MOD Future Air Combat Airspace Trials

Wider ATM trial criteria and considerations

Introduction

This document specifies the considerations and criteria that NATS considers the MOD must capture within their proposed Future Air Combat Airspace Trial 2020/2021 (which is proposed to support a FAC ACP).

The magnitude of change proposed by the MOD in the trial will have significant impact on NATS, wider UK airspace users and ATM stakeholders. Whilst the trial is proposed in support of Military training and operations, the CAP1616 process requires engagement to be undertaken by the MOD to understand and mitigate the impact to other stakeholders. NATS has engaged early with the MOD (the ACP sponsor, 92 Sqn, and the Defence Airspace and ATM team (DAATM)) to identify and provide feedback to the Military community to help them create a full trial plan which considers these aspects and the future changes to UK ATM anticipated over the next few years.

Alignment

It is vital that the trial understands the impact on the current UK and European framework and operational network. It must also understand, and not undermine, current and planned change programmes. This is especially important in the current and post COVID-19 pandemic aviation regeneration activities.

The following alignment considerations are highlighted for inclusion in the trial:

CAP670

CAP670 is the Civil Aviation Publication relating to Air Traffic Services Safety Requirements. Due to the significant impact of the MOD trial, specific consideration (and compliance) to Part B, Section 4: GEN 03: Safety Requirements for Operational Trials in Air Traffic Services must be captured in the MOD trial plan.

UK Airspace Modernisation Strategy

The airspace modernisation strategy (CAP1711) sets out the UK initiatives that will deliver a fit for purpose ATM environment and airspace for all users. Changes proposed in the MOD trial impact several of these initiatives and so must measure and consider the level of impact and align, as best it can, to the UK state ATM developments. This includes the implementation of Free Route Airspace and Systemised Airspace.

The development and management of UK FUA and Airspace Management (ASM) is captured in the AMS, primarily in the Advanced Flexible Use of Airspace (AFUA) initiative. This initiative is managed by the FUA State Programme which has a recognised and agreed delivery and performance improvement plan.

FUA State Programme (FSP)

The FUA state programme is an AMS groups whose members include the CAA, MOD and NATS as well as representation from other stakeholder groups such as the Airline industry. The FSP is responsible for delivering initiatives under the AMS including FRA and AFUA.

The FSP goals are to drive change that:

- Improves airspace utilisation
- Enhances ASM processes, protocols and rules
- Establishes common ASM tools used by all stakeholders for all phases of planning and delivering ATM operations
- Establishes a modular and flexible airspace design
- Implements an integrated ASM system with UK and European airspace and flow capacity management and ATC systems

The proposed trial should seek opportunities to develop and understand what is required to meet these objectives and capture them within its scope. The MOD trial should also align to the agreed plan mentioned above.

Future proofing & Cost management

Changes to UK airspace design are costly and time consuming. The amount of change associated with the trials should be kept to the minimum possible to enable a successful trial. Change should also be enduring where possible and compliment on-going and planned changes to the UK and ATM infrastructure. That is, there should be little or no change where possible that creates excessive cost for any subsequent removal, either at the end of the trial period or in order to implement AMS initiatives.

Criteria to be considered and captured in MOD trial

Objectives

The primary objective of the trial is to provide input for a permanent MOD ACP to establish a permanent airspace design for Collective Training. In this respect it is to test airspace designs and airspace management procedures that enable collective training for large force exercises. Outside of this primary objective MOD must also consider, design and test other airspace (temporary or permanent) structures that would mitigate the impact on other airspace users and service providers and mitigate safety risks. (ATS routes or Controlled airspace for example).

In order to align with AMS (AFUA), understand and minimise the impacts on the wider airspace user and stakeholder community, NATS expects the following trial objectives to be captured within the MOD trial for completeness:

- Identify and enhance safety mitigation
- Identify formal FUA processes to ensure safe and efficient management of SUA and the ATM network
- Deliver a predictable and flight plannable airspace conforming to UK Policy and Network Manager requirements

- Assess, identify and mitigate impact on wider ATM stakeholder flight planning, fuel planning and flight time
- Assess, identify and mitigate impact on the environment and flight efficiency, including fuel burn, CO_2 and noise
- Assess, identify and mitigate impact on Network capacity and management
- Assess, identify and mitigate impact on Operational delivery to enhance operational procedures and reduce manpower requirements for exercise periods
- Optimise planning and notification processes including assessing the requirement for/benefit of appropriate ASM systems and tools
- Assess and, where possible, reduce activation times of exercise and other segregated airspace for exercise periods to deliver enhanced ASM processes in line with UK Policy and strategy (minimise the cumulative effect of simultaneous Danger Area activations)
- Identify technical system changes required for ASM and ATC
- Assess airspace utilisation relating to MOD exercise activity (civil and military)

Targeted benefits

- Delivering UK ASM and FUA Strategy
- Efficiency - Improved ASM processes and protocols
- Efficiency – reduction in manpower effort (planning and operational delivery)
- Safety improvements for ASM and operations

Success criteria

- ASM protocols defined and agreed under LoA
- Overall Airspace design identified and fit for purpose (including further CAS, ATS routes and airspace structures that may be required to minimise impact of exercise airspace)
- Flight planning management and re-route scenarios defined
- Operational procedures and MOps defined and agreed
- Enhanced Safety mitigations in place
- Wider ATM impacts understood and mitigated
- Reduction in dedicated manpower resources to manage collective training

Trial Entry & Exit Criteria

The following trial criteria must be complete in order to manage the MOD trial

Trial Entry Criteria

- Airspace design approved and adapted into UK and European ATM and Flight planning systems where required
- AMC impact assessment complete
- Safety Assessments complete and mitigation agreed
- ASM protocols agreed – deconflicted SUA airspace activations to minimise any cumulative negative impact on network (e.g. conflicts between east coast and west danger area complexes)
- Appropriate staffing plan for required areas e.g. ACM, AMC and MABCC to be available to produce the Airspace Plan and any subsequent updates, Military ATC provision for ingress/egress of exercise traffic
- ATC Procedures and MOps defined
- CAA approval

- Reversion / cessation process agreed

Trial (and Trial stage) management and Exit Criteria

In order to gain useful insight from the trial a continual an iterative feedback process should be established. For example, 'hot debriefs' after each activation and full review after each stage. Trial debrief representation from NATS Ops, ACM and ASM included. Suggested key areas to cover for debriefs:

- Safety observations
- ATC Ops observations
- ASM/ACM observations

A full post trial review will be required with relevant stakeholders, including NATS. A full trial report covering agreed objectives and measurements will also be required to exit the trial.

Trial reversion

If for any reason it is deemed necessary to suspend the trial, either on a temporary basis or cancel it completely, MOD must inform NATS at the earliest opportunity so that resources can be refocussed so not to incur unnecessary costs. This will also allow adequate time to re-plan activities with other change programmes and AIRAC activities (especially in relation to changing date)

Mechanisms and agreements should be put in place should the trial need to be curtailed, suspended or brought to an end for any reason and to limit activities required to successfully revert to the previous state.

Measurements

	Objective	Measurement
1	Identify and enhance safety mitigation	Safety Assessments will have been completed and trial will conform to safety elements of CAP740, the CAA Buffer Zone Policy for Special use areas and the establishment of Temporary Danger Areas (if required). Safety barriers will be established to reduce risk to ALARP and in particular to minimise the risk of MAC. Coordination procedures and positive control for participating aircraft entering and leaving the trial airspace (ingress/egress/during activation) will have been agreed and mitigating airspace structures (for example: Flight Plan Buffer Zones (FBZ), Temporary/Flexible Controlled Airspace (CAS)) will be introduced where appropriate).
2	Identify formal FUA processes to ensure safe and efficient management of SUA and the ATM network	Management of the airspace will conform to the Eurocontrol specification for the application of FUA, European ASM handbook and CAP740 UK ASM Policy. Timing of trial airspace will be coordinated and planned with NATS through AMC and ACM processes pre-tactically with efficient tactical management during times of operation. Deconfliction with other segregated activities will have been addresses and ASM protocols agreed (for example limit activities to EGD323/613/712/701 complexes and Joint warrior airspace)

3	Deliver a predictable and flight plannable airspace conforming to UK Policy and Network Manager requirements	Recognised processes for ensuring that network flight planning will have been introduced where required including updates to the AIP, Eurocontrol systems (tested) and ATM system adaptation (including the UK Fight Data Processor). Predictability will have been achieved by timely notification of change to airspace users and network managers of design and activations through recognised means including the UK Airspace Utilisation Plan.
4	Assess, identify and mitigate impact on wider ATM stakeholder flight planning, fuel planning and flight time	Engagement with stakeholders and airspace users will have been completed to gather feedback and analytical data will be compiled, reviewed and reported to demonstrate positive and negative effects.
5	Assess, identify and mitigate impact on the environment, including fuel burn, CO_2 and noise	Analytical data will be compiled, reviewed and reported to demonstrate positive negative environmental effects on stakeholders and airspace users comparing current and trial airspace configurations aiming to reduce any negative impacts to a minimum.
6	Assess, identify and mitigate impact on Network capacity and management	Analytical data will be compiled, reviewed and reported to demonstrate positive and negative effects on stakeholders and airspace users comparing current and trial airspace configurations. This will include Short term air traffic flow capacity management (STAM) and possible/actual regulation of air traffic which will reduce to a minimum any negative impacts.
7	Assess, identify and mitigate impact on Operational delivery to enhance operational procedures and reduce manpower requirements for exercise periods	The impact on resource for operational delivery of the required airspace and its management will have been assessed and staffing rostered. Legacy procedures and excessive staff resource for collective training will have been reduced to the minimum to deliver a safe and efficient outcome.
8	Optimise planning and notification process including the requirement for/benefit of appropriate ASM systems and tools	The UK AMC will have established and agreed processes and utilise the UK Airspace Management Tool (LARA) to provide transparent visibility of planned activities and airspace status. Benefits of common collaborative tools will have been identified and follow up activity agreed,
9	Assess and, where possible, reduce activation times of exercise and other segregated airspace for exercised periods to deliver enhanced ASM processes in line with UK Policy and strategy	Activation of collective training airspace will have been reduced to the minimum time required to achieve the mission in line with FUA and ASM policy through improved collaborative planning activities, ASM and route management. Protocols for the management simultaneous activations of east and west coast SUA will be agreed.
10	Identify technical system changes required for ASM and ATC	Changes to systems will have been identified and implemented where required to facilitate the safe and efficient management of the trial airspace
11	Assess airspace utilisation relating to MOD exercise activity	Utilisation of airspace will be measured during the trial to assess and report how efficiently the trial airspace was used. Civil use of network airspace will also be analysed and reported to provide a complete picture of how efficient the airspace trial was and where enhancements could be made through either airspace and/or procedure developments.