

Combat Air Training Airspace – Post Implementation Review

CAP 2588

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Executive Summary

The CAA's airspace change process is a seven-stage mechanism that is set out in detail in CAP1616. Under this process the Ministry of Defence submitted proposals to the CAA to increase the size of the EG D323 Danger Area complex. Stage 7 of this process is a Post Implementation Review (PIR) that normally begins one year after implementation of the change. The CAA commenced the PIR of the impact of its decision and the implemented change on 4 January 2021. The content and outcome of that review process by the CAA is discussed in detail in this report including its annexes.

On 2 January 2018 the CAA introduced a new process for making a decision whether or not to approve proposals to change airspace design. Irrespective of whether the CAA decision to approve the change was made under the previous process (set out in CAP 725), we will conduct all PIRs in accordance with the process requirements of CAP1616. However, when assessing the expected impacts against the actual impacts we will use the methodology adopted at the time of the original CAA decision in order to do so.

During the review process, the CAA considered the data provided by the ACP Sponsor in their PIR report and feedback from NATS submitted during the 28 day PIR window.

As a result the CAA has reached the following conclusions:

- The CAA is satisfied that the changes implemented by this ACP have achieved the aims and objectives with overall impacts as anticipated.
- Therefore we can confirm that the design satisfactorily achieves the objective and terms of the CAA's decision, and the change is confirmed.

This report, and its annexes, provide a summary of the information the CAA has reviewed and taken into account before reaching these conclusions. However, all the information the CAA has taken into account is published on our website/portal.

Scope and Background of the PIR

What is a Post Implementation Review

1. The CAA's approach to decision-making in relation to proposals to approve changes to airspace is explained in its Guidance on the Application of the Airspace Change Process, CAP 1616. This detailed Guidance provides that the seventh and last stage of the process is a review of the implementation of the decision, particularly from an operational perspective, known as a Post Implementation Review (PIR).
2. The Guidance states that the purpose of a PIR *"is for the change sponsor to carry out a rigorous assessment, and the CAA to evaluate, whether the anticipated impacts and benefits in the original proposal and published decision are as expected, and where there are differences, what steps (if any) are required to be taken."*
3. If the impacts are not as predicted, the CAA will require the change sponsor to investigate why, and consider possible mitigations or modifications for impacts that vary from those which were anticipated to meet the terms of the original decision.
4. A PIR is therefore focused on the effects of a particular airspace change proposal. It is not a review of the decision on the airspace change proposal, and neither is it a re-run of the original decision process.

Background to our conclusions in this PIR Decision

5. On 30 November 2018 the CAA approved ACP-2018-05 (Combat Air Training) to adjust the lateral boundaries of the North Sea Danger Areas (EG D323 Complex), introduce 3 new ATS routes and to modify others. In our Decision Letter dated 28 November 2018, we provided factual information and background to the change. We recommend readers of this report read that Decision in conjunction with this document. The Decision Letter can be found at on the CAA's Airspace Change Portal [ACP-2018-05](#).
6. The change became effective on 28 February 2019.

Conditions attached to the CAA's decision to approve the change.

7. The CAA's only condition for approving the change was regarding the provision of data required to conduct this PIR.

Relevant events since change

8. The COVID 19 pandemic, and the resultant travel restrictions, severely impacted the aviation industry in the UK. While the data for this PIR was collected prior to COVID-19, the sponsor's report was produced at a time when industry priorities impacted the available resource and as such limited the amount of readily available data. This has also contributed to a delay in publishing the PIR data on the ACP portal and the writing of this PIR report.
9. Subsequent to the collection of original PIR data, the CAA requested the sponsor update the information regarding safety incidents and delays (para 46-51 in the sponsor's PIR document) and provide an additional environmental assessment of the impact in Feb 2023. This data was then included in the PIR data published on the Airspace Change Portal on the 31 May 2023.
10. Free Route Airspace Deployment 1 ([ACP-2018-11](#)) was implemented on 2 December 2021 and includes part of the EG D323 complex. The original PIR

data for this ACP was collected by the sponsor prior to the implementation of Free Route Airspace Deployment 1. The additional data requested by the CAA in Feb 2023 is post implementation of the Free Route Airspace Deployment 1 and therefore alters the background environment. However, given the improving trend demonstrated by the additional data, this change in background environment has not been considered in the CAA's analysis of the PIR data.

Data collected for the purpose of the PIR

Sources of Information

Change Sponsor

11. By letter of 4 Jan 2021 (See Annex A) the CAA requested from the change sponsor the following data and analysis:
 - a. Safety Data
 - b. Service Provision.
 - c. Airspace Sharing Protocols
 - d. Flexible Use of Airspace (FUA)
 - e. Operational Feedback
 - f. Letters of Agreement
 - g. Impact on MoD Operations
 - h. Confirmation of Requirement

12. The sponsor responded with the data requested above on 7 May 2021 following CAA approval for a 6 week extension. Due to CAA staffing resource challenges and the impact from COVID-19 the sponsor's report was not subject to initial review by the CAA until August 2022. Given the passage of time, it was identified that an update of the Safety Data and Service Provision requirements was appropriate as well as an assessment of the environmental impacts - that

had not originally been provided (CAP 1616 para H8 (2)). The CAA requested further information from the sponsor in February 2023 as follows:

- a. Assessment of the environmental impact.
- b. Update to Safety Data and Service Provision information.

13. The above information was included in an updated report produced by the sponsor which was published on the Airspace Change Portal on 31 May 2023. The CAA has reviewed this material is satisfied that the level of detail is sufficient for the purposes of producing this report.

14. In addition, the following stakeholders were contacted by the change sponsor.

NATS

15. NATS is the air navigation service provider (ANSP) currently providing air traffic control services in the En Route environment around the EG D323 complex and in the airways created and amended as part of this ACP. The change sponsor has actively engaged with NATS to collect and analyse data for this PIR.

Adjacent aerodromes and airlines

16. The sponsor requested feedback from adjacent civilian and military aerodromes and received feedback from Humberside Airport, Teeside International Airport and Eastern Airways.

Other data that we have considered

17. The CAA received feedback from NATS during the 28 period following publication of the report on the Airspace Change Portal.

Objectives and Anticipated Impacts

The original proposal and its objectives

18. The proposal sought to adjust the lateral boundaries of Danger Area complex EG D323 to meet the MoD requirement for larger areas of segregated airspace

needed to accommodate 5th generation fighter aircraft. The proposal included the introduction of 3 new upper air routes and a slight re-route of existing routes UL975 and L602. The proposal also included sharing protocols between NATS and MoD to ensure the needs of the users and network traffic are balanced.

Anticipated Impacts

19. The CAA was satisfied that the proposal would not have any significant impact on:
- a. safety;
 - b. aircraft operators or owners;
 - c. any other person;
 - d. the operational requirements of the MoD or other Air Traffic Service Providers;
 - e. national security or
 - f. international obligations.
20. The CAA was satisfied that the most efficient use of airspace would be secured when balanced between the slight fuel disbenefit when the Conditional Routes were not available and the benefits delivered to training modern UK fast jet aircraft. The airspace sharing protocols, ASM tools and FUA principles would enhance airspace efficiency in this proposal.
21. Regarding environmental impacts, the CAA anticipated an annual increase of fuel burn and CO₂ emissions, resulting from increased track mileage for aircraft routing in/out of the Scottish TMA and southbound overflights when the danger area complex is active with segregated military activity. This was based on 'worst case' data submitted using WebTag.

CAA Assessment

Operational Assessment

Safety

22. The sponsor provided a summary of safety events reported by NATS and the MOD for the 12 month period following the implementation of the airspace change. The safety data provided by the sponsor shows an increase in the number of EG D323 related safety events compared to the 12 months prior to the change. This could indicate that the implementation of this change in airspace design has had a more significant impact on safety than originally anticipated by the CAA. As a result of this trend the MOD instigated a joint civil and military review of safety occurrences which has established collaborative working practices and resulted in several face to face joint civil/military meetings to mitigate the impact of this airspace change.

23. A common theme identified by NATS and the MOD related to the internal segmentation of the EG D323 complex, with the number and complexity of segments causing increased workload and contributing to several of the safety events referenced above. The Joint and Integrated Approach adopted by NATS and the MOD identified this as an area for future review. This review was undertaken by Defence Airspace and Air Traffic Management in Dec 2021 and EG D323 was deemed fit for purpose with any previously identified segmentation issues having been resolved. Feedback provided by NATS during the PIR window suggested that this should be subject to continued review through existing collaborative forums. The CAA confirms that this kind of activity is routine business for the CAA Chaired Airspace Management Steering Group.

24. As a result of the trends identified above, the sponsor was asked to provide additional safety data in the April 2023 update to the PIR document. During this 7 month period a total of 6 safety occurrences were reported by NATS and the MOD, none of which identified the airspace design as a contributory factor.

25. As a result of the above analysis the CAA is satisfied that, because of the mitigations and engagement activity conducted by the sponsor, the airspace change maintains a high standard of safety in the provision of air traffic services. NATS noted the improved safety trends in their feedback provided during the PIR window, stating that this should continue to be reviewed as traffic levels build. The CAA supports this and expects the MOD to continue engaging with NATS as part of the Joint and Integrated Approach.

Operational Feedback

26. Operational feedback was received from entities including NATS, Teeside International Airport, Humberside Airport and Eastern Airways. Those entities that provided feedback for the PIR, as well as others identified by the sponsor, were also informed when it was published on the Airspace Change Portal. The only feedback received during the PIR window was from NATS.
27. The CAA is satisfied with the conclusions made by the sponsor regarding the Operational Feedback. NATS' response during the PIR window also acknowledges the MOD's ongoing work to improve the management of the EG D323 complex during the tactical stage of ASM, including their collaborative work to develop the ASM tools to support its implementation.

Service Provision

28. The original data collected in the 12 months immediately following the implementation of the change shows that military attributable flow restrictions had been implemented on 10 occasions. This had resulted in 6635 minutes of delay relating to the EG D323 complex, compared to only 1071 minutes in the 12 months prior to the change. As a result of this, the CAA requested an update to this data in the April 2023 PIR revision. Following analysis by NATS, it was reported that there was no recorded delay to the en-route network that was associated with the EG D323 complex.
29. Following submission of the latest set of data, the CAA is satisfied that this airspace change has not adversely impacted service provision. It is noted that

routine engagement between NATS, the MOD and the CAA would identify any significant changes to this in the future.

Airspace Sharing Protocols and Flexible Use of Airspace

30. The CAA is satisfied that the airspace sharing protocols, Airspace Management tools and FUA principles enhance the efficiency of the EG D323 complex.
31. The protocols applied in relation to the position of the NAT track (the main flow of transatlantic air traffic) demonstrate effective collaboration between the MOD and NATS and have minimised the impact to en-route aircraft. This is supported by comments received from NATS during the 28 day PIR window.
32. The sponsor referenced some initial issues and inefficiencies with the L3M (Level 3 Airspace Management) cell's management of the EG D323 complex post implementation. While efficiency improved by the end of the initial PIR data period, the level of efficiency demonstrated in the trial that preceded this airspace change was not reached. However, the comparison between pre and post implementation data is limited due to several factors including changes to way efficiency was measured. Overall, based on the data provided by the sponsor, the CAA considers the L3M cell to have had a limited impact on the efficiency of the airspace but notes there is potential for this to significantly improve as NATS and the MOD continue to develop the procedures for tactical management of the airspace, including the more widespread use of LARA (an Airspace Management Tool) by airspace users.
33. It is noted that the sponsor provided evidence in mitigation for the quarterly reviews of airspace sharing protocols not taking place. The CAA is satisfied that the numerous ad-hoc engagements with key stakeholders, as well as the routine conduct of airspace related meetings (such as the Airspace Management Steering Group) sufficiently mitigate the lack of quarterly reviews.

Letters of Agreement

34. The CAA is satisfied that the established Letters of Agreement related to the management of the EG D323 complex are adequate for their purpose, noting

that these are subject to regular review by the CAA and/or MAA as part of routine oversight activities.

Impact on MOD operations

35. The CAA is satisfied that there is an overall positive impact on MOD operations and national security.

Confirmation of Requirement

36. The CAA is satisfied that there is an ongoing need for the changes implemented by this ACP. It is noted that MOD airspace requirements are constantly reviewed to ensure suitability against the ever-changing threats posed to national security.

Environmental Assessment

37. As a Level M2 ACP, the sponsor was only required to assess the anticipated greenhouse gas impacts (expressed in CO₂e) occurring due to the consequential changes to civil aviation patterns caused as a result of aircraft rerouting around the activated danger area complex. The Department for Transport's (DfT) Transport Analysis Guidance (TAG) workbook submitted by the sponsor was based on a modelled worst-case scenario that assumed the activation of the segregated airspace from 0645 to 2015 Mon-Fri, thereby resulting in rerouting of all impacted civil traffic during these hours. The sponsor concluded an increase in annual CO₂e emissions, however, anticipated that this would be partially offset by reduced track distances due to Airspace Management protocols and procedures, tactical routings and when conditional routes and/or FUA principles were applied. The sponsor also anticipated that actual activation hours of the danger area complex would be lower than that assumed in the modelled worst case, further reducing CO₂e impacts.
38. As part of the PIR, the sponsor is required to confirm that the environmental impacts are as anticipated and presented in the approved airspace change proposal (together with any necessary supporting evidence). The sponsor has collated the EG D323 booking data between 1 March to 30 September 2022 from the Military Airspace Management Cell. While the complete 12-month period has

not been presented, the data sample includes the busy summer months and therefore is considered to be adequately representative. The supporting evidence indicates that the actual aviation hours of any EG D323 danger area segment did not exceed the 13.5 hours/day assumed as the worst-case scenario. The sponsor's analysis does not include periods of time during civil suppression requests and tactical hand back of airspace by the Level 3 Management Cell which would also further reduce the actual environmental impacts.

39. Not all the assumptions made in the original assessment can be validated as the sponsor has not presented additional data such as the number and types of aircraft actually impacted, or recalculated the actual CO₂e emissions impact and TAG. The CAA concludes that the actual environmental impact in terms of CO₂e emissions is negative as predicted and that actual activation hours were lower than the modelled worst case scenario as evidenced, however, its scale and magnitude cannot be definitively ascertained.

Community Stakeholder observations

40. As part of the data collection process, the Change Sponsor accepted and processed community feedback arising from the Airspace Change and prepared an analysis of that information for the purposes of this review. The sponsor received feedback from NATS, Teeside International Airport, Humberside Airport and Eastern Airways.
41. The sponsor worked closely with NATS in the production of the PIR and their feedback has been referenced throughout this report when appropriate. The CAA is satisfied with the sponsor's PIR conclusions on the feedback received from the other community stakeholders.
42. We also took into account the feedback submitted by NATS during the 28 day feedback period which has been referenced in this report at relevant sections. This was the only feedback submitted during the 28 day period.

Any other impacts

43. No other unanticipated impacts have been identified.

Conclusion

44. The CAA is satisfied that the changes implemented by this ACP have achieved the aims and objectives with overall impacts being no worse than originally anticipated. The CAA notes that further improvements in the tactical management (L3M cell) of the EG D323 complex are possible through ongoing engagement between the sponsor and stakeholders in existing collaborative forums.

45. Therefore we can confirm that the design satisfactorily achieves the objective and terms of the CAA's decision, and the change is confirmed.

Note on plain language

46. The CAA has attempted to write this report as clearly as possible. Our approach has been to include all the relevant technical material but also to provide a summary and of the conclusions the CAA has reached in reliance on it in as understandable a way as possible. Nevertheless, when summarising a technical subject there is always a risk that explaining it in more accessible terms can alter the meaning.

Civil Aviation Authority

[date]

Annex A – Combat Air Training PIR Data Request Letter



Safety and Airspace Regulation Group

04 January 2021

Our Ref: ACP 2018-05

Combat Air Training Airspace Post Implementation Review Requirements

General

1. On 28 February 2019 the Combat Air Training Airspace came into effect. The proposal adjusted the lateral boundaries of EG D323 to meet the requirement for larger areas of segregated airspace to accommodate the training requirements with the introduction of 5th generation combat aircraft. To achieve this the proposal introduced 3 new routes (N44, N66 and N110) and re-routed UL975 and UL602. In addition, the military's UK Airborne Early Warning Area (AEW) Orbit Area 4 was disestablished, and a new lobe added to AEW Area 5, and the military high-level tanker refueler route was moved into the new EG D323 complex.
2. In accordance with Stage 7 of CAP 1616, the CAA is required to review how the airspace change has performed, including whether anticipated impacts and benefits in the decision have been delivered. The CAA is therefore commencing a Post Implementation Review (PIR) for the Combat Air Training Airspace ACP.
3. The purpose of the review is for the change sponsor to carry out a rigorous assessment, and the CAA to evaluate, whether the anticipated impacts and benefits in the original proposal and published decision are as expected, and where there are differences, what steps (if any) are required to be taken. The post-implementation review is not a review of the decision on the airspace change proposal, and neither is it a re-run of the original decision process. The change sponsor must prepare a detailed analysis of how these impacts compare with what was set out in the airspace change proposal and accompanying options appraisal upon which stakeholders were consulted. This is to demonstrate how the airspace change has performed in relation to the original Statement of Need, design principles and options appraisal.
4. The change sponsor publishes its review analysis and documentation on the online portal, and the CAA invites stakeholders to submit their own observations. Once the change sponsor's data submission is published on the portal, there will be a 28-day window during which any stakeholder may provide feedback on the data which the CAA will take into account when carrying out its review about whether the impacts of the change are those expected, 12+ months on. If the impacts are not as predicted, the CAA will require the change sponsor to investigate why, so the CAA can determine whether further action is needed to change the airspace structure or to revise flight procedures to meet the terms of the original decision.

5. Any data provided to the CAA as part of the PIR assessment must, if possible, be in a format that is consistent with, and comparable to, data provided as part of the original consultation and formal ACP.

Post Implementation Review Data Requirements

6. The following data is required to facilitate the PIR:
- a. Safety Data: Any instances of incursion/excursion of the danger areas. Reports of any MORs, AIRPROX or Air Safety Reports.
 - b. Service Provision: Any instances of refusals of service, denied access, air traffic delays (including those caused by unused airspace not handed back/released, or by late/not notified activation of a danger area), unavailability of a danger area crossing service or danger area activity information service.
 - c. Airspace Sharing Protocols: detail and application of the airspace sharing protocols, and evidence that the quarterly reviews have been performed by MoD with relevant aviation stakeholders. Any issues deconflicting serials in Areas F to K with the tactical high-level refueler route. Activation times have complied with the airspace sharing protocols, including confirmation EG D323 has not been activated at weekends or on Public Holidays.
 - d. Flexible Use of Airspace (FUA): The application of FUA and Airspace Management Tools including the progress of the wider adoption of LARA and uptake of its enhanced application, and the provision and effectiveness of the Level 3 (Tactical) Airspace Management Cell at RAF(U) Swanwick, including occasions this was not available. A report on the availability and uptake of the Reduced Co-ordination Area which facilitates civil traffic to safely undertake tactical shortcuts through the airspace when available. Evidence of 'level sensitive bookings'.
 - e. Operational Feedback: Any feedback received from aviation stakeholders operating in, or affected by, the revised airspace design, including, but not limited to, airlines, adjacent ANSPs and air traffic controllers; and those impacted by the airspace sharing protocols including, but not limited to, the Airspace Management Cell.
 - f. Letters of Agreement (LoAs): confirmation that LoAs are in place and utilised correctly and have the desired effect.
 - g. Impact on MoD Operations: confirmation that there are no unforeseen impacts on MoD operations.
 - h. Confirmation of Requirement: the CAA note that the MoD have submitted ACP-2020-026 'Future Combat Airspace for Military Training'. The Statement of Need concludes that "*Changing external circumstances make current solutions untenable to deliver the required needs of Defence. Alternate airspace would diminish required training objectives for Defence and increase the risk to all air users to an unpalatable level*". This statement infers that the MoD viewpoint is that ACP-2018-05, the subject of this PIR, did not achieve the required aims for the MoD and that a new ACP to rectify this has been submitted. Confirmation and a detailed

explanation is required from the MoD whether in their opinion ACP-2018-05 has met its aims and objectives; if so why another ACP of similar name and requirement has been submitted, and if not to confirm they wish to revert this ACP to the airspace structure prior to the change and focus on achieving their requirements in ACP-2020-026.

7. If certain data is unavailable or is disproportionately burdensome to provide, the CAA will consider representations from MoD explaining the reasons for not providing the data and the CAA may adjust the requirements on this basis.

8. Any other data that would provide evidence of other benefits or impacts as a result of the airspace change should also be included in an appropriate format.

Submission to the CAA

9. The above data must be provided within 12 weeks of the date of this letter. An extension to this period may be granted by the CAA upon request with appropriate reasons.

Civil Aviation Authority
04 January 2021