

Safety

Increasing safety barriers and decreasing and managing risk are central to our Trial Proposal, especially since there were safety concerns raised about the previous exercise airspace solution.

Large-scale military flying training is an inherently risky activity; therefore the airspace (as a critical enabling function) needs to be as safe as possible in its design and management in order to minimise risk in other areas.

All activity inside the Trial Airspace will be carried out under existing MoD rules and procedures for use of MDAs. This is normal daily business. However it is where military and civil traffic could encounter each other around the edges of the Trial Airspace where our attention has been devoted in the creation of this Trial proposal. These are the sorts of issues addressed in this Annex.

As well as the Engagement Strategy to understand the concerns of external stakeholders (at **Annex D**), the Trial Sponsor ran an internal MoD Safety Assessment Panel (SAP) made up of Suitably Qualified and Experienced Personnel (SQEP) to identify, discuss and mitigate any safety concerns about the Trial. The endorsed output of that meeting is at **Appendix 1**. There is some inevitable duplication between the external and internal stakeholder points.

This table provides a consolidated set of responses to our external Engagement Strategy and addresses stakeholder concerns with the required mitigation:

Originator	Issue	Risk	Mitigation
NATS	Lateral dimensions of Stage 1 do not conform to CAA <i>Special Use Airspace – Safety Buffer Policy for Airspace Design Purposes</i> in the Newcastle area.	Aircraft performing high-energy manoeuvres within 5nm of Newcastle CTZ between FL85 and FL105 will be in violation of the CAA policy.	This affects Trial Stage 1 only. Although it is unlikely that high-energy manoeuvres would take place at the very edge of the airspace, ASWC will add a 5nm buffer in the Exercise Airspace Control Order (ACO) and Exercise Airspace Control Plan (ACP) around the Newcastle CTZ between FL85 and FL155 for fast-jet aircraft

			only. This will be briefed to all exercise participants.
NATS	Inadvertent airspace incursion. Due to the short timeframe to run the Trial Stage 1 during CRIMSON WARRIOR, there is no ability to modify the European Network Manager flight plan acceptance protocols and thus prevent operators from filing flight plans that will result in GAT cross the area below FL245 (Class G airspace) during periods of activation.	<p>Civil traffic could unwittingly flight plan and fly into the Trial airspace below FL245 off a recognised route and could potentially come into conflict with military exercise traffic.</p> <p>Airline operators could file a route to fly through Class G airspace between ADN and NATEB.</p>	<p>This affects Trial Stage 1 only.</p> <p>Civil operators should be aware of the Trial airspace activation (TDA) because of the notification in the AIC and then NOTAM activation at D-1.</p> <p>OC MABCC will suppress the P18 airway for the duration of the airspace activations in Stage 1. This is normal business during MoD exercises.</p> <p>Engagement will take place with affected airline operators (e.g. Eastern Airways) ensure they are aware of the military exercise and flight plan to avoid. This engagement and CoA has taken place successfully during previous military exercises.</p> <p>Radar will be monitored to identify any potential aircraft incursion to the Trial Airspace.</p>
MoD	Inadvertent airspace incursion.	General Aviation airspace users could operate or inadvertently penetrate the Trial airspace.	<p>Airspace users should be aware of the Trial airspace activation (TDA) because of the notification in the AIC and then NOTAM activation at D-1.</p> <p>Continued engagement (through the GAA and BGA) will take place with General Aviation airspace users to ensure they are aware of the military exercise and plan to avoid.</p> <p>The Base level of the airspace is FL85 which minimises the likelihood of incursion by the majority of GA.</p>

			Radar will be monitored to identify any potential aircraft incursion to the Trial Airspace.
NATS	There is a small section of the Flamborough CTA overland below 7000ft AGL. This would normally potentially require a noise assessment as part of an ACP.	Nil	The proposed introduction within the trial period of temporary CAS is intended to ensure the safety of aircraft and does not therefore constitute a Planned Permanent Redistribution (PPR) of traffic. Furthermore, the construct of this airspace is primarily designed to allow aircraft to remain over the sea until inception with the ILS for the predominant runway (25).
NATS	<p>Uncoordinated excursion from the Trial Airspace above FL245.</p> <p>This is a major concern for both NATS and MoD, particularly for Stage 1 where the Trial Airspace is smaller and the full adaptation of the available route structure will not be complete due to COVID-19 impact and short timelines.</p> <p>For Stage 1 in particular, there will be a requirement for exercise traffic to leave and re-enter the Trial Airspace, especially in the areas of Leuchars, Northumberland and the eastern edge of the airspace. This is will be less of an issue at Stage 2, where the airspace dimensions are much bigger and therefore there's less of a requirement to fly outside it during the mission.</p>	Civil traffic routing around the Trial Airspace could come into conflict with uncoordinated exercise traffic.	<p>Military exercise traffic must not leave the Trial Airspace above FL245 without permission from military controller, who should coordinate the excursion with the relevant civil sector.</p> <p>In mission design, ASWC will attempt to make sure that all planned airspace excursions by tactical aircraft will be below FL245. This can be done through the allocation of altitude blocks in mission planning and 'cuffing' Red Air operating altitudes to minimise the chance of excursion above FL245.</p> <p>ASACS Weapons Controllers will 'in-brief' before each mission, including contact details of the relevant civil sector controllers for immediate phone contact for coordination.</p>

			<p>The LOA at Ref B is an additional mitigation here: Annex A details exactly how military / civil coordination will happen in the vicinity of the MDAs. Since the trial airspace will have TDA status, the LOA will apply.</p> <p>ASWC will ensure that all Ex participants are aware of the sensitivities of the airspace on a daily bespoke briefing; NATS have made it clear that an uncoordinated excursion >FL245 which leads to a confliction with civil traffic will be a 'red line' for them and could lead to a recommendation of Trial reversion.</p> <p>ASWC will consider a punitive response to an uncoordinated airspace excursion, such as immediate recall and/or expulsion from the Exercise.</p>
NATS	<p>Uncoordinated excursion from the Trial Airspace below FL245.</p> <p>This is a concern for NATS for Stage 1 especially, where the airspace is smaller and the full suppression of airways and conditional routes below FL245 will not be achieved.</p>	<p>Civil traffic routing around the edges or underneath the Trial Airspace could come into confliction with uncoordinated exercise traffic.</p>	<p>Military exercise traffic should not leave the Trial Airspace below FL245 without traffic information provided by a tactical controller or RAF(U) Swanwick, especially in IFR conditions.</p> <p>The P18 airway between Newcastle and Aberdeen will also be suppressed during activation of the airspace. This will reduce the likelihood of civil traffic trying to transit through the airspace.</p>

USAFE	USAF refuelling flights (REFUELLER) have Non-Deviating Status (NDS) through the western edge of the Stage 1 and 2 Trial airspace (Northumberland). Re-routing options are limited due to the proximity of the airways structure and the MTMA and ScTMA to the south and west.	REFUELLER flights would require tactical, non-standard management which could have an impact on other airspace users. There may not be a viable route for REFUELLER flights through the airspace.	For Stages 1 and 2, deconfliction will be required between USAFE and MoD to try to avoid a REFUELLER flight operating transiting the area during the Trial airspace activation. USAFE have already been engaged on this issue. Longer term there may be an option to re-route the REFUELLER flights.
Aberdeen Airport	Inbound and outbound traffic will have to route via P600 rather than the P18.	This could incur a routing penalty of up to 50nm and possible noise impact below 7000ft AGL overland.	We believe that the number of flights affected by the Trial Airspace will be low, but the trial will provide useful data on this point.
Aberdeen Airport	If the Trial Airspace is a success, MoD users could try to activate it for more than the anticipated baseline of (approx.) 30 missions / 100 hours per year.	If the airspace usage creeps up, then the corresponding impact on Aberdeen traffic will increase by a corresponding amount.	The trial sponsor is aware of the 'dangers of success' of this Trial in terms of increased demand. This is an issue for the future – the future engagement for ACP-2020-026 (permanent solution) will address this issue further.
British Gliding Association (representing Borders Gliding Club)	Both Stages of the Trial have airspace covering Millfield and surrounds down to FL85.	Borders Gliding Club (and other nearby clubs) will be severely impacted by the activation of a TDA above their site. The freedom which it currently enjoys to fly unrestricted (by NOTAM) in mountain wave conditions up to FL195 (FL240 at weekends) in the TRA(G)s will be denied.	One of the Trial aims is to improve the notification to the whole aviation community of high-intensity military exercise flying. Ideally the exercise airspace would extend down to the surface to offer full freedom and protection for military exercise traffic. MoD acknowledge that this is unrealistic because it denies any access to other airspace users. Hence the base level of the Trial Airspace of FL85. Measurement of suitability of the Trial Airspace

			<p>dimensions is one of the Trial objectives.</p> <p>Planning a notified TDA structure allows more protection to all airspace users reducing the MAC risk.</p> <p>Beyond the Trial, the eventual activation of the permanent airspace will be intermittent – with a nominal baseline of 30 activations / 100 hours a year. This is approx.. 2% of the available daylight hours in a year.</p> <p>It should be noted that during TDA activation, military traffic including fast-jets may be flying in the lower air between 250' and FL85.</p>
British Gliding Association (representing Borders Gliding Club)	During Stage 1 of the trial, two of the dates - 19 and 21 Oct 20 (active between 0900 and 1200 hrs) - fall within a planned flying week (described by the Borders gliding club as Wave Week 3).	<p>On these dates, Borders gliding club would be limited to operating up to FL80, which is a significant operational limitation.</p> <p>The TDA does not propose to prevent access to the entirety of the TRA (G) during Stage 1.</p>	<p>The Trial Sponsor would be glad to nominate a liaison officer to discuss and deconflict Trial airspace activation with Borders Gliding Club for their Wave Week during Stage 1.</p> <p>Ongoing engagement will occur between MoD and the BGA/Borders Gliding Club to understand the requirements of both users, identify and mitigate any potential risks and explore options for enabling both parties activities to continue safely, with minimal impact.</p> <p>It should be noted that during TDA activation, military traffic including fast-jets may be flying in the lower air between 250' and FL85.</p>

17 Jul 20

ACP 2020-042 MoD Airspace Users Safety Assessment Panel

References

- A. 20170526-Legacy CACA Safety Assessment-O
- B. 20200716-Letter of Agreement Between NATS and MoD, dated 1 Mar 2018

Introduction

1. On 17 Jul 20, the RAF Air & Space Warfare Centre (ASWC) as trial sponsor for ACP-2020-042 convened a Safety Assessment Panel (SAP) comprising of MoD airspace stakeholders to review the trial proposal and identify issues, risks and mitigations. This document is the output of that work and will feed into the trial proposal submitted to the CAA on 31 Jul 20.

Participants

2. The SAP was correctly constituted as follows:

<i>Name</i>	<i>Role</i>	<i>Organisation</i>	
Wing Commander Lewis Cunningham	OC 92 Sqn	ASWC	Chairman
Mr Craige Curry	Inzpire Ltd	ASWC	
Squadron Leader Ali McConnachie	Airspace Plans	DAATM	
Lieutenant Commander Kev McMorrow	OC 3 Sqn	Swanwick Military	
Flight Lieutenant Gavin Leitch	Dep OC 2 Sqn	Swanwick Military	
Flight Lieutenant Kirsty Thompson	OC MABCC	Swanwick Military	
Squadron Leader Nayfe Christopher	ASACS A3/5	Space&BM Force HQ	
Squadron Leader Sam Kelly	Area A3/5	Space&BM Force HQ	
Squadron Leader Andy Pollard	Safety	Space&BM Force HQ	
Flight Lieutenant Lisa Mitchell	Safety	Space&BM Force HQ	
Flight Lieutenant Mike Burley	OC Tactics	ASACS OCU	
Flight Lieutenant Craig Neal	OC STANEVAL	E-3D Force	

SAP Agenda

3. The following agenda items were covered during the SAP:
- a. **Context.** MoD enduring requirement for suitable airspace to hold large-scale exercises. The origins of the CACA. Shortcomings of the CACA (at Ref A.) Requirement to make the CACA safer. Initiation of the ACP to address these safety and design issues for the CACA and to investigate better airspace to feed into a permanent ACP. The significance of Ex CRIMSON WARRIOR.
 - b. **Review of ACP 2020-042.** Introduction and detailed explanation of the 2 trial Stages, centring around physical dimensions, airspace management and air traffic management. Aims and objectives of the trial. Explanation of the differences between the CACA and the trial Stage 1 airspace design.

- c. **Identification and Discussion of Issues, Risks and Mitigations.** The findings of this part of the meeting are presented below. Each mitigation will be considered and incorporated into either the Trial Proposal document or into internal MoD processes during the planning and execution of the trial. The findings are below.
- d. **Response to NATS concerns.** In early bilateral engagement sessions, NATS identified a series of issues they needed to be addressed; namely uncoordinated excursion >FL245, update to mission systems and the proximity of the trial airspace to Newcastle. Each of these issues was discussed and addressed in the tables at Annex A.
- e. **Next Steps and Contingency Planning.** Trial timelines between present and Ex CRIMSON WARRIOR. Milestones and decision points which have to be met. Internal MoD messaging on the importance of this trial.

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ACP 2020-042 MoD Airspace Users Safety Assessment Panel

Dated 17 Jul 20

Issues, Risks and Mitigations Identified for ACP-2020-042

1. Military Airspace Users Familiarity with Trial Airspace	
Issue	The Trial Airspace in both Stages 1 and 2 is of a new design and therefore will be unfamiliar to military users. Because the Stage 1 airspace has the same lateral dimensions as the CACA, there is an additional possibility of confusion between them.
Risk	Unfamiliarity with the trial airspace could lead to: <i>Uncoordinated excursion due to unawareness of airspace boundaries</i> <i>Incorrect ATS service provided (controllers)</i> <i>Incorrect separation and coordination applied (controllers)</i> <i>Incorrect assessment of status of airspace occupied (aircrew)</i>
Mitigation	<p>Accurate and timely notification of the airspace dimensions and status via the AIRAC cycle and the Supplementary AIP.</p> <p>All military users (controllers and aircrew) to perform a double check that their mission systems are loaded correctly and are displaying the correct information from the AIP for the trial and not any legacy CACA material (which would look superficially similar).</p> <p>Mapping for military airspace users should show the surrounding airspace structures both above and below FL 245 (En-Route High and Low charts) to reinforce the point that there are airways in close proximity to the trial airspace.</p> <p>Briefing at the start of Ex CRIMSON WARRIOR for all Ex participants on the structure of the trial airspace, the differences from the CACA (which some may have used previously) and the particular areas where airspace excursion may be more likely (Newcastle CTZ, Northumberland >FL245, Leuchars area).</p>

2. Airspace Notification to Non-Exercise Military Traffic	
Issue	Military non-exercise traffic may not be aware of the airspace trial (or Ex CRIMSON WARRIOR) and try to transit through it or request ASACS tactical control elsewhere in the UK.
Risk	<i>Non-exercise traffic may not achieve mission objectives</i>

Mitigation	<p>Notification via the Gp Senior Air Staff Officers (SASOs) that Ex CRIMSON WARRIOR is happening (dates, times, locations) and that both tactical control and access to the trial airspace area may not be possible.</p> <p>Ex CRIMSON WARRIOR is the biggest live collective training exercise in the UK this year, involving almost all military aircraft fleets. Therefore the chance of a Squadron or Force not knowing anything about it is in reality quite low.</p>
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3. Confliction with USAFE REFUELLER Missions	
Issue	USAF AAR aircraft providing fuel to USAF aircraft transiting UK airspace are granted non-deviating status in a block (normally FL260-280) on a set route which passes through the trial airspace at Stages 1 and 2 and the proposed Future Combat Airspace. (Per NATS / MoD LOA dated Mar 2018)
Risk	<i>Refuelling flight conflicting with activation of trial airspace leaves little physical space for deviation and would breach the terms of the LoA.</i>
Mitigation	<p>For Stages 1 and 2 of the trial, the best answer is early active deconfliction of refuelling flights from trial airspace activation periods. This will be led by the Trial Sponsor in conjunction with USAFE.</p> <p>Additional mitigation is provided by MABCC checking at D-1 that there is no REFUELLER flight programmed for airspace activation periods.</p> <p>For future activations of the airspace, a new routing and set of procedures will probably be required. This requirement will be assessed as part of the trial output.</p>

4. Handling of Exercise Traffic Leaving Trial Airspace Below FL245	
Issue	The whole reason behind this trial is to create airspace activated intermittently and suitable for large-scale military collective training. Stage 2 will introduce and test this airspace, which should remove any requirement to leave and re-enter the airspace during the mission. However the Stage 1 airspace will require excursion, especially east of Leuchars (Red Air 'regeneration' and holding) and in Northumberland (simulated targets and threat systems).
Risk	<i>Military traffic leaving the trial airspace below FL245 should be coordinated against civil traffic and provided with a suitable ATS for the duration of their excursion.</i>
Mitigation	Notification of the airspace activation will be by NOTAM and therefore all airspace users should be aware of it. However, in Class G airspace below

	<p>FL245, there is a chance of interaction between civil and military traffic around the fringes of the trial airspace. Military controllers (ASACS or E-3D) as well as exercise safety staff will need to be aware of this.</p> <p>The trial sponsor will arrange a discussion with NATS to present some vignettes of whereabouts these excursions are likely to happen, what the military traffic will be doing and how any required coordination could be managed.</p> <p>The P18 airway between Newcastle and Aberdeen will also be suppressed during activation of the airspace. This will reduce the likelihood of civil traffic trying to transit through the airspace.</p>
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5. Handling of Exercise Traffic Leaving Trial Airspace Above FL245	
Issue	<p>The whole reason behind this trail is to create airspace suitable for large-scale military collective training. That includes ‘tactical admin’ – holding, refuelling, marshalling- as well as fighting. Stage 2 will introduce and test this airspace, which should remove any requirement to leave and re-enter the airspace during the mission. However the Stage 1 airspace will require excursion, especially east of Leuchars (Red Air ‘regeneration’ and holding) and in Northumberland (simulated targets and threat systems). There will also be air-air refuelling and Intelligence Surveillance and Reconnaissance aircraft involved in the mission but flying outside the trial airspace throughout in pre-coordinated altitude blocks.</p>
Risk	<p><i>Military traffic leaving the trial airspace above FL245 must be coordinated against civil traffic and provided with a suitable ATS for the duration of their excursion.</i></p>
Mitigation	<p>In mission design, ASWC will attempt to make sure that all planned airspace excursions will be below FL245. This can be done through the allocation of altitude blocks in mission planning and ‘cuffing’ Red Air operating altitudes to minimise the chance of excursion above FL245.</p> <p>ASACS Weapons Controllers will ‘in-brief’ before each mission, including contact details of the relevant civil sector controllers for immediate phone contact for coordination.</p> <p>The LOA at Ref B is an additional mitigation here: Annex A details exactly how military / civil coordination will happen in the vicinity of the MDAs. Since the trial airspace will have TDA status, the LOA will apply.</p> <p>ASWC will ensure that all Ex participants are aware of the sensitivities of the airspace; NATS have made it clear that an uncoordinated excursion >FL245 which leads to a confliction with civil traffic will be a ‘red line’ for them.</p> <p>ASWC will consider a punitive response to an uncoordinated airspace excursion, such as immediate recall and/or expulsion from the Exercise.</p> <p>The P18 airway between Newcastle and Aberdeen will also be suppressed during activation of the airspace. This will reduce the likelihood of civil traffic trying to transit through the airspace.</p>

5. E-3D Coordination with Civil ATC Agencies	
Issue	The E-3D has no direct communications with ground ATC agencies.
Risk	<i>Coordination between E-3D and Swanwick Mil is not possible, leading to expanded separation criteria applied by E-3D controllers and few options in case of unexpected interaction between mil and civil traffic.</i>
Mitigation	<p>This limitation is not specific to this airspace trial and is well understood when the E-3D is controlling military aircraft activities. Options for ASACS to coordinate on behalf of the E-3D have been discounted.</p> <p>The E-3D will have to apply standard separation criteria for military traffic against civil traffic. This will be especially relevant in the case of planned (or unplanned) airspace excursion.</p> <p>This adds weight to the requirement for thorough knowledge of the airspace dimensions and construct for both aircrew and controllers as per Issue 1 (above).</p>

6. Proximity of Trial Airspace to Newcastle CTZ / Flamborough CTA	
Issue	The Stage 1 trial airspace abuts right up to eastern and northern edge of the Newcastle CTZ. This is unavoidable due to the legacy CACA lateral airspace dimensions that will be used in Stage 1. (Due to limitations on system adaptations with NATS that preclude change in the timescale required to support Stage 1 of the trial). As per CAA Safety Buffer Policy for SUA High-energy manoeuvres are not allowed within 5nm / 2000' of a CTZ or CTA.
Risk	<i>Military exercise traffic (probably fast-jet) could inadvertently perform high-energy manoeuvres at less than the prescribed separation from controlled airspace.</i>
Mitigation	<p>Stage 2 have a buffer built into their design, so this risk is only an issue for Stage 1.</p> <p>The MoD has long recognised the requirement for a buffer around Newcastle airspace, so this requirement is already understood. However, ASWC will introduce an avoidance area into the exercise Airspace Control Plan, which will apply between FL85 – FL125, 5nm from the Newcastle</p>

	<p>CTZ/Flamborough CTA as required and will affect fast-jet aircraft only. This will be briefed to exercise participants before exercise flying begins.</p> <p>ASWC have also offered Newcastle International the chance for a bi-lateral discussion to talk through the trial proposal, including the plan to add protection for the CTZ / CTA from high-energy manoeuvres.</p>
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