Safety and Airspace Regulation Group

[redacted] Gatwick Airport

[redacted] Gatwick Airport Limited

14 August 2013

GATWICK RNAV 1 SIDs AIRSPACE CHANGE PROPOSAL – DECISION

REGULATORY DECISION

Following evaluation and analysis of the Gatwick Airport Limited (GAL) RNAV SIDs Airspace Change Proposal (ACP), and following consultation with the DfT, I have approved the implementation of the new RNAV1 SIDs for implementation on 14 November 2013. Approval is given subject to a DfT conditional requirement outlined herein and a number of Safety and Airspace Regulation Group (SARG) Regulatory Requirements detailed at Annex A. A summary of the CAA case study is below.

CAA ACP ANALYSIS AND IMPLEMENTATION SCHEDULES

Whilst the content of the ACP met CAA requirements to enable analysis of the operational elements, consultation process and environmental impacts, the evaluation of these elements of the ACP was completed within the planned timescales before the end of January 2013. [redacted]

On reflection, it would appear delays have arisen for a number of reasons:

- [redacted]

- [redacted]

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[redacted]

- [redacted]

- [redacted]

- [redacted]

- [redacted]

ACP EVALUATION AND REGULATORY REQUIREMENTS

Justification.

[redacted] As there were a number of references to the UK PBN policy, and as the FAS is a cornerstone for development of UK airspace and improved and more environmentally efficient departure and arrival routes, the CAA supported the concept behind the Gatwick RNAV SID proposals. Whilst the aim is to replicate the existing conventional SIDs as far as possible, the CAA accepted that there are benefits to be realised by reducing the width of the departure swathes, although it is recognised that there are impacts of concentration arising from the use of RNAV SIDs.

Options.

Some options were examined for design of SIDs using Route 2 (SFD Rwy 08) and Route 4 (CLN/LAM/DVR/BIG). Following ACP analysis and written exchanges between the SARG Case Officer and Mgr ATS, it was recognised that options had been considered and discounted for a number of operational reasons.

Clarity of Diagrams.

Diagrams to show existing conventional SID and proposed RNAV SID centrelines, and track dispersion plots were clearly shown in the ACP at Figures 2-14, and PDF versions were supplied with selectable layers showing populations, heat density plots of departing aircraft, conventional and RNAV centrelines, together with the NPRs portrayed, and these versions were all acceptable for the ACP. As noted later, it was unhelpful that there were some issues with diagrams used in the consultation material as clarity in the consultation was degraded which necessitated updated versions to be included in the Gatwick consultation web-site.

Validation of SIDs (Flyability and Database validation).

[redacted]

Continued (2 of 9 pages)

- BIG1X (impacts CLN3X, LAM1X, DVR1X during the first 2 turns).
- BOGNA1X / HARDY1X.
- DAGGA1X (impacts TIGER1X and WIZAD1X).

As a consequence, implementation of the aforementioned RNAV SIDs is still subject to satisfactory flyability assessment. [redacted]

Prior to the effective date of the SIDs (14 November 2013) there is a requirement to have the database coding validated for each SID as detailed in the Validation of IFPs policy statement section 7. If the database validation is unable to be completed by the effective date of the SIDs, then NOTAM action will be required to delay the effective date.

CONSULTATION

The consultation was completed in accordance with the SARG (then DAP) requirements. It was apparent that there was close liaison between GAL and GATCOM during the consultation and the public events were instrumental in raising the profile of the consultation, although there is no evidence that hastening emails were used.

Given the high level of public interest in Gatwick operations, the level of engagement was as expected. The actions of the sponsor in conducting the consultation were adequate despite the fact that a number of issues had been raised by SARG prior to and during the consultation and these were not acted upon until further pressure was brought to bear. This was a somewhat reactive approach which was criticised by some of the consultees who were opposed to some parts of the proposal. With the benefit of the experience gained during this consultation, the CAA recommends that more attention to detail is given regarding clarity on diagrams and associated explanatory detail in supporting text when the sponsor considers further consultation activity due with the LAMP ACP.

Given the environmental sensitivity of proposals such as these in the vicinity of airports, it was unsurprising that some respondents chose to challenge the application of the process rather than commenting on the proposals themselves. Whilst the use of the consultative committee has proved to be a suitable vehicle for consultation there have been some weaknesses that could have been mitigated by a better understanding of the limitations of using these standing forums.

SUMMARY OF ERCD ENVIRONMENTAL ASSESSMENT

The Environmental Research and Consultancy Department has undertaken an assessment of the environmental impact of this change; the findings are summarised at Annex B.

The ERCD report concluded that whilst an overall environmental benefit cannot be demonstrated, standard noise metrics required under CAP725 (L_{eq} contours, 90 dBA SEL footprint) would be unlikely to show any change as a result of this proposal. Equally, any impact on CO_2 emissions would in all likelihood be negligible, and there is not likely to be any impact upon LAQ.

In line with current Government guidance, the introduction of RNAV will generally result in fewer people being overflown. Of the four trialled SIDs, the distributions (below 4,000ft) on Routes 1 and 3 show that traffic is concentrated along a path similar to that of traffic on the conventional SID. On Routes 2 and 4, the portrayed distribution (below 4,000ft) of traffic on the RNAV SID is different to the traffic on the conventional SID, although it is wholly contained within the NPR swathe on Route 2.

Continued (3 of 9 pages)

On Route 4, supplementary analysis has been conducted to quantify the effect of changes in flight track distribution within the NPR swathe. Both Gatwick Airport's and our own analysis has shown that the RNAV trial SIDs have not affected the departure climb profile, thus changes in noise exposure are entirely related to the lateral disposition of flight tracks within the swathe. Noise exposure on the ground is dependent on both the shift in track over the ground and the altitude of an aircraft – noise impact of a shift in ground track lessens with increasing aircraft altitude. At 4000ft amsl, a shift in ground track of 750m causes a change in single event SEL of 0.8dBA. A 500m shift causes a change in SEL of 0.3dBA. These changes related to comparisons between two flights. As indicated above, safety requirements of including altitude constraints at some waypoints during the early turns are beyond the scope for completing an environmental assessment as these changes are safety orientated and cannot be changed.

On Route 4, taking into account the overall changes in track distribution, noting there is little change in ground tracks for one-third of departures on Route 4, the overall change in noise exposure at any location below 4000ft amsl is likely to be no more than 0.5dB., Changes in noise exposure that do occur are at noise exposure levels far below those normally considered in assessing aircraft noise impact.

As such I am content that the change is unlikely to be significant in environmental terms.

ROUTE 4 – IMPACT ON EXISTING NPR SWATHE – DfT CONDITIONAL APPROVAL

Staff from the SARG appraised DfT of the situation regarding Route 4 indicating that the impact of the introduction of the Route 4 RNAV SID was deemed to be insignificant given the altitude aircraft will achieve before they leave the lateral swathe of the NPR, the length of time flown outside the NPR swathe below 4000ft (estimated to be up to 20 secs) and given the existing swathe of departures flown by aircraft following conventional procedures. The DfT has issued a condition such that the impact of using the Route 4 RNAV SID design must be assessed against the revision to the Air Navigation Guidance (ANG) to the CAA following consultation and re-issue of new ANG guidance in 2013. The condition is included in Annex A.

POST IMPLEMENTATION REVIEW

Given that the proposal includes a post implementation management oversight process, and that a number of comments responding to the consultation made comment on the methodology to be adopted for withdrawing RNAV SIDs if major issues arise, the CAA needs to be appraised of the methodology to be adopted. Details are to be clarified with the SARG Case Officer as detailed in Annex A.

The potential for Route 5 to have an impact on Dormansland remains to be seen; given the very small amount of feedback from Dormansland, GAL needs to review the impact of the new Route 5 RNAV SID and determine what (if any) action is required to address any post implementation issues. Requirements are detailed in Annex A.

Requirements regarding implementation of RNAV SIDs on Route 4 are subject to a conditional approval from DfT. Requirements are at Annex A.

Requirements for a Post Implementation Review for all ACPs (normally one year after implementation) are detailed in a DAP (now SARG) Policy Statement as published on the CAA Web. A PIR is required one year following implementation on 14 November. A link to the CAA is provided in Annex A. Should any matters materialise in the meantime, GAL should liaise with the SARG Case Officer to determine any action ahead of these PIR requirements.

Continued (4 of 9 pages)

CONCLUSION

[redacted]

Subject to resolution of the outstanding flyability issues, the PIR requirements and remaining Regulatory Requirements as highlighted in Annex A, I am content that the RNAV SID designs may be implemented in full. Consequently, I am approving implementation of RNAV 1 SIDs on 14 November 2013. Should you have any queries with issues highlighted in this letter, please address them in the first instance to the SARG Case officer who will progress as appropriate.

RECOMMENDATIONS

1. The CAA recommends that GAL pays more attention to detail regarding clarity on consultation diagrams and associated explanatory detail in supporting text when the sponsor considers further consultation activity due with the LAMP ACP.

2. [redacted]

Mark Swan
Director

Annex A: Regulatory Requirements Prior to Implementation.
Annex B: Summary of ERCD Report.

ANNEX A TO
DECISION LETTER
DATED 14 AUGUST 2013

IMPLEMENTATION OF GATWICK RNAV SIDS ON 14 NOVEMBER 2013 – CONFIRMATION OF REGULATORY REQUIREMENTS

1. Following implementation of Route 5 RNAV SIDs, (Rwy 08 straight ahead - BIG1Z, CLN1Z and DVR1Z, Gatwick Airport Limited (GAL) is to monitor track-keeping of departures in relation to the existing conventional SID track dispersion and nominal track, and determine if there is an impact to Dormansland. Initial results of this process are to be provided to the CAA SARG, Airspace Regulation (AR), following a period of realistic track data gathering (details to be agreed). If there is a detrimental impact to Dormansland, GAL is to consider repositioning waypoint KKE 02 to improve track dispersion to better replicate the conventional traffic distribution, advise the CAA, and arrange for a design revision to be submitted to the CAA for regulatory approval.

2. GAL is to advise the CAA of the specific post implementation track keeping assessment methodology (as highlighted in the consultation) prior to implementation. As a post implementation management oversight process proposed that should any RNAV1 SID be deemed to be of such detrimental effect, it could be withdrawn, GAL is to to confirm these arrangements and provide clarity to the CAA (SARG) on what GAL deems to be a detrimental effect. GAL Monthly reports are to be provided to the SARG in a format to be agreed until such time the CAA no longer require further updates.

3. A Post Implementation Review (PIR) is to be completed one year after implementation in accordance with the DAP Policy Statement: http://www.caa.co.uk/application.aspx?catid=33&pagetype=65&appid=11&mode=detail&id=4823

4. Following the implementation of the following RNAV 1 SIDs: Rwy 26 CLN, DVR, LAM, BIG, BOGNA/HARDY and TIGER/DAGGA/WIZAD, GAL are specifically to provide track dispersion plots for one month of departing traffic to illustrate details required in Appendix 1.

5. GAL is comply with a DfT conditional requirement in respect of Route 4 NPR as follows:

> 'On 25 June 2013, the Department for Transport issued a consultation on its proposed new guidance from the Secretary of State to the CAA on its environmental objectives. The approval on Route 4 is therefore given subject to the condition that the airspace change relating to Route 4 will take into account the new guidance from the Secretary of State when this is issued, and in particular ensure that there is an appropriate match between the Standard Instrument Procedure and the Noise Preferential Route. GAL will need therefore to review and assess whether Route 4 meets the parameters of Noise Preferential Routes as defined within the new guidance and consult within a 12 month period, commencing from the publication date of the new guidance to the CAA on its environmental objectives (which is expected to be before the end of 2013), on any changes necessary to ensure that Route 4 does meet the parameters of Noise Preferential Routes as defined within the new guidance.'

Continued (6 of 9 pages)

6. In light of the 2012 CAP232 aerodrome surveyedobstacle data which necessitated revisions to the RNAV SID designs (inclusion of an additional altitude constraint), GAL as owner of the SIDs, is to instigate a review of the existing conventional SIDs and then submit to SARG IFP for approval as detailed in CAP 785 no later than 31 January 2014.

7. GAL, is to make arrangements with NATS LTC is advised to remind ATC staff that, as with existing conventional SIDs, controllers are to take action necessary to ensure aircraft using the HARDY1X, KENET1X/1Z, SAM1X/1Z and DAGGA1X RNAV SIDs will remain within CAS (the replicated SIDs result in flight outside CAS towards the end of the SID profiles).

Continued (7 of 9 pages)

ANNEX B TO
GATWICK RNAV SIDs DECISION LETTER
DATED 14 AUGUST 2013

SUMMARY OF ERCD REPORT

INTRODUCTION

This is a summary of the Annex E report prepared by ERCD titled "Gatwick PRNAV SID Replications" for DAP (dated 18 January 2013). The report described the environmental considerations relevant to the proposed introduction of RNAV SIDs at Gatwick Airport.

POINTS OF NOTE

Due to increased accuracy of aircraft adhering to the RNAV SID centreline, traffic dispersion is reduced thereby reducing the populations over flown, all other things being equal. This should reduce the number of people affected by the noise from departing aircraft, but is likely to result in some people being overflown more often. Additionally, if the route is actually moving because the RNAV SID cannot replicate the conventional SID exactly, it may not necessarily be true that in all cases fewer people will be affected.

For this proposal, the dispersion of traffic is likely to change on some of these Routes even though that dispersion may be contained within the NPR swathe. For example, some of the Routes (particularly those with turns after departure) will experience a more concentrated dispersion once RNAV SIDs are implemented.

Based on the evidence presented by the sponsor, it was concluded that the changes would be unlikely to have an impact on the L_{eq} noise contours or the 90dBA SEL footprints. This was either because the expected traffic dispersion resulting from the new RNAV SID was comparable to the existing traffic dispersion; or any difference in dispersion occurs beyond the 57dBA contour and the 90dBA SEL footprint.

As introducing RNAV SIDs is not expected to increase traffic numbers or to change vertical profiles[1], to a large extent the noise impact therefore represents a redistribution of noise. As noted, this will generally mean some people experiencing an increase in overflights due to the nature of RNAV and its improved track-keeping, and others that are currently beneath the wider dispersion experiencing fewer overflights. However, on two of the Routes (2 & 4) there appears likely that there will be a shift in concentration that is not entirely due to traffic becoming more concentrated around the existing traffic pattern.

- On Route 2 conventional traffic is on a wider dispersion and is concentrated to the west of the NPR centreline whilst the RNAV traffic is concentrated on a path to the east of the NPR centreline.

- On Route 4 conventional traffic has a wider dispersion, mostly to the west of the NPR centreline after the right-hand turn but largely within the NPR swathe. The RNAV traffic is more focused and initially has a similar path to the conventional traffic, but a small percentage of traffic is shown to exceed the limit of the NPR swathe, for a brief duration before they reach 4000ft.

[1] Unless the safety requirement to include altitude constraints at a number of waypoints due to revised 2012 obstacle data causes a slight increase in vertical profiles.

Continued (8 of 9 pages)

The CAA considered the need for undertaking an emissions assessment on the assumption that the RNAV SIDs would replicate the existing conventional SIDs, with no changes to fleet mix, traffic volumes or vertical profiles. It was concluded that a CO_2 assessment would not be required as any increase or decrease in fuel burn and CO_2 emissions would be minimal, and that the likelihood would be no change overall.

The CAA considered the need for undertaking an LAQ assessment on the assumption that the RNAV SIDs would replicate the existing conventional SIDs, with no changes to fleet mix, traffic volumes or vertical profiles. It was concluded that a LAQ assessment would not be required as there would be no impact on LAQ as a result of this proposal.

CONCLUSIONS

An overall environmental benefit cannot be demonstrated. Standard noise metrics required under CAP725 (L_{eq} contours, 90 dBA SEL footprint) would be unlikely to show any change as a result of this proposal. Equally, any impact on CO_2 emissions is likely to be negligible, and there is not likely to be any impact upon LAQ.

However, in line with current Government guidance, the introduction of RNAV will generally result in fewer people being overflown, assuming all other things being equal. Of the four trialled SIDs, the distributions (below 4,000ft) on Routes 1 and 3 show that traffic is concentrated along a path similar to that of traffic on the conventional SID. On Routes 2 and 4, the portrayed distribution (below 4,000ft) of traffic on the RNAV SID differs to that on the conventional SID, as outlined above.

Continued (9 of 9 pages)