TOWN AND COUNTRY PLANNING ACT 1990 - SECTION 77 AND TOWN AND COUNTRY PLANNING (INQUIRIES PROCEDURE) (ENGLAND) RULES 2000

APPLICATIONS BY LONDON ASHFORD AIRPORT LTD

SITE AT LONDON ASHFORD AIRPORT LIMITED, LYDD, ROMNEY MARSH, TN29 9QL

SECOND SUPPLEMENTARY PROOF OF EVIDENCE OF

MALCOLM SPAVEN MA (Hons) MSc

on behalf of Lydd Airport Action Group

on

AVIATION OPERATIONAL ISSUES

PLANNING INSPECTORATE REFERENCE: APP/L2250/V/10/2131934

LPA REFERENCES: Y06/1647/SH and Y06/1648/SH

INQUIRY DOCUMENT REFERENCE: LAAG/10/H

DATE: 25 February 2011

1. Introduction and scope of evidence

1.1 My qualifications and experience are set out in Section 1 of my main proof of evidence.[LAAG/10/A]

1.2 In this second supplementary proof of evidence, I address one particular point relating to aircraft operations and flight paths arising from Mr Maskens' rebuttal proof.[LAA/3/D] I am submitting written evidence on this point in advance of my oral evidence at the inquiry because the issue is technical in nature and requires reference to additional documents.

1.3 The point addressed in this second supplementary proof of evidence relates to the question of whether the existing configuration of the Instrument Landing System (ILS) at Lydd Airport will permit the airport to declare the full length of the extended runway as being available for landing, or will impose limitations on that declared distance.

1.4 For reference, this point is raised in my own and Mr Maskens' submitted evidence as follows:

- my main proof, LAAG/10/A, paragraphs 7.26 to 7.31
- Mr Maskens' main proof, LAA/3/A, paragraph 8.5
- my rebuttal proof, LAAG/10/E, paragraph 2.35 and Table 2
- Mr Maskens' rebuttal proof, LAA/3/D, paragraph 5.4

1.5 Appendices to this proof of evidence are submitted as document LAAG/10/I. That document also contains other appendices to which I shall make reference in my evidence.

2. Landing distance available on the extended runway 21

2.1 In paragraph 5.4 of his rebuttal proof Mr Maskens addresses the long-standing issue of the impact of the runway extension on the landing distance available using the runway 21 ILS – an issue first raised by LAAG in response to the airport's October 2007 SEI. [CD 3.3, Appendix 1, paragraph 3.12] In summary, it is my submission that, because the ILS localiser (horizontal guidance) is at an offset angle from the extended runway centreline, when the runway is extended, ICAO regulations will require the landing threshold to be moved south westwards, resulting in less than the full runway length being available for landing. The airport has consistently denied that this will be the case.

2.2 Mr Maskens continues to maintain, in paragraph 5.4 of LAA/3/D, the airport's position that the full Landing Distance Available of 1799 metres will be available on the extended runway 21, but now gives the new information that this will be achieved by using "a similar solution to the CAA approved procedure at Sumburgh Airport". I have studied the ILS configuration at Sumburgh. A copy of the ILS procedure chart for runway 27 at Sumburgh is in Appendix 1 to this proof.[LAAG/10/I]

2.3 In order to explain the calculations set out below, Appendix 2 to this proof illustrates the various dimensions of the ILS. These are as follows:

- a is the elevation angle, in degrees above the horizontal, of the glideslope (the vertical guidance component of the ILS)
- b is the height (in feet) of the glideslope above the threshold of the runway – known officially as the Reference Datum Height (RDH)
- c is the height (in feet) of the glideslope above the elevation of the runway threshold at the point where the offset ILS localiser beam intersects the extended runway centreline
- d is the distance from the runway threshold to the point where the localiser beam intersects the extended runway centreline
- e is the angle by which the localiser beam (the horizontal guidance component of the ILS) is offset from the runway centreline.

2.4 Turning to the Sumburgh runway 27 ILS procedure shown in Appendix 1, the localiser is offset by 2.6° from the final approach track and the localiser course crosses the final approach track at a distance of 723 metres (0.3904 nautical miles) from the runway threshold. The glideslope angle is 3° (equivalent to 318 feet per nautical mile) and the Reference Datum Height is 56.1 feet. In other words:

a = 3°
b = 56.1
d = 723 metres or 0.3904 nm
e = 2.6°

2.5 'c' is the height of the glideslope at the point where the localiser course crosses the final approach track. From Appendix 2 it can be seen that this will be:

b + (d x 318) feet

which is

56.1 + (0.3904 x 318) feet

2.6 For the Sumburgh runway 27 ILS, the resulting height of the glideslope at the point where the localiser intersects the final approach track – measurement 'c' as shown in Appendix 2 - is therefore 180.2 feet. Consequently the Sumburgh runway 27 ILS <u>just</u> meets the ICAO Annex 14 Standard [see LAAG/10/A, Appendix 26] that the glideslope/localiser/final approach track intercept height must be at least 180 feet above the elevation of the runway threshold.

2.7 The equivalent calculations for the Lydd ILS, with its localiser aerial remaining in its current location, demonstrate that it cannot meet the ICAO 180ft intercept height criterion with the extended runway. Replicating the calculation above for the Lydd ILS in relation to the extended runway, the localiser will be offset by 5°; the localiser course will cross the final approach track at a distance of 571 metres (0.3083 nautical miles) from the runway threshold; the glideslope angle will be 3.5° (equivalent to 370 feet per nautical

mile) and it is assumed that the Reference Datum Height will continue to be at its present value of 47 feet. In other words:

a = 3.5°
b = 47
d = 571 metres or 0.3083 nm
e = 5°

2.8 The height 'c' of the glideslope at the point where the localiser course crosses the final approach track is therefore:

$$47 + (0.3083 \times 370) = 161.1 \text{ feet}$$

2.9 As can be seen from Table 1 below, 161.1 feet is some 19 feet less than the ICAO (and UK CAA) required minimum, and therefore such a configuration would not be ICAO-compliant. In order to meet the minimum 180ft intercept height requirement, without moving the localiser so that distance 'd' is increased (see Appendix 2), the airport could raise the RDH.[1] However as row C of Table 1 shows, the RDH would have to be raised to 65.9 feet in order to achieve an intercept height of 180 feet. But ICAO Annex 10 recommends that the RDH for a Category I ILS on a Code 3 runway is 50 ft, with a tolerance of up to plus 10 feet. The UK accepts and implements this recommendation.[2] Consequently an RDH of 65.9 ft is not acceptable.

2.10 If the maximum permitted RDH of 60ft was applied at Lydd, as row D of Table 1 shows, this would only raise the intercept height to 174.1 ft – not enough to meet the ICAO minimum of 180 ft. In any case, raising the RDH is self-defeating, because it means that aircraft will cross the runway threshold at a greater height and will therefore land further down the runway – in other words, it has the effect of reducing the landing distance available, precisely the opposite of the purpose.

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1 This can be done by positioning the glideslope aerial further away from the runway threshold, so that the glideslope is higher as it crosses the threshold.

2 Although the CAA also permits the RDH to be up to 10 feet less than 50 ft, as in the current Lydd case (UK AIP GEN 1-7-34).

Table 1: Lydd ILS configuration						
		Glideslope angle (degrees)	*Descent gradient (ft per nautical mile)*	*Reference Datum Height (ft above threshold)*	*Localiser/ centreline intercept point (m from threshold)*	*Glideslope height at intercept point (ft)*
A	Current Lydd r/w 21 ILS	3.5	370	47	900	226.8
B	Extended Lydd r/w 21 ILS	3.5	370	47	571	161.1
C		3.5	370	65.9	571	180
D		3.5	370	60	571	174.1

2.11 Since there are no options available at Lydd to meet the 180ft intercept height criterion by adjusting the RDH, the only way the airport can meet this requirement is by increasing distance 'd' in Appendix 2, i.e. by displacing the designated runway threshold from the end of the runway to a point further south west. This will mean that officially declared Landing Distance Available (LDA), which aircraft must use in their landing performance calculations, will be less than the 1799 metre length of the extended runway.

2.12 I conclude from the above that the Sumburgh example quoted by Mr Maskens does not provide a mechanism by which Lydd Airport could configure its ILS so that it meets ICAO and CAA approval criteria and simultaneously allows the full runway length to be declared as LDA.

2.13 In the absence of evidence from the airport that shows how the Sumburgh – or any other - example demonstrates that Lydd Airport can achieve the ICAO minimum required 180ft intercept height with its existing ILS localiser aerial, I maintain my position that the ILS configuration at Lydd will mean reducing the declared Landing Distance Available to something less than the full runway length of 1799m. This will be a further constraint on the viability of commercial air transport operations at Lydd Airport.
