CAA Operational Assessment

Title of airspace change proposal	Removal of the en-route dependency from the Manchester (MCT) DVOR
Change sponsor	NATS Enroute PLC (NERL)
Project no.	ACP-2020-018
SARG project leader	[redacted]
Case study commencement date	25 August 2021
Case study report as at	21 January 2022

Instructions

In providing a response for each question, please ensure that the 'status' column is completed using the following options:

- yes
- no
- partially
- n/a

To aid the SARG project leader's efficient project management it may be useful that each question is also highlighted accordingly to illustrate what is:

resolved Green not resolved Amber not compliant Red

Executive Summary

This ACP is part of the NATS programme to rationalise the ground-based navigation infrastructure within the UK, in line with agreed national and international strategies. It further progresses the implementation of PBN within the UK. Specifically, this ACP removes the NATS dependencies on the Manchester (MCT) DVOR – mainly by withdrawing or amending those airport standard instrument arrival routes (STARs) and replicating those HOLDS or UK ATS Routes that are currently reliant on the DVOR.

These procedures are summarised below:

- Birmingham Airport: CHASE 4B/3F/3G/3H STARs

- East Midlands Airport: ROKUP 1B/1F/1G/1K STARs

- Manchester Airport: ROSUN 2A/2B/4D/2E/1F/1G STARs & ROSUN Hold, DALEY 2A/2B/4D/2E/1F/1G STARs & DALEY Hold

Finally, as part of an ongoing review of the UK AIP, it proposes administrative changes to some of the ATS routes in the vicinity of MCT to bring them into line with current best practice in terms of naming and definition conventions.

1.	Justification for change and options analysis (operational/technical)	Status
1.1	Is the explanation of the proposed change clear and understood?	Yes
	Yes. This ACP is primarily focused on en-route IFPs, in the UK AIP, which use the MCT DVOR as materially important navaids. The scope of the proposal includes STARs, their associated holding patterns and holds, referring to the afore mentioned facilities as conventional navaids and ATS routes which reference the VORs/NDBs, where NATS is the primary air navigation services provider (ANSP). At present, NATS operates 46 DVORs which will be rationalised, in a phased reduction, to 19 DVORs as part of the NATS DVOR Rationalisation Programme. The batch of changes resulting from this ACP will remove the en-route dependencies from the MCT DVOR.	
1.2	Are the reasons for the change stated and acceptable?	Yes
	Yes. In line with the European Navigation Strategy, NATS submitted plans for the progressive rationalisation of elements of the UK's ground navigation infrastructure, for which they were responsible for under the terms of their operating licence. The CAA supported this concept.	
1.3	Have all appropriate alternative options been considered, including the 'do nothing' option?	Yes
	Yes. Four options were considered, including do nothing. Only option 2 (Examine the use of existing STARS and holds from a practical point of view, re-evaluate how they are used and how network may be improved by rationalising/truncating/replicating them in a considered manner) adequately addresses the internationally agreed strategic aims to remove the en-route dependencies on VORs. Other potential options would generate nugatory costs for no benefit or cause unnecessary disruption to current aviation operations.	
1.4	Is the justification for the selection of the proposed option sound and acceptable?	Yes

	Yes. The primary objective for this proposed ACP is to remove any en-route IFP dependencies on the MCT DVOR. This will be achieved by: • Using RNAV1 procedures to replace the current connectivity based on MCT; or • Withdrawing the MCT-dependent procedures completely where they are no longer used or are duplicated by existing RNAV 5 and new RNAV 1 procedures. The en-route flight procedures under consideration are either STARs, en-route holding patterns and terminal holding patterns where MCT is used in their definition. The Design Principle was that there would be no change to the current operation, underpinned by the following criteria: Design Principle 0: maintain or enhance the current level of safety Design Principle 1: no change to flight behaviours Design Principle 2: administrative change Design Principle 3: withdraw unnecessary STARs Design Principle 4: replicate using RNAV replication policies Design Principle 5: technical amendment All options were appraised with the following conclusions: The first Option 0, of doing nothing, did not meet any of the Design Principles except for DP0 and DP1: maintain/ enhance the current level of safety and introduce no changes to flight behaviours. Option 0 therefore does not achieve the removal of dependencies from the MCT DVOR nor improve the network in any way; and has therefore been rejected. Option 1 - replication of each STAR/ Hold - fully met four Design Principles: maintain/ enhance the current level of safety; introduce no changes to flight behaviours; withdraw unnecessary STARs; and replicate using RNAV replication policies. However, it did not meet any of the final two Design Principles. Although Option 1 removes the MCT DVOR dependency, it does not improve the network connectivity; does not account for current usage levels and it leaves route duplication in place. Therefore Option 1 has also been rejected. Although Option 3 removes dependencies from the MCT DVOR, as a consequence of removing all IFPs, it does not fully meet any of the six Design Principles, offering no network improvements but significant disruption. Option 3 was therefore rejected. Option 2 involves an individual evaluation of each STAR and Hold. As this option focussed on a flexible approach for removing the DVOR dependencies, it was able to fully meet all the Design Principles. The option will also maintain current safety levels,

	introducing no change to flight behaviour beyond minor consequential effects as a result of RNAV replication, proposing an appropriate PBN specification and improving network design. The proposal has been refined during its development to take account of operational experience with recent similar ACPs.	
2.	**Airspace description and operational arrangements**	**Status**
2.1	Is the type of proposed airspace design clearly stated and understood?	Yes
	Yes. This ACP involves changes to en-route IFPs, associated Holds and ATS Routes. Thera are no impacts to airspace boundaries. STARS will be RNAV 1 replicated to replace the existing conventional procedures. Alongside the RNAV1 replication and re-naming of procedures, this proposal will also extend several STARs which will incorporate existing important Descent Planning levels. The routeing of these new STARs will be created using RNAV1 design criteria to align as closely as possible with the existing routeing. For aircraft not suitably equipped to fly a RNAV1 STAR there will be a provision to flight-plan a route which is coincident with the new RNAV1 procedure. This will be achieved by: • Following the ATS route whilst this is coincident with the STAR. • Once the STAR deviates from the ATS route, aircraft will follow a series of DCTs (as detailed in the SRD) coincident with the STAR, terminating at the holding fix. • ATC will tactically manage these aircraft, providing Heading/Level/Speed/Holding instructions as necessary.	
2.2	Are the hours of operation of the airspace and any seasonal variations stated and acceptable?	Yes
	Yes. H24. This is in line with the current practice, so no change. The STARs that will interact with TRA006 will be restricted via the RAD H24. This is to prevent the STAR being flight planned while the TRA is active. Although TRA006 is not H24 to make the management of the STAR simpler and to account for short notice changes to the activation of the TRA the restrictions will be H24.	
2.3	Is any interaction with adjacent domestic and international airspace structures stated and acceptable including an explanation of how connectivity is to be achieved? Has the agreement of adjacent States been secured in respect of High Seas airspace changes?	Yes
	Yes. This ACP involves no additional interactions introduced by these procedures. All procedures will be contained within extant	

airspace and has no impact on international airspace structures or High Seas' airspace. Replication of several STARs either replicate existing interactions with TRA006 or introduce the potential for increased interaction. However, this has been mitigated via the RAD restrictions being proposed and the addition of reporting point FIZED at the TRA boundary. FIZED is for controlling planning and is located at the western edge of the TRA so that controllers will be able to maintain aircraft at FL250 and therefore be outside of the TRA.

The controlling authority for TRA006 has been fully engaged in the ACP process and has no objections to the proposal.

2.4	Is the supporting statistical evidence relevant and acceptable?	Yes

Yes. By replicating the STARS in scoping using RNAV1, this will cater to the PBN equipage of >95.995 of the arrivals into the stakeholder airports (Q3 2019 figures).

Airport	STAR	Planned Arrivals on in-scope STARS		RNAV5 %	Calculated Number of RNAV5 equipped aircraft on in-scope STARs	
		Total	Per STAR		Total	Per STAR
EGBB	CHASE 4B	7261	4967	2.64	192	131
	CHASE 3F		126			3
	CHASE 3G		566			15
	CHASE 3H		1602			42
EGNX	ROKUP 1B	5101	3627	4.01	205	145
	ROKUP 1F		616			25
	ROKUP 1G		803			32

			ROKUP 1K		55			2
		EGCC	ROSUN 2A	16593	4655	2.44	405	114
			ROSUN 2B		94			2
			ROSUN 4D		1943			47
			ROSUN 1F		8880			217
			ROSUN 1G		1021			25
			ROSUN 2E	See Note 1.				
			DALEY 2A	See Note 2 & 3.				
			DALEY 2B					
			DALEY 4D					
			DALEY 2E					
			DALEY 1F					
			DALEY 1G					

Notes:

1. The ROSUN 2E STAR is being withdrawn as it is underutilised, CFMU data shows it has not been filed since 5th March 2019.
2. Aircraft which filed the DALEY STARs in 2019 are not included in this data.

	3. The DALEY STARs serving Manchester airport are contingency STARs for when MCT DVOR is out of service. As the dependency on MCT is being removed, these STARs are no longer required.	
2.5	Is the analysis of the impact of the traffic mix on complexity and workload of operations complete and satisfactory?	Yes
	Yes. The proportions of aircraft arriving at the relevant airports, including fleet mix and operators, would not differ as an outcome of the proposed changes. The proposed flight plan connectivity remains unchanged due to RNAV replication of the STARS, and the addition of flight-plannable DCTs for non-RNAV1 equipped aircraft; therefore, the usage would remain the same as today. There would be no change to pilot or controller behaviour, and no change to lateral or vertical traffic dispersion, beyond minor consequential effects, as a result of RNAV replication. There will be no impact on adjacent IFPs, or the airspace capacity. Therefore, the usage and current operation will stay the same as today.	
2.6	Are any draft Letters of Agreement and/or Memoranda of Understanding included and, if so, do they contain the commitments to resolve ATS procedures (ATSD) and airspace management requirements?	N/A
	Not applicable. This ACP involves no changes to existing arrangements.	
2.7	Should there be any other aviation activity (low flying, gliding, parachuting, microlight site etc) in the vicinity of the new airspace structure and no suitable operating agreements or ATC Procedures can be devised, what action has the change sponsor carried out to resolve any conflicting interests?	N/A
	Not applicable. This ACP has no impact as no practical change to the route structure in terms of controlled airspace boundaries etc.	
2.8	Is the evidence that the airspace design is compliant with ICAO SARPs, airspace design & FUA regulations, and Eurocontrol guidance satisfactory?	Yes
	Yes. IFP Design Report has been fully assessed by the IFP Regulator. All identified issues have been addressed. In this ACP, the sponsor proposed the use of a 5 Letter Name Code (5LNC) NUJOB which is “near located” to the Manchester (MCT) DME/VOR. In doing so, this will create a situation where two waypoints are located very close together resulting in various issues such as: - possible confusion between the use two waypoints - disconnect between aerodrome Instrument Flight Procedures and the en-route structure	

	- screen clutter when displaying the location of the two positions either in an FMS or other operational displays - un-necessary re-alignment of ATS routes through the new co-ordinates At present, there are still aerodrome dependencies on the MCT DME/VOR therefore the facility is expected to remain operational for aerodrome purposes for some time to come, the impact of "near located" 5LNC (NUJOB) will be prevalent for an unknown period of time, therefore this change is **not accepted** at this time.	
2.9	Is the proposed airspace classification stated and justification for that classification acceptable?	N/A
	Not applicable. This ACP entails no change to airspace classification.	
2.10	Within the constraints of safety and efficiency, does the airspace classification permit access to as many classes of user as practicable?	N/A
	Not applicable. This ACP involves no change to any access arrangements.	
2.11	Is there assurance, as far as practicable, against unauthorised incursions? (This is usually done through the classification and promulgation.)	Yes
	Yes. This ACP introduces no change to the current levels of risk associated with unauthorised incursions. The affected airspace is already controlled. However, the extension of several STARS back to LISBO does mean that the procedures are over/through TRA006. This is replicating the conventional procedure as it is today, but the proposal is to prevent aircraft from Flight Planning those affected STARS by use of RAD restrictions. This will prevent aircraft from joining the STAR below FL250 and therefore mitigates the risk of aircraft flying through the TRA when active.	
2.12	Is there a commitment to allow access to all airspace users seeking a transit through controlled airspace as per the classification, or in the event of such a request being denied, a service around the affected area?	N/A
	Not applicable. This ACP involves no new airspace structure or controlled airspace.	
2.13	Are appropriate arrangements for transiting aircraft in place in accordance with stated commitments?	N/A
	Not applicable. This ACP involves no new airspace structure or controlled airspace.	
2.14	Are any airspace user group's requirements not met?	No

	No. This ACP is explicitly designed to have no material impact on any airspace user group.	
2.15	Is any delegation of ATS justified and acceptable? (If yes, refer to Delegated ATS Procedure).	N/A
	Not applicable. This ACP involves no changes to the existing delegated ATS arrangements.	
2.16	Is the airspace design of sufficient dimensions with regard to expected aircraft navigation performance and manoeuvrability to contain horizontal and vertical flight activity (including holding patterns) and associated protected areas in both radar and non-radar environments?	N/A
	Not applicable. This ACP involves no changes to airspace dimensions.	
2.17	Have all safety buffer requirements (or mitigation of these) been identified and described satisfactorily (to be in accordance with the agreed parameters or show acceptable mitigation)? (Refer to buffer policy letter.)	N/A
	Not applicable. This ACP involves no changes to the airspace structure requiring re-consideration of the safety buffer requirements.	
2.18	Do ATC procedures ensure the maintenance of prescribed separation between traffic inside a new airspace structure and traffic within existing adjacent or other new airspace structures?	Yes
	The proposal includes replication of a STAR and extension of several STARs that will result in the STAR going either through or over TRA006. To prevent the STAR being flight plannable while the TRA is active a RAD restriction will be in place to prevent the STAR from being joined below FL250. The upper limit of the TRA is FL245 so this will prevent aircraft from planning to join the STAR at FL230 210 etc. To allow for controllers to tactically manage descent below FL250 and to plan descent, a new point FIZED is being introduced, which is at the TRA boundary.	
2.19	Is the airspace structure designed to ensure that adequate and appropriate terrain clearance can be readily applied within and adjacent to the proposed airspace?	Yes
	Yes. All affected airspace is over 7000ft above mean sea level and thus has adequate terrain clearance. In any case, the ACP explicitly results in no change to lateral or vertical tracks.	

2.20	If the new structure lies close to another airspace structure or overlaps an associated airspace structure, have appropriate operating arrangements been agreed?	N/A
	Not applicable. This ACP involves no new airspace structures.	
2.21	Where terminal and en-route structures adjoin, is the effective integration of departure and arrival routes achieved?	Yes
	There are no changes to departure routes in this proposal. There are no changes to the connectivity between the relevant en-route and terminal structures. The proposed changes are technical and will not alter lateral or vertical traffic dispersion.	
3.	**Supporting resources and communications, navigation and surveillance Status (CNS) infrastructure**	
3.1	Is the evidence of supporting CNS infrastructure together with availability and contingency procedures complete and acceptable? The following are to be satisfied:	
	• **Communication**: Is the evidence of communications infrastructure including RT coverage together with availability and contingency procedures complete and acceptable? Has this frequency been agreed with AAA Infrastructure?	N/A
	Not applicable. This ACP involves no new communications infrastructure requirements. Standard radio-fail contingency procedures remain appropriate. Existing contingency procedures based on the conventional navigation MCT DVOR would no longer be required and will be withdrawn. RNAV replication removes the en-route dependency from the MCT DVOR. Other existing contingency procedures and management will continue to apply as today.	
	• **Navigation:** Is there sufficient accurate navigational guidance based on in-line VOR or NDB or by approved RNAV-derived sources, to contain the aircraft within the route to the published RNP value in accordance with ICAO/ Eurocontrol standards? For example, for navaids, has coverage assessment been made, such as a DEMETER report, and if so, is it satisfactory?	Yes
	Yes. DEMETER coverage diagram included as part of the NATS Design document and assessed as satisfactory for the airspace affected by this ACP.	
	• **Surveillance:** Radar provision – have radar diagrams been provided, and do they show that the ATS	N/A

	route/airspace structure can be supported?	
	Not applicable. This ACP involves no changes to tracks over the ground. Existing radar coverage will suffice.	
3.2	Where appropriate, are there any indications of the resources to be applied, or a commitment to provide them, in line with current forecast traffic growth acceptable?	N/A
	Not applicable. This proposal is not directly linked to any anticipated growth in traffic or change in traffic mix. There are no resource implications.	
4.	**Maps/charts/diagrams**	**Status**
4.1	Is a diagram of the proposed airspace included in the proposal, clearly showing the dimensions and WGS84 co-ordinates? (We would expect sponsors to include clear maps and diagrams of the proposed airspace structure(s) – they do not have to accord with aeronautical cartographical standards (see airspace change guidance), rather they should be clear and unambiguous and reflect precisely the narrative descriptions of the proposals).	N/A
	Not applicable. This ACP involves no changes to airspace dimensions or structures. This ACP affects some ATS routes, STARs and Holds, not a single block of airspace. Multiple diagrams have been provided showing the individual affected structures (diagrams are linked in the submission at Ref 2: Assessment Meeting Minutes). WGS-84 coordinates for the relevant points will remain as those already published in the existing AIP.	
4.2	Do the charts clearly indicate the proposed airspace change?	Yes
	All changes to hold and STARs are clearly indicated on the relevant charts. There are no changes to the horizontal dimensions of the routes to indicate on the charts.	
4.3	Has the change sponsor identified AIP pages affected by the change proposal and provided a draft	Yes

	amendment?	
	Draft submission has been assessed and approved.	
4.4	Has the change sponsor completed the WGS84 spreadsheet and submitted to the CAA for approval?	Yes
	Aerodata Sheet assessed and approved.	
5.	**Operational impact**	**Status**
5.1	Is the change sponsor's analysis of the impact of the change on all airspace users, airfields and traffic levels, and evidence of mitigation of the effects of the change on any of these, complete and satisfactory? Consideration should be given to:	
	a) Impact on IFR General Aviation traffic, on Operational air traffic or on VFR General Aviation traffic flow in or through the area.	Yes
	No impact. These changes affect the en-route dependencies on the MCT DVOR. Removing the en-route dependencies from this DVOR will not impact on IFR GA/OAT or on VFR GA in or through the area.	
	b) Impact on VFR Routes.	Yes
	No impact. These changes are wholly contained within extant controlled airspace. This ACP will not change the classification of the airspace.	
	c) Consequential effects on procedures and capacity, i.e. on SIDs, STARs, holds. Details of existing or planned routes and holds.	Yes
	Yes. This ACP involves changes that are technical amendments only with no impact on procedures or capacity.	
	d) Impact on airfields and other specific activities within or adjacent to the proposed airspace.	Yes
	No material impacts have been identified by the sponsor. The proposed changes are primarily administrative, or irrelevant as far as the airports are concerned.	

	e) Any flight planning restrictions and/ or route requirements.	Yes
	No material change. Existing ATS routes and IFPs which are currently utilised and flight-plannable will remain flight-plannable after the change, just with new names in some cases. RNAV 5 aircraft will follow a series of DCTs and be tactically managed to follow the same route as the RNAV1 STARs. Use of RAD restrictions for the STARs that interact with TRA006 will prevent those STARs being flight plannable H24 to allow the TRA to be used H24 and avoid any issues should the standard operational hours of TR0006 be extended.	
5.2	Does the change sponsor consultation material reflect the likely operational impact of the change?	Yes
	A consultation on the rationalisation of DVOR infrastructure from 46 sites down to 19 was conducted with the National Air Traffic Management Advisory Committee (NATMAC) in 2008. NATMAC have been updated on the programme in 2010 and 2018. The proposals are of a technical nature which will not lead to any material change to the current operation: there is no impact expected below 7000 ft with no new controlled airspace and no impact on aircraft tracks over the ground. The CAA has previously agreed that since the proposals will result in no discernible impact to stakeholders on the ground there is no requirement for a full consultation to be conducted with members of the public for this ACP. The change sponsor has carried out engagement activity by email with Manchester, Birmingham and East Midlands Airports being those that will be affected by the MCT DVOR change in terms of notification of the proposed changes, justification and timeline. Evidence to that effect has been provided within a submission of engagement activity.	
Case study conclusions – to be completed by SARG project leader		**Yes/No**
Has the change sponsor met the SARG airspace change proposal requirements and airspace regulatory requirements above?		Yes
Yes. The sponsor has met the relevant regulatory requirements and therefore this proposal should be approved.		
RECOMMENDATIONS/CONDITIONS/PIR DATA REQUIREMENTS		
Are there any Recommendations which the change sponsor should try to address either before or after implementation (if approved)? If yes, please list them below.		No

GUIDANCE NOTE: *Recommendations are something that the change sponsor **should try** to address either before or after implementation, if indeed the airspace change proposal is approved. They may relate to an area in which the change sponsor is reliant upon a third party to actually come to an agreement and consequently they do not carry the same 'weight' as a Condition.*

Are there any Condition(s) which the change sponsor **must fulfil** either before or after implementation (if approved)? If yes, please list them below.	No

GUIDANCE NOTE: Conditions are something that the change sponsor **must fulfil** either before or after implementation, if indeed the airspace change proposal is approved. If their proposal is approved, change sponsors **must observe** any condition(s) contained within the regulatory decision; failure to do so **will usually** result in the approval being revoked. Conditions should specify the consequence of failing to meet that condition, whether that be revoking the ACP or some alternative.

Are there any specific requirements in terms of the data to be collected by the change sponsor for the Post Implementation Review (if approved)? If yes, please list them below.	Yes

GUIDANCE NOTE: PIR data requirements concerns any specific data which the change sponsor **must** collate post-implementation, if indeed the airspace change proposal is approved. Please use this section to list any such requirements so that they can be captured in the regulatory decision accordingly.

- Recorded flight data to demonstrate that there have been no material changes to flight paths or traffic distribution.
- Data to capture all Flight Plans that have been accepted on STARs through the TRA.

General summary

This ACP is intended to have no material impact on aircraft behaviours. It represents one of a series of enablers for the modernisation of UK airspace by removing reliance on out-dated navigation aids and the distinction between upper and lower ATS routes.

Comments and observations

The sponsor has fully addressed the issues identified within this ACP and has provided the required justification for the proposed changes. Clarification responses have been accepted regarding the proposed STARs and the interaction with TRA006. The use of NUJOB (5LNC) to replace MCT has not been approved and the sponsor has made the necessary changes to the ACP and IFP Designs to reflect this position.

Level 2 ACP Operational assessment sign-off	Name	Signature	
Operational assessment completed by Airspace Regulator (Technical)	[redacted]	[redacted]	21 Jan 2022
Principal Airspace Regulator comment / Decision	**Name**	**Signature**	
Operational assessment conclusions approved by Principal Airspace Regulator	[redacted]	[redacted]	16 Feb 2022

Principal Airspace Regulator Comments and Decision:

Noting the withdrawal of the 5LNC NUJOB from the proposal for the reasons detailed above, this ACP is approved.