ACP-2020-092

GATEWAY DOCUMENTATION:
STAGE 2 DEVELOP AND ASSESS

STEP 2A DESIGN PRINCIPLE EVALUATION

Introduction

This document forms part of the overall submission of Stage 2A of ACP-2020-092 in accordance with the requirements laid out in CAP 1616.

The document aims to demonstrate to the CAA how the design options presented have responded to the design principles agreed at Stage 1B. This was achieved using the feedback received from stakeholders as well as an internal review of each design option against the standardised format laid out in Appendix E of CAP 1616.

The two design options evaluated in this document are:
1. Do nothing (baseline option)
2. Establishing FJA(N) and FJA(S) as per previous dimensions

Additional options were discounted by the sponsor at Stage 2A, which will be justified in greater detail during Stage 2B Initial Options Appraisal.

Design Principles

The table below displays a consolidated list of the DPs at the end of Stage 1B.

Priority	Design Principles
1	DP(a) The airspace design must be safe, with any hazards identified and risks mitigated such that they are as low as reasonably practicable and tolerable.
2	DP(b) Must be within reach of Navy Forces, more specifically a Carrier Strike Group (with embarked 5th generation air systems) operating within Deep Water, which through the development of the scenario is likely to span hundreds of miles. DP(c) Provides a sufficient mixture of overland and overseas areas which offers exercise planners flexibility to create more complex scenarios across both environments, for necessary littoral operations. DP(e) Must be of large enough size to accommodate representative operational numbers. DP(g) Will be FL 245 and above and suitable dimensions to minimise impact on other airspace users and the network, where possible.
3	DP(d) Crucially caters for kinetic and non-kinetic ranges within the area, which allows for necessary Air Land integration. DP(i) Minimise environmental impacts, where relevant.
4	DP(f) Safe, efficient and standardised management, notification and activation of airspace, utilising Flexible Use of Airspace (FUA) principles. DP(h) Minimise noise impacts, where relevant.

5	DP(k) Protocols for the prioritisation of area activation shall be established to minimise the accumulative overall effect of Defence airspace needs on other airspace users. DP(j) The design shall provide a Flight Plan Buffer Zone (FBZ) for the purposes of Free Route Operations and flight planning.

Table 1 - Design Principles

Design Principle Evaluation

Option 0 – Do nothing			
Description of option	**~~Accept~~ / Reject**		
Use the existing airspace structure – conduct exercises in non-segregated Class G and existing MDA structure.			
Design Principle A The airspace design must be safe, with any hazards identified and risks mitigated such that they are as low as reasonably practicable and tolerable.	**Not Met**	**Partial**	**Met**
The do-nothing option results in current and familiar airspace with no changes. However Large Force Exercises would continue to take place outside of segregated airspace and potentially outside the MDAs. ATS provision would lower the risk of MAC but not to As Low As Reasonably Practicable (ALARP). There would be no extra protection in the form of segregated airspace and buffer zones for either military or civil traffic.			
Design Principle B Must be within reach of Navy Forces, more specifically a Carrier Strike Group (with embarked 5th generation air systems) operating within Deep Water, which through the development of the scenario is likely to span hundreds of miles.	**Not Met**	**Partial**	**Met**
There are only two MDAs which would be within 150nm from preferred operating areas, which are EG D701 and EG D712. However, EG D712 would often be out of reach when an Aircraft Carrier is operating just North of Northern Ireland, for example. Air to Air refueling support cannot be guaranteed for Ex Joint Warrior due to enduring real-world commitments, therefore extending the range of the transit for the aircraft is not regularly achievable.			
Design Principle C Provides a sufficient mixture of overland and overseas areas which offers exercise planners flexibility to create more complex scenarios across both environments, for necessary littoral operations.	**Not Met**	**Partial**	**Met**
Out of all the segregated areas that are available, EG D712 is the only area that has a sizeable overland portion. Due to the limited size of EG D712, it would only be a partial solution as exercise planners would be unable to do certain training serials that require greater space due to the risk of accidently leaving segregated airspace during High Energy Maneuvers.			
Design Principle D Crucially caters for kinetic and non-kinetic ranges within the area, which allows for necessary Air Land integration.	**Not Met**	**Partial**	**Met**
EG D712 is the only area which has any ranges underneath it - D801/802/803. However, there isn't enough room to safely maneuver between the MDA and the range, given the segregated area finishes to the North side of the range.			

Design Principle E Must be of large enough size to accommodate representative operational numbers.	**Not Met**	**Partial**	**Met**
The minimum sized area for routine training for 5th generation aircraft has been determined by the Combat Air authorities as a portion of airspace 120nm x 60nm, which is greater than the available space in any current MDA except for the EG D323s and EG701s. The former is over 300nm away from preferred aircraft carrier operating areas (not meeting DP(b)) with the later having strict limitations on its use and being used extensively by other stakeholders, both military and civil.			
Design Principle F Safe, efficient and standardised management, notification and activation of airspace, utilising Flexible Use of Airspace (FUA) principles.	**Not Met**	**Partial**	**Met**
There are well established protocols for the management of MDAs which are safe, efficient and standardised.			
Design Principle G Will be FL 245 and above and suitable dimensions to minimise impact on other airspace users and the network, where possible.	**Not Met**	**Partial**	**Met**
There are MDAs which are FL245 and above, however, impact on other airspace users will not be able to be minimised as existing airspace structures will have to be used. This means Ex Joint Warrior activity would conflict with other military and non-military activity that is occurring in the danger areas, particularly EG D701s with the increase in commercial ventures such as space launches.			
Design Principle H Minimise noise impacts, where relevant.	**Not Met**	**Partial**	**Met**
There would be no change. Most of the current MDAs are over the high seas, overland areas have a base level of FL150.			
Design Principle I Minimise environmental impacts, where relevant.	**Not Met**	**Partial**	**Met**
The MoD is not required to assess the CO2 emissions of its traffic. However, with using the current MDAs, would lead to aircraft being routed around them, which results in increased CO2 emissions. More analysis will be conducted in the next stage to assess this impact.			
Design Principle J The design shall provide a Flight Plan Buffer Zone (FBZ) for the purposes of Free Route Operations and flight planning.	**Not Met**	**Partial**	**Met**
There would be no change. FBZ exist for the current MDAs.			
Design Principle K Protocols for the prioritisation of area activation shall be established to minimise the accumulative overall effect of Defence airspace needs on other airspace users.	**Not Met**	**Partial**	**Met**
There exist well established protocols for the management of MDAs.			

Option 0 Summary

Option 0, the do-nothing option, aimed to examine whether alternatives existed which would still facilitate the air elements of Ex Joint Warrior in accordance with the SoN. There are elements of the current MDAs that do satisfy individual DPs, however there is no specific danger area or combination of danger areas that can be used to facilitate everything that we require. Lastly, evaluating this option against our 5 highest priority DP's, it only partially meets four and does not meet one, showing clearly the current structures are unfit for Ex Joint Warrior. We are will only use this option in Stage 2B Options Appraisal as a comparison tool.

Option 1			
Description of option	**Accept / ~~Reject~~**		
Establishing FJA(N) and FJA(S) as per previous dimensions			
Design Principle A The airspace design must be safe, with any hazards identified and risks mitigated such that they are as low as reasonably practicable and tolerable.	**Not Met**	**Partial**	**Met**
An exclusive, segregated portion of airspace reduces the probability of MAC between exercise participants and GA. Flight Plan Buffer Zones (FBZs) will be implemented with activation by MAMC would ensure that exercise traffic and GAT are kept separate. Lastly, the FJAs have been used for over 10 years without any safety issues with the airspace design (see safety case in Stage 2B – Options Appraisal for more detail.)			
Design Principle B Must be within reach of Navy Forces, more specifically a Carrier Strike Group (with embarked 5th generation air systems) operating within Deep Water, which through the development of the scenario is likely to span hundreds of miles.	**Not Met**	**Partial**	**Met**
Having two volumes of airspace dis-located would mean exercise planers will always have a volume of segregated airspace they can operated in without Air to Air refueling support. With the FJAs being airspace that only JTEPS can use will ensure it will always be available (except deconflictions with opposing airspace, which will be explored in Stage 3 more.)			
Design Principle C Provides a sufficient mixture of overland and overseas areas which offers exercise planners flexibility to create more complex scenarios across both environments, for necessary littoral operations.	**Not Met**	**Partial**	**Met**
Both FJA(N) and FJA(S) have overland portions where emitters and/or ranges beneath the airspace can be used to create more complex scenarios. They also both have sizeable oversea areas to allow training over both environments.			
Design Principle D Crucially caters for kinetic and non-kinetic ranges within the area, which allows for necessary Air Land integration.	**Not Met**	**Partial**	**Met**
FJA(N) has EG D801/802/803 and EG D703 underneath it, and enough segregated airspace surrounding it to reduce the chance of accidently leaving segregated airspace when entering/leaving the ranges, reducing the chance of MAC.			
Design Principle E Must be of large enough size to accommodate representative operational numbers.	**Not Met**	**Partial**	**Met**
FJA(N) is larger than 120nm x 60nm, therefore can conduct training involving 5th generation aircraft, which facilitates operational numbers required to meet training objectives.			
Design Principle F	**Not Met**	**Partial**	**Met**

Safe, efficient and standardised management, notification and activation of airspace, utilising Flexible Use of Airspace (FUA) principles.			
The proposed SUA could be managed by AMC and activated via NOTAM. It should only be activated for specific, names exercises, generally for durations of 2.5 hours at a time. The MoD would seek to design protocols and/or LOAs between MoD, NATS and Swanwick to prohibit the activation of other MDAs concurrently so allow other airspace stakeholders use of airspace to transit through / operate in.			
Design Principle G Will be FL 245 and above and suitable dimensions to minimise impact on other airspace users and the network, where possible.	**Not Met**	**Partial**	**Met**
Using the FJAs will mean other airspace stakeholders will be able to use the current MDAs therefore minimising the impact on them. Keeping the base level of the airspace at FL 245 will ensure it does not impact the vast majority of airspace users. However, considering the location of both proposed airspaces, activation of this airspace will impact Oceanic air traffic routes, causing GAT to be routed around the FJAs, esp FJA(S). Activation of the airspace will only happen when it's necessary because of the impact it will have.			
Design Principle H Minimise noise impacts, where relevant.	**Not Met**	**Partial**	**Met**
The base level of the airspace will be FL 245 to reduce the noise impacts. The overland areas are over very spare populations to reduce the noise impact further.			
Design Principle I Minimise environmental impacts, where relevant.	**Not Met**	**Partial**	**Met**
MoD is not required to assess CO_2 emissions for military aircraft but to assess whether there is an impact due to aircraft having to re-route as a result of the change. The sponsor will work with NATS or Eurocontrol to assess the CO_2 impact of airspace designs and, during Stage 3, modelling will be requested during to evaluate the number of aircraft affected and the number of extra (if any) track miles flown. The Department for Transport formulae will then be used to work out a value for the CO_2 emissions.			
Design Principle J The design shall provide a Flight Plan Buffer Zone (FBZ) for the purposes of Free Route Operations and flight planning.	**Not Met**	**Partial**	**Met**
FBZs will be incorporated in the design for the purposes of FRA and flight planning.			
Design Principle K Protocols for the prioritisation of area activation shall be established to minimise the accumulative overall effect of Defence airspace needs on other airspace users.	**Not Met**	**Partial**	**Met**
Protocols could be agreed restricting activations of multiple volumes of SUA and enable GAT to flight plan. MAMC would continue to co-ordinate and prioritise requests, including for this proposed airspace, should it be approved.			

Option 1 Summary

This option meets 9/11 of the DPs, with 2 DPs partially met. With any large force exercise, unfortunately there will always be an impact to other airspace users. Producing a Letter of Agreement to look at suppressing other airspace during FJA activation and having the airspace AMC managed will mitigate some of this impact to the network. This is largely the same for environmental impacts; wherever we operated a large portion as airspace is going to have to be segregated, therefore GAT will have to be routed around. As mentioned, the sponsor will work with NATS or Eurocontrol to assess the CO_2 impact of airspace designs, which will enable the impacts to be minimised.

Conclusion

The proposed option, 'Establishing FJA(N) and FJA(S) as per previous dimensions' is a significantly better option than option 0, do nothing. For option 1, The DPs that are identified as 'partial' will be met with further consultation with stakeholders. The most important DP, that of safety, is key in this proposal and this document and the Options Development document highlight that use of unsegregated airspace poses more of a risk to participating aircraft and to GAT. The sponsor will continue to engage and will consider all new information which arises.

Continued engagement and consultation will take place with any findings taken into consideration. Stage 3 will quantify the effects; the sponsor intends to use information obtained from the Eurocontrol Network Manager to inform this proposal.