 above will be carried out.

APPENDIX 1

Method of Calculation of Engine Ground Run Noise

Calculation Method

To assess engine ground run noise at the nearest Sensitive Receptor, the following steps are necessary:

- (A) From the Airport Ground Run Record Sheets, determine the monthly number and duration of high power ground runs made at the Ground Running Location during the year. (NB. The current Ground Running Location is on Stand 24 at the east end of the apron). Determine the longest duration of such runs in a month during the year, x minutes.
- (B) Then compute the average daily duration during the worst months ie. $\bar{x} = y$ minutes
- (C) Then compute the resultant noise level at the reference distance of 152 metres in terms of the dB $L_{Aeq,12hr}$, ie.

Resultant Noise Level at 152 metres

$$= \text{Reference Noise Level}^1 + 10.\log(\text{Duration}(y)) - 10.\log(12 \times 60)$$

$$= \text{Reference Noise Level} + 10.\log(y) - 28.6$$

- (D) Then compute the consequential noise level at the nearest residential premises by allowing for the greater distance of these properties (d) from the aircraft than the reference distance of 152 metres and any consequential screening (S dB).

Noise Level at nearest residential premises

$$= \text{Resultant noise level at 152m} - 26.7.\log(d/152) - S$$

¹ Reference Noise Level is the sound pressure level at a distance of 152 metres produced during a high power ground run by an aircraft typical of that operating at LCA. In previous years, a value of 84 dB L_{Amax} has been used based on studies undertaken at the airport.

The result of this calculation can then be compared directly with the Ground Running Noise Limit of 60 dB $L_{Aeq,12h}$ to determine whether this limit has been approached or met.