

POST-IMPLEMENTATION REVIEW OF GATWICK RNAV SIDs:
THE CAA'S INFORMATION GATHERING PROCESS

Proposed changes to the structure of UK airspace are initiated, considered, refined, approved and implemented in accordance with the Airspace Change Process as set out in the Airspace Charter (CAP 724) and the associated guidance within the CAA Guidance on the completion of the application of the Airspace Change Process (CAP 725).

Stage 7 of the Airspace Change Process is the Post Implementation Review (PIR), the purpose of which is to assess and validate the success of the airspace arrangement against the benefits identified in the airspace change proposal and to review any operational issues that may have arisen since the introduction of the change.

The CAA's PIR assessment is a robust, comprehensive and iterative process. In the course of that process, after the initial request for information from the change sponsor, a number of further enquiries, or requests for data or information, are typically made by the CAA.

In its letter of 14 August 2013 to Gatwick Airport Limited (GAL) (the CAA's decision letter), the Civil Aviation Authority (CAA) highlighted the requirement to commence the process of a PIR one year after implementation of the RNAV SIDs Airspace Change Proposal on 14 November 2013.

INFORMATION REQUESTED FROM GATWICK AIRPORT LTD
(THE CHANGE SPONSER)

Initial Request for Information

By letter dated 7 November 2014, the CAA wrote to GAL in respect of the Gatwick RNAV SIDs PIR. It requested the following information in order to carry out its assessment:

- 1. Provide a tabular breakdown of monthly number of flights for each route (Routes 1-9) for Conv and RNAV flights from 14 August 2013 to 14 November 2014 (covers period before the change on 14 November 2013).*

2. *Confirmation of date when GAL changed policy of being an 'on request' RNAV SID to RNAV SIDs becoming the default for operators.*
3. *GAL to identify and detail flight track variation on each route (Route 1-9) in relation to the anticipated nominal track portrayed in the RNAV SID consultation and the RNAV SIDs ACP.*
4. *If applicable, GAL to explain the reasons for any conclusions it has reached (and the evidence which has lead to those conclusions) as to why there are track differences regarding dispersion and concentration to those expectations (if any) portrayed in both the RNAV SID consultation and the RNAV SIDs ACP.*
5. *GAL to identify whether there is any apparent difference to how SIDs are being flown by different aircraft types, what evidence that action has gathered and whether there are variances with aircraft using similar or different FMS equipment.*
6. *With regard to all Routes, please provide specific details as indicated below:*
 - a. *Track data "heat" plots, (of the same quality and detail to those used in the consultation and ACP), showing track data up to 3900ft¹ with a like for like comparison (in traffic numbers) for RNAV against Conv SIDs to demonstrate the duration of flights outside the NPR lateral Swathe for one month periods for Dec 13, Mar 14, Aug 14, Sep 14 and Oct 14. Additionally, provide a comparative traffic sample for conventional SIDs from an equivalent period in the preceding year (should there be insufficient conv SIDs to compare with in the same period). The main objective is to show like for like. **Please illustrate numbers of flights and the periods on all diagrams for comparison purposes.***
 - b. *Illustrate all RNAV Waypoints on the diagrams.*
 - c. *As per 6a but for altitude bands 4000ft - 7000ft (by 1,000ft intervals) to show when radar vectoring may take place, with pre-implementation comparatives.*
 - d. *To assist with evaluation of any anomalies in track deviation from that anticipated following implementation, illustrate the prevailing winds and provide any analysis of the effect these have had on track distribution for the periods provided (2000ft and 5000ft winds).*
 - e. *For Route 4, a representative selection of aircraft: A319/320, B738, A330, B747, B767, A380, please show **indicated** airspeeds achieved around Route 4 waypoints at KKW04, KKN06, and KKE14.*
7. *The CAA needs to see feedback from the regular operators concerning flyability of the SIDs. We therefore ask that you pass the following questions to the members of the FLOPSC. Responses should be returned by you with the GAL PIR submission.*
 - a. *How do crews receive RNAV SID clearances – are they via ATC or datalink?*
 - b. *Comment on the lateral track keeping and report any anomalous behaviour.*

- c. *Comment on the use of speed constraints in the SID designs - are they working or causing conflict with SOPs.*
 - d. *Comment on the vertical profiles of the SIDs - are they working or causing conflict with SOPs?*
 - e. *What noise abatement departure procedure (NADP) is being employed when flying the SIDs?*
8. *Please provide minutes of the Consultative Committee relating to these routes and their operational use.*
 9. *Indicate whether NPR compliance has been achieved on all routes and if not explain why, including the evidence GAL has used to reach that conclusion. If NPR compliance is not being achieved what steps has GAL taken to achieve compliance?*
 10. *Details of comments received from members of the public and representative groups which GAL believe are associated to RNAV SIDs with an individual breakdown on routes 1-9 for period 14 November 2013 – 14 November 2014. Please provide a database of (a) date comment received (b) name (c) postcode.*
 11. *Copies of any correspondence sent by GAL to local noise groups, GATCOM or the GACC in relation to these routes.*
 12. *Please provide track dispersion diagrams for Routes 1-9. (Please ensure these diagrams are provided in the revised format that was used for the additional inclusion of the Route 1-9 diagrams added to the RNAV consultation website on 1 October 2012 prior to the end of consultation. This will enable formal publication in the PIR report and enable all interested parties to compare the impacts of the RNAV SIDs against that portrayed in consultation.)*

Note: These diagrams also need to illustrate the position of the SID design waypoints so that the CAA can analyse how the SID designs are being flown against the designed nominal tracks.
 13. *Please include an option to show the 3900ft and 4000ft cut off points for comparison with the details shown in the consultation (unless the 3000ft vectoring is applied – in which case highlight where appropriate). Where feasible, colour coding should illustrate altitude attained by the relevant waypoints.*
 14. *Traffic samples should reflect one month periods as highlighted in paragraph 6a. Where runway utilisation would mean that these periods do not reflect enough track data, provide alternative (yet representative) months to reflect the monthly periods to illustrate the SID dispersion plots.*
 15. *For each route please illustrate the vectoring altitude where the restrictions of 3000ft/4000ft apply, and where aircraft are being routinely vectored off the SID and include some written explanations or reasons why aircraft are vectored in the relative positions.*

16. *Prior to implementation, GAL considered that the changes would have a neutral impact upon CO₂ emissions. Please advise whether the evidence based upon actual traffic since implementation reveals whether the impact has been as expected.*
17. *Regarding the CAA decision letter dated 14 August 2013, Annex A paragraph 1 regulatory requirements, please advise of your results regarding the track-keeping in relation to Dormansland, and whether in GAL's view any adjustments to SID designs may be required.*
18. *Regarding the CAA decision letter dated 14 August 2013, Annex A paragraph 2, regulatory requirements, which stated:*

'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 RNAVI SID be deemed to be of such detrimental effect, it could be withdrawn, GAL is 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'

Please advise what the methodology is and what action GAL has taken in respect of the post implementation track keeping assessment methodology, and provide confirmation on what GAL deems to be a detrimental impact.

19. *Regarding the requirement that the conventional SID be reviewed by GAL (as set out in the CAA's decision letter dated 14 August 2013, Annex A paragraph 6, regulatory requirements) what action has been taken?*
20. *GAL stated that there would be quarterly reports to NATMAG as part of a Monitoring Oversight Process. Have these been produced and if so, please provide copies. If not, please advise why.*

Further enquiries, or requests for data or information

These were contained in 9 emails dating from 29 January 2015 to 20 April 2015:

- (1) By email dated 29 January 2015, CAA (AAA) noted that some good diagrams had been provided, but that there were a number of areas where the CAA considered details to be either incomplete, unclear or potentially misleading. The following queries were made:

"Item 3:

- *There are dispersion plots for two routes (08 SFD & 26 LAM) rather than nine? The CAA requested details for the 9 routes and was expecting to see diagrams similar to Figures 2-13 in the proposal document, namely “heat plots” for each of the routes, with a key that shows % concentrations for both pre-implementation and post-implementation. Please advise if these details are elsewhere and if so please reference them. If not please provide them.*
- *There are no explanatory details or key to explain altitude variation – it’s all orange; additionally, the density key needs to be explained. This is a reoccurring theme for most diagrams. Please provide an appropriate brief to explain how the details can be interpreted. **Note:** diagrams will have to be published on the CAA PIR report which will be available for public viewing, therefore it is essential that the public will be able to interpret what the altitude variation and density plots annotations mean so they (and the CAA) can correctly understand the diagrams.*
- *We are unable to differentiate between RNAV tracks and conventional tracks due to a lack of labelling. For example, for samples in 2013, RNAV trial SIDs were still being flown. If these are shown in conventional dispersion plots, this will skew the data; likewise if RNAV tracks are not filtered out in the conventional diagrams, we are unable to distinguish between them. Please ensure all diagrams are therefore labelled clearly (applies equally to all other diagrams).*
- *For Rwy 26 LAM plots, it is unclear whether this is for the LAM RNAV SID or for all Route 4 SIDs – please clarify and update the diagrams.*

Item 4:

- *Are the NAX flights the only flights where GAL believes there is a variance against what was expected as demonstrated in the Trial and shown in consultation?*
- *Please advise when Norwegian first commenced operations using the RNAV SIDs.*
- *Please advise if there was an expansion in Norwegian operations and when this occurred (e.g. have there been particular dates when they introduced new routes / increased frequency of operations?)*
- *Please confirm that the data provided in Submission Folder 7 (7a-e word document) correlates with this data shown).*

Item 6 - On slides which show traffic numbers for multiple routes there is no individual breakdown. It is impossible to gauge this against numbers requested in Item 1 as the periods are different. A meaningful comparison against Conv procedures needs to be demonstrated. Please therefore provide statistics for route usage which can be compared between the diagrams and the stats for the equivalent periods.

Item 6a – The titling of the documents containing the slide shows is confusing and differ from what is shown in the slides. For example, what is meant by 08 CAA Maps (what is the significance of titling the document CAA Maps?). We also expected to see, as was requested, diagrams showing cut off altitudes at 3,900ft (Item 13). These appear to be missing – please clarify and supply diagrams to show the cut off altitudes.

Item 6c:

- *It is completely unclear where are the diagrams are for pre-implementation comparatives? This is critical to be able to demonstrate the impacts of the RNAV SIDs against what was anticipated when the CAA made its decision to change the airspace design in August 2013.*
- *The swathes are coloured blue which has the effect of masking the tracks of the same colour. Can the swathes be uncoloured (but retain a boundary)? There is no clear titling of diagrams to show which are RNAV departures and conventional departures. The Slides need to be re-titled to make this clear – **this comment and request is applicable to all diagrams.***

Item 13 – The details have not been provided – please supply (see also above in 6a).

Item 15 – This fails to indicate that the altitude overnight (2330-0600L) is 4000ft for all SIDs; this should be stated as per AIP AD 2.21 Note 8.

Item 18 - Not yet provided. GAL to provide.

Item 19 – This response is incomplete. GAL to advise what action was required in respect of the conventional SID given the obstacle issue raised. Once clarified, this response will be reviewed by SARG IFP to review.

Item 20 – there is only one report provided (Sept 2013?) and that is solely a report on uptake rates rather than performance or compliance. Are there no other reports, and if so, does that mean the quarterly Monitoring Oversight Process was not complied with?”

(2) By email dated 30 January 2015, CAA (AAA) stated that it was impossible to commence a formal assessment of the data supplied due to the lack of explanatory details and missing information. CAA asked for a revised resubmission by 5 February 2015 at the latest.

(3) By email dated 1 February 2015, CAA (AAA) sought the following additional information:

“Can you confirm you will show the individual CONV & RNAV slides for the periods post implementation so we can do a meaningful comparison - a like for like comparison in terms of similar numbers of tracks is preferable, e.g. so we can see Slide 9 (1549 deps for conv SIDs in July 2013 against the same number of RNAV tracks in July 2014 (assuming there were at least 1549 in 2014). If I compare Slide 9 (1549 conv in July 2013) to Slide 1 (1451 all deps in June 2014) that is a nice comparison, but I don't know how many deps are RNAV in June and how many are conv.

As we have not seen the individual numbers for any month for RNAV v Conv we don't know the spread of distribution in each month - (the stats showed mid month periods) which is why it was difficult to do a like for like comparison.

If I compare slide 9 - July 2013 (1549 conv SIDs) against slide 7 - July 2014 (all 1043 deps) I don't know what the numbers of RNAV departures are as all deps will cover conv and RNAV - at least that is how I read that, so the post implementation slides need to be specific with the RNAV labelling.

Can you confirm you will add explanations to explain the keys for altitude and density plots?”

(4) By email dated 3 February 2015, CAA (AAA) forwarded the following queries:

“In the PowerPoint presentations:

- Where was the speed data obtained from (e.g. radar, mode S etc) and is it ground speed or indicated airspeed ?*
- Can WPs be added to the maps.*
- Need better differentiation between the NPR swathes and track line colours used. What about using a grey for the NPR swathes for at the moment blue is used for the NPR and some track lines..*
- Do they have the weather data that relates to the maps?”*

(5) By email dated 10 February 2015, CAA (AAA) made the following enquiries:

- a request for heat plots/density plots with a percentage key that explained the colours used (at least for Route 4);
- a request for portrayals of conventional and RNAV traffic for the pre-implementation period; and
- a clarification of the titling of data.

(6) By email dated 18 March 2015, CAA (ERCD) requested details of the post-implementation NPR swathe compliance for all routes.

- (7) By email dated 26 March 2015, CAA (ERCD) sought clarification as to the time, periods and altitude bands of the maps showing night time movements.
- (8) By email dated 15 April 2015, CAA (ERCD) requested, in the absence of GAL being able to produce equivalent heat plot track diagrams with a % key, other means of determining what percentage of flights exceed the boundary of the NPR swathes whilst below 4,000ft.
- (9) By email dated 20 April 2015, CAA (ERCD) requested that GAL complete a table containing the relevant information in the absence of heat plots in the same format as those used for the consultation and proposal.
- (10) By email dated 24 June 2015, CAA (ERCD) requested that GAL re-check and confirm the details for NPR compliance on Route 5 are correct
- (11) By email dated 24 June 2015, CAA (ERCD) requested that GAL supply the “overflight” analysis that was undertaken for GAL, which compared the number of people and households that are overflown by aircraft on both the conventional and RNAV SIDs.