BCN DVOR Rationalisation
Stage 4 Update and Submit

Airspace Change Proposal
Issue 1.0

NATS Unclassified

Publication History

Issue	Month/Year	Change Requests in this issue
Issue 1.0	October/ 2020	Published and submitted to CAA SARG

1. Contents

2. Introduction

The intent of this document is to summarise and satisfy the requirements of CAP1616 Stage 4: update design and submit airspace change proposal to the CAA. The CAA reference is ACP-2019-069, the link to the CAA portal page is here.

NATS operates 46 DVORs and NDBs around the UK which are going through the first batch of rationalisation as part of NATS' DVOR Rationalisation Programme. This is due to the DVORs operating well beyond their design life and no longer being needed due to RNAV5 (Area Navigation - 5NM) mandated Air Traffic Service (ATS) routes since 2009. This extended period of use has also created continued and unnecessary maintenance costs; as well as impacting upon airport development work prevented by safeguarding the radio navigation aids (navaids).

Within the UK, there are several en-route Instrument Flight Procedures (IFP) which are dependent on these navaids. As a number of them are scheduled to be removed from service, the en-route IFP definitions require updating so that they no longer refer to the navaids scheduled to be removed.

This airspace proposal is primarily focused on en-route IFPs, in the UK Aeronautical Information Publication (AIP), which use the Brecon (BCN) DVOR as a materially important navaid. The scope of the proposal includes Standard Terminal Arrival Routes (STARs) and holding patterns dependent on/ referencing the BCN DVOR as a conventional navaid; where NATS is the primary Air Navigation Services Provider (ANSP).

Airport-based procedures such as Standard Instrument Departures (SIDs) and Instrument Approach Procedures (IAPs) are not relevant to the en-route scope of this proposal. Airport operators are separately developing their own equivalent procedures to mitigate the removal of the BCN DVOR.

As described in Section 8.2.1 below, there are several methods in which a STAR or a Hold's dependency on a navaid can be removed. As such, each STAR and Hold has been evaluated in order to determine the most

appropriate method in which to remove the dependency from the BCN DVOR. This method improves the overall network connectivity, reduces duplication and accounts for the current usage levels.

3. Executive Summary

In support of the DVOR Rationalisation Programme, NATS has identified all AIP en-route dependencies on, and references to, the BCN DVOR. In order to remove IFP dependencies from these navaids, a list of five Design Principles (DPs) were created and used to assess the individual IFPs against. As covered fully in the Stage 1B document (Ref 3), the Design Principles for this BCN DVOR ACP were reviewed to ensure that they are still relevant; a consistent set having been used throughout the DVOR Programme.

The Design Principle (DP1) with overriding priority is that the airspace change must "*maintain or enhance the current level of safety*". The Design Principle (DP2), driving this change is that none of the proposed technical changes would result in a change to flight behaviours. The remaining three Design Principles focus on techniques which could be used to remove the DVOR dependencies, using an appropriate standard of PBN and where appropriate, facilitate an optimised airspace design.

As described in the Stage 2 Gateway documentation (Ref 4), the following four separate design options were developed in order to remove the identified en-route IFP dependencies from the BCN DVOR:

- Option 0 (do nothing): retain all of the current STARs and Holds unchanged from today's AIP definition.
- Option 1: replicate each IFP with a dependency on the BCN DVOR by replacing existing conventional procedures using Performance Based Navigation (PBN) procedures.
- Option 2: evaluate the use of existing STARs and Holds from a practical point of view; re-evaluate how they are used and how the network may be improved by rationalising/ truncating/ replicating them in a considered manner.
- Option 3: completely remove each IFP with a dependency on the BCN DVOR.

The five Design Principles were used to qualitatively assess each of the four design options (Ref 4). This process reduced the four design options down to one (Option 2) which is the preferred concept option presented here. Consultation regarding DVOR rationalisation was undertaken in 2008. Due to the technical nature of the changes which will not result in changes to flight paths, no further consultation has been required.

4. Current Airspace Description

The current en-route IFPs which are dependent on the BCN DVOR as an essential navaid are associated with Bristol and Cardiff airports. These are summarised in Table 1 below and the relevant charts can be found in the Stage 2 Gateway document (Ref 4).

Associated Airport	Current IFP	Current Routing	BCN DVOR Dependency
Bristol	BRI 1A STAR	*RETSI - AMRAL - RILES - DOBEM - INGUR - BRI*	Not dependent – Speed Limit Point (SLP) defined by BCN
Bristol	BRI 1E STAR	*TALGA - BCN - BRI*	Yes – dependent on BCN
Bristol	BRI 1B STAR	*STU - AMMAN - BCN - BRI*	Yes – dependent on BCN
Bristol	BRI 1C STAR	*CPT - POMAX - BRI*	Not dependent – geographically close to BCN and STAR requires renaming
Bristol	BRI 2D STAR	*BHD - TINAN - TIVER - EXMOR - BRI*	Not dependent – SLP defined by BCN
Bristol	ADVED 1A STAR	*EXMOR - ADVED*	Not dependent
Bristol	BAXUN 1A STAR	*EXMOR - ROTLU - BAXUN*	Not dependent
Cardiff	CDF 1A STAR	*RETSI - AMRAL - RILES - DOBEM - KUKIS - CDF*	Not dependent – SLP defined by BCN

Associated Airport	Current IFP	Current Routing	BCN DVOR Dependency
Cardiff	CDF 1E STAR	*TALGA - BCN - CDF*	Yes – dependent on BCN
Cardiff	CDF 1B STAR	*STU - AMMAN - BCN - CDF*	Yes – dependent on BCN
Cardiff	CDF 1C STAR	*CPT - ABDAL - BRI - CDF*	Not dependent – geographically close to BCN and STAR requires renaming
Cardiff	CDF 3D STAR	*BHD - TINAN - TIVER - EXMOR - CDF*	Not dependent – SLP defined by BCN
Bristol	Bristol Hold	N/A	Not dependent
Cardiff	Cardiff Hold	N/A	Not dependent

Table 1: Summary of Current IFPs

4.1 Structures and Routes

The full technical notes and associated charts for each of the above current IFPs, listed in Table 1, can be found in the Assessment Meeting slide pack (Ref 2).

4.2 Airspace usage and proposed effect

The proportions of aircraft, including fleet mix and operators, using any of the IFPs related to this project would not change as an outcome of the proposed changes. The proposed flight plan connectivity remains entirely unchanged due to RNAV replication of the STARS; 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, nor any impact on adjacent IFPs.

Alongside the RNAV replication and re-naming of procedures, this proposal will also extend or truncate several STARs which will incorporate existing important Descent Planning levels. The routeing of these 8 new STARs - 2 extensions and 6 truncations – will be created using RNAV design criteria to align as closely as possible with the existing routeing. Further information can be found in Sections 15.3 and 15.4 below.

None of the proposed design changes will introduce any change to pilot or controller behaviour; no change to lateral or vertical traffic dispersion; nor any impact on adjacent IFPs. Therefore, the airspace capacity, usage and current operation will stay the same as today.

4.3 Operational efficiency, complexity, delays and choke points

There are no specific issues relating to operational efficiency, complexity, delays or choke points associated with any of the IFPs related to this airspace change proposal.

4.4 Safety issues

There are no specific safety issues associated with any of the IFPs related to this airspace change proposal.

Ensuring the safety of the proposed changes is a priority for NATS. NATS has a dedicated safety manager for the DVOR Rationalisation Programme who ensures that the safety representatives from SARG have oversight of the safety assurance process. Section 10 contains further details on the safety assessment for this proposal.

4.5 Environmental issues

There are no specific environmental issues associated with any of the IFPs related to this project, to be solved by this airspace change proposal.

5. Statement of Need

The Statement of Need (Ref 1) submitted in August 2020 for this proposal summarises the proposed changes in support of removing the en-route dependency from the BCN DVOR. This has been included in Section 15.2.

6. Proposed Airspace Description

6.1 Objectives/ requirements for Proposed Design

The primary objective for this proposed airspace design is to remove all en-route IFP dependencies from the BCN DVOR; this will be achieved by replacing the current connectivity using RNAV5 procedures. The en-route flight procedures under consideration are all STARs and holding patterns where BCN is material to their definition. Two additional STARs – one for Bristol and Cardiff Airport – have been included as they are geographically close to BCN and simply require re-naming.

These changes are in support of the NATS DVOR Rationalisation Programme which aims to reduce dependence on ground infrastructure without reducing en-route services.

The CAA's PBN STAR Replication Policy for Conventional STAR Replacement (Ref 8) has been used as a basis for this proposal. It defines PBN STAR Replication as *PBN compliant procedures that are intended to replace existing conventional STARs start from the commencement of the STAR in the ATS en-route network to the termination point (normally in the terminal environment) with the intention of retaining the existing route and track over the ground, shall be referred to as a replicated PBN STAR.*
RNAV5 is mandated for en-route IFPs and does not require consultation under the CAA's replication policy.

This proposal has been used as an opportunity to review the relevance of the existing procedures and their details. As such, methods including extending back RNAV versions of existing STARs - to ensure that important Descent Planning Levels are incorporated - have been explored and considered. In some cases, this will require the establishment of slightly amended STARs to ensure that all flight options and levels are captured; but will not change the lateral track or vertical profile of traffic flown today. This had been in line with the STAR replication policy mentioned above.

6.2 Proposed New Airspace/ Route Definition and Usage

There is no predicted change to current connectivity or flight behaviour as a consequence of this airspace change proposal; the proposed changes are only technical changes. This means that there would be no change to pilot or controller behaviour (apart from designation changes), and no change to lateral or vertical traffic dispersion, nor any impact on adjacent IFPs. The proposed changes will also not alter route usage or traffic mix within the associated airspace.

A full summary of all the proposed changes and associated impacts can be found in Sections 15.3 to 15.4 below. This details the impact assessment which was completed for all IFPs where the BCN DVOR is material to the procedure, or they feature on the same chart. These procedures are summarised below:

- Bristol Airport: BRI 1A/ 1E/ 1B/ 1C/ 2D, ADVED 1A and BAXUN 1A STARs and BRI Hold
- Cardiff Airport: CDF 1A/ 1E/ 1B/ 1C/ 3D STARs and CDF Hold

Charts and technical notes on all of the above individual IFPs can be found in the Assessment Meeting slide pack (Ref 2), asides from the Bristol ADVED 1A and BAXUN 1A STARs which are simply being renamed as part of this proposal. The proposed changes to RNAV5 replication will not change the connectivity of the procedures from today with or without appropriate extensions. Where extended STARs are being proposed, appropriate

starting points for the STAR have been identified to ensure that there is no impact to connectivity. This means no change to route usage or traffic patterns over the ground.

As part of this change the BCN DVOR references will be removed from the AIP entry however as the DME will be retained, the 3LNC (*BCN*) will also be retained; therefore, there will be no impact to system adaptation. An update to the UK AIP section ENR3.3 will be required to reflect this change.

The location of the BCN DVOR/ DME will stay the same however, the description will be amended to *BCN DME* to denote the removal of the DVOR reference. The definition of the BCN DVOR will be removed from UK AIP ENR 4.1 but will need to be added to the airfield sections of the AIP as the DVOR will continue to support SID procedures. This change will not introduce any changes to traffic patterns. The relevant airspace structures, and related AIP sections, which are associated with the STAR and Hold changes, are listed in Table 2 below.

Airspace Structure	Comment	AIP Section
Aerodrome AIP changes	Individual airport charts, coding tables and text updated to reflect STAR and Hold changes	AD 2.EGFF-7-XX AD 2.EGGD-7-XX
Area Navigation Routes	All affected RNAV routes amended by this ACP to be included in this section	ENR 3.3
Radio Navigation Aids and Waypoints	BRECON will be amended	ENR 4.1

Table 2: Current Relevant Airspace Structures associated with Administrative Changes

The proposed procedure changes will not alter the traffic patterns or route usage, due to the truncation or replication of Holds and STARs. Further technical information on the proposed designs can be found in a document summarising the draft AIP changes and the associated AIP pages where these changes need to occur (Ref 6); alongside the NATS Design IFP report (Ref 7).

7. Impacts and Consultation

7.1 Net impacts summary for proposed route

Category	Impact	Evidence
Safety/ Complexity	No impact on safety or complexity	See Section 4.4 and Section 10
Capacity/Delay	No impact on capacity/ usage or delay	See Section 4.2
Fuel Efficiency/ CO_2	No impact, there will be no change to lateral or vertical tracks, nor to impact adjacent IFPs	See Section 7.7
Noise – Leq/ SEL	No impact, this is a Level 2C[1] change	See Section 7.8
Tranquillity, visual intrusion (AONBs & National Parks)	No impact, this is a Level 2C change	See Section 7.8
Local Air Quality	No impact, this is a Level 2C change	See Section 7.8
Other Airspace Users	No impact, no changes to volume or classification of CAS	See Sections 7.4 to 7.6

[1] The CAA agreed that this proposal falls under the airspace change process as a Level 2C proposal. This is a proposal which reflects the current use of airspace concerned and does not alter traffic patterns below 7,000ft. The Government's Air Navigation Guidance states that below 7,000ft is the maximum height at which noise is a priority for consideration; therefore, noise analysis has not been completed for this proposal.

7.2 Units affected by the proposal

In order to provide full transparency, NATS has engaged with the London Area Control Centre (an assumed associate throughout the DVOR programme), Bristol Airport and Cardiff Airport throughout the project (Ref 9). The airports have been fully engaged with on the proposed changes and briefed on the justification behind why the en-route DVOR dependencies are being removed. As covered in the engagement evidence (Ref 9), the airports also provided NATS with additional information on the current procedures such as typical holding levels. The airports have all confirmed support for the proposed changes. The changes have all been designed to be invisible from an airport's perspective, aside from the required updates to the AIP.

The proposed changes will alter nomenclature in the aerodrome AIP pages for the airports; where STAR names are being re-named. Appropriate airport representatives have been informed about these changes prior to submission of this ACP. There were no issues raised as part of the engagement nor any changes made to the proposed designs. Assuming approval of this ACP, the affected airports will then be advised, and permission sought to amend these sections of the AIP.

Asides from these changes, there are no other impacts anticipated for airports or relevant activities; the scope of these changes is just for en-route procedures, not airports. Airports will complete their own Airspace Change Proposals to remove navaid dependencies for airport procedures, such as SIDs and approaches. The changes are purely technical changes which will not lead to any material change to the current operation. If the proposal is approved, NATS will also organise appropriate co-ordination with ICAO prior to implementation.

7.3 Consultation

NATS took part in a (CAA-led) consultation with the National Air Traffic Management Advisory Committee (NATMAC) in 2008. NATMAC members were provided with a consultation paper which outlined NATS plans to rationalise the DVOR infrastructure; alongside being invited to provide feedback or questions on the proposal. As this consultation was completed before the introduction of CAP1616, there was not a requirement for NATS to engage or seek feedback on Design Principles.

A follow-up informative letter was sent to NATMAC members in 2010 which summarised the results of the consultation; including broad support from airlines and a recognised requirement for airports to remove their own airport procedure dependencies. NATS, through the DVOR Rationalisation Project, also provided the NATMAC members with an update on the project in 2018; including an explanation of the stages required to remove the navaid dependencies and how they will be physically removed from service.

7.4 Military impact and consultation

No military airspace user stakeholders were identified as being impacted by the proposed changes. The changes are purely technical changes which will not lead to any material change to the current operation.

7.5 General Aviation (GA) airspace users' impact and consultation

No GA stakeholders have been identified as being impacted by the proposed changes.

7.6 Commercial air transport impact and consultation

There would only be technical changes for commercial air transport such as nomenclature and RNAV5 route replication. There would be no impact to connectivity or flight behaviour, as there would be no change to lateral or vertical tracks, nor to impact adjacent IFPs.

No commercial air transport/ IFR stakeholders were identified as being impacted by the proposed changes; other than the nomenclature changes mentioned.

7.7 CO_2 environmental analysis impact and consultation

There would be no change in fuel, CO_2 or greenhouse gas emissions as a result of the proposed changes because there would no change to lateral or vertical tracks, or to impact adjacent IFPs. Fuel uplift changes are unlikely to occur. The actual fuel uplift is very difficult to quantify, however there is an established relationship between distance flown and the amount of fuel uplift. As this proposal will not impact the distance flown or vertical profile, we can deduce that the fuel uplift should not change.

This aligns with the Design Principle (DP1) which is driving this change, of ensuring that none of the proposed technical changes to IFP definitions result in any changes to actual flight behaviours.

7.8 Local environmental impacts and consultation

There would be no change in environmental impacts, such as noise or tranquillity, as a result of the proposed changes because there would be no change to lateral or vertical tracks, nor any impact to adjacent IFPs.

As outlined fully in the Stage 2 document (Ref 4), NATS has provided evidence on current procedure usage; including anecdotal evidence from Bristol/ Cardiff Airports and radar arrival plots. This was used to demonstrate that the changes within this proposal will not affect traffic below 7,000ft; and therefore, falls under the CAA's airspace change proposal as a Level 2C proposal.

This aligns with the Design Principle (DP1) which is driving this change, of ensuring that none of the proposed technical changes to IFP definitions result in any change to actual flight behaviours.

7.9 Economic impacts

The cost to the ANSP (NATS) for implementation of the change and adaptation of systems is estimated to be approx. £65,000.

Removal of the enroute dependency enables decommissioning of the DVOR (once airfields have removed their dependencies i.e. SIDs). This will yield an annual cost saving of circa £10,000 per VOR. However, the development of this ACP has not been motivated by economic constraints or opportunities.

8. Analysis of Options

8.1 Airspace Change Design Options

In order to remove the en-route IFP dependencies from the BCN DVOR, NATS developed four separate design options on how best to adapt the UK airspace. The design options are described fully in the Stage 2 Gateway document (Ref 4).

The first considered option (Option 0), of doing nothing, would retain all the current STARs and Holds unchanged from today's AIP definition. Options 1, 2 and 3 involve making changes to today's AIP definition:

- Option 1: Using CAA policies, RNAV replicate STARs/Holds, exactly as defined in the AIP without considering any practicalities.
- Option 2: Examine the use of existing STARs and Holds from a practical point of view, re-evaluate how they are used and how the network may be improved by rationalising/ truncating/ replicating them in a considered manner.
- Option 3: Remove all existing STARs and Holds that refer to, or use, the BCN DVOR.

8.2 Design Options Assessment

8.2.1 Design Principles

Design Principles have been created in order to assess the four design options. The previously submitted DVOR ACPs – which can be viewed on the CAA's online portal (link) – have all used a consistent set of Design

Principles. As covered in the Stage 1B document (Ref 3), the Design Principles were reviewed and updated as part of this submission.

The Design Principles have been constructed around the general objectives for this airspace change proposal: removing the en-route dependencies from the BCN DVOR; maintaining or enhancing safety levels; and introducing no change to actual flight behaviour. For example, this ACP will remove the en-route dependency of several Bristol and Cardiff procedures from the BCN DVOR.

There are an additional two principles which ensure that an appropriate standard of PBN is used and where appropriate, the proposed airspace will facilitate an optimised airspace design. For example, alongside removing the en-route dependency from BCN, this proposal also includes a number of STAR extensions/ truncations which ensure that current important descent planning levels are maintained, whilst introducing no change to flight behaviour.

These five Design Principles ensure that the core objectives of the DVOR programme are met, whilst also enabling improvements to the enroute network (where appropriate and in alignment with the other principles). Alongside all previous DVOR ACPs, the overriding Design Principle (DP0) - with the highest priority - for this airspace change is that the proposed airspace change must "*maintain or enhance the current level of safety*".

The five Design Principles for this proposal are:

Design Principle	Description
DP1 Safety	The proposed airspace change must maintain or enhance the current level of safety
DP2 No change to flight behaviour	None of the proposed technical changes to definitions of STARs/ Holds would result in a change to actual flight behaviours – laterally, vertically or in dispersal
DP3 PBN Specification	The proposed airspace change will yield maximum safety and efficiency benefits by using an appropriate standard of PBN
DP4 Remove DVOR Dependencies	Remove en-route dependencies on the BCN DVOR through appropriate design changes; including removing unnecessary references to the BCN DVOR which are not material to the procedure and rationalising rarely used STARs
DP5 Airspace Optimisation	Where appropriate, the proposed airspace will facilitate an optimised airspace design. Including: - Use PBN Replication – replacing conventional STARs/ Holds with RNAV STARs/ Holds - Using CAA STAR Truncation Policy, when applied logically to STARs with many common segments, can result in the withdrawal of unnecessary duplicate STARs - Minor changes to a STAR which currently cannot be flown as it is formally defined for legacy reasons – these changes reflect what would actually happen in practice - Extend or split a current STAR to allow important Descent Planning Levels to be formally incorporated in the STAR description

The five Design Principles summarised above have been detailed fully in the Stage 1B Gateway document (Ref 3), which includes a contextual example of each Design Principle being put into practice.

8.2.2 Options Assessment using the Design Principles

The four Design Options outlined in Section 8.1 were qualitatively assessed against each Design Principle (listed above), in order to evaluate whether the principle had been met, partially met or not met. A full summary of the options assessment can be found in Section 2 of the Stage 2 Gateway document (Ref 4).

The first Option 0: doing nothing, did not meet any of the other Design Principles except for DP1 and DP2: 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 BCN DVOR nor improve the network in any way; and has been rejected.

Option 1: replication of each STAR/ Hold - fully met four of the five Design Principles: maintain/ enhance the current level of safety; introduce no changes to flight behaviours; replicate procedures using an appropriate PBN specification; and removing the en-route dependencies on the BCN DVOR. However, Option 1 would not evaluate procedures for potential further airspace optimisation opportunities (DP5) and has therefore also been rejected.

Option 2 involves an individual evaluation of each STAR and Hold. As this option is focussed on a flexible approach for removing the DVOR dependencies, it was able to fully meet all the proposed Design Principles.

Although Option 3 removes dependencies from the BCN DVOR, thus meeting DP4 - as a consequence of removing all appropriate IFPs - it does not fully meet any of the additional four Design Principles: offering no network improvements but significant disruption. Option 3 was therefore rejected.

The conclusion of this assessment was to reduce the number of design options to one, known as Option 2 which best meets all the five Design Principles. This option removes the BCN DVOR dependencies whilst also maintaining current safety levels, introducing no change to flight behaviour, proposing an appropriate PBN specification and improving the overall network design.

9. Airspace Description Requirements

	The proposal should provide a full description of the proposed change including the following:	Description for this proposal
a	The type of route or structure; for example, airway, UAR, Conditional Route, Advisory Route, CTR, SIDs/ STARs, holding patterns etc.	STARs and holding patterns - see Section 6.
b	The hours of operation of the airspace and any seasonal variations	H24 (unchanged from today)
c	Interaction with domestic and international en-route structures, TMAs or CTAs with an explanation of how connectivity is to be achieved. Connectivity to aerodromes not connected to CAS should be covered	This proposal would not have any impact on current connectivity - see Section 6.2 and Sections 15.3 to 15.4.
d	Airspace buffer requirements (if any). Where applicable describe how the CAA policy statement on 'Special Use Airspace – Safety Buffer Policy for Airspace Design Purposes' has been applied.	N/A – this proposal does not change any existing/ introduce new buffers.
e	Supporting information on traffic data including statistics and forecasts for the various categories of aircraft movements (passenger, freight, test and training, aero club, other) and terminal passenger numbers	This proposal would have no impact on airspace usage - see Sections 4.2 and 6.2.
f	Analysis of the impact of the traffic mix on complexity and workload of operations	This proposal would have no impact on the traffic mix - see Sections 4.2 and 6.2.
g	Evidence of relevant draft Letters of Agreement, including any arising out of consultation and/or airspace management requirements	N/A – this proposal does not change any existing/ introduce new LoAs; cross-border elements are not impacted.
h	Evidence that the airspace design is compliant with ICAO Standards and Recommended Practices (SARPs) and any other UK policy or filed differences, and UK policy on the Flexible Use of Airspace (or evidence of mitigation where it is not)	STAR Replication policy and PANS-OPS compliance – see NATS design report (Ref 7).
i	The proposed airspace classification with justification for that classification	No change to existing airspace classification.
j	Demonstration of commitment to provide airspace users equitable access to the airspace as per the classification and where necessary indicate resources to be applied or a commitment to provide them in line with forecast traffic growth. 'Management by exclusion' would not be acceptable	N/A - this proposal does not change any existing/ introduce new airspace user access.
k	Details of and justification for any delegation of ATS	No change to the delegation of ATS.

10. Safety Assessment

10.1 There is an overriding safety Design Principle for the proposed changes which states that safety should be at least maintained, or improved, as an impact of the changes.

10.2 The safety of the IFP changes has been assured by NATS Design who have worked alongside the CAA SARG IFP Regulator.

10.3 Prior to implementation, NATS will also undertake a formal Hazard Analysis in order to prove that the proposed changes are safe to be implemented into the operational environment.

10.4 The Option 2 concept would take full account of existing usage and connectivity needs. It would ensure that all IFPs are designed and checked by a suitably qualified Approved Procedure Designer (APD), as regulated by CAA SARG.

10.5 There would be a qualitative improvement in safety because each remaining IFP would use improved navigation specifications and be defined in an official manner. Today's conventional IFPs are known to be flown using Flight Management System (FMS) overlays, which are not state regulated in the same way.

10.6 Where STARs have been extended and/or additional STARs established as part of this proposal to ensure important Descent Planning levels are maintained as per today, we have ensured that appropriate and safe connectivity is still provided, by identifying common route segments which can be used, which replicates procedures flown today. These will also be assessed as part of the safety hazard analysis, mentioned above in 10.3.

10.7 Therefore, there would be a positive impact on safety whilst also improving the overall network connectivity. This is dependent on the satisfactory completion of the hazard analysis.

11. Operational Impact

	An analysis of the impact of the change on all airspace users, airfields and traffic levels must be provided, and include an outline concept of operations describing how operations within the new airspace will be managed. Specifically, consideration should be given to:	Evidence of compliance/ proposed mitigation
a	Impact on IFR general air traffic and operational air traffic or on VFR General Aviation (GA) traffic flow in or through the area	No impact to air traffic (technical change only) – see Sections 7.5 - 7.6.
b	Impact on VFR operations (including VFR routes where applicable);	No impact on VFR operations. See Section 7.5 -7.6.
c	Consequential effects on procedures and capacity, i.e. on SIDs, STARs, and/or holding patterns. Details of existing or planned routes and holds	No impact on procedures or capacity (technical change only) - see Section 6.2.
d	Impact on aerodromes and other specific activities within or adjacent to the proposed airspace	No impact on aerodromes or other relevant activities – see Section 7.2.
e	Any flight planning restrictions and/or route requirements	No impact – technical changes only.

12. Supporting Infrastructure/ Resources

	General requirements	Evidence of compliance/ proposed mitigation
a	Evidence to support RNAV and conventional navigation as appropriate with details of planned availability and contingency procedures	N/A – current RNAV5 coverage is demonstrably adequate.
b	Evidence to support primary and secondary surveillance radar (SSR) with details of planned availability and contingency procedures	Traffic uses the same regions as today in a similar manner from a surveillance point of view. Demonstrably adequate for the region.
c	Evidence of communications infrastructure including R/T coverage, with availability and contingency procedures	Traffic uses the same regions as today in a similar manner from a communications infrastructure point of view. Demonstrably adequate for the region.
d	The effects of failure of equipment, procedures and/or personnel with respect to the overall management of the airspace must be considered	Existing contingency procedures based on the conventional navigation BCN DVOR would no longer be required and will be withdrawn. RNAV replication removes the en-route dependency from the BCN DVOR. Other existing contingency procedures and management protocol will continue to apply as today.
e	Effective responses to the failure modes that will enable the functions associated with airspace to be carried out including details of navigation aid coverage, unit personnel levels, separation standards and the design of the airspace in respect of existing international standards or guidance material	As above (12d).
f	A clear statement on SSR code assignment requirements	No change to SSR code allocation.
g	Evidence of sufficient numbers of suitably qualified staff required to provide air traffic services following the implementation of a change	No training or additional qualifications required.

13. Airspace and Infrastructure

	General requirements	Evidence of compliance/ proposed mitigation
a	The airspace structure must be of sufficient dimensions with regard to expected aircraft navigation performance and manoeuvrability to fully contain horizontal and vertical flight activity in both radar and non-radar environments	As today - no proposed changes to the airspace structure (technical changes only). See Section 6.2.

b	Where an additional airspace structure is required for radar control purposes, the dimensions shall be such that radar control manoeuvres can be contained within the structure, allowing a safety buffer. This safety buffer shall be in accordance with agreed parameters as set down in CAA policy statement 'Safety Buffer Policy for Airspace Design Purposes Segregated Airspace'. Describe how the safety buffer is applied, show how the safety buffer is portrayed to the relevant parties, and provide the required agreements between the relevant ANSPs/ airspace users detailing procedures on how the airspace will be used. This may be in the form of Letters of Agreement with the appropriate level of diagrammatic explanatory detail.	As today - no proposed changes to the airspace structure (technical changes only).
c	The Air Traffic Management system must be adequate to ensure that prescribed separation can be maintained between aircraft within the airspace structure and safe management of interfaces with other airspace structures	As today - no proposed changes to the existing airspace structure (technical changes only).
d	Air traffic control procedures are to ensure required separation between traffic inside a new airspace structure and traffic within existing adjacent or other new airspace structures	As today – no proposed changes to the existing ATC procedures.
e	Within the constraints of safety and efficiency, the airspace classification should permit access to as many classes of user as practicable	As today - no proposed changes to existing airspace classifications.
f	There must be assurance, as far as practicable, against unauthorised incursions. This is usually done through the classification and promulgation	As today– no proposed changes to airspace classification or volume.
g	Pilots shall be notified of any failure of navigational facilities and of any suitable alternative facilities available and the method of identifying failure and notification should be specified	Existing contingency procedures would continue to apply.
h	The notification of the implementation of new airspace structures or withdrawal of redundant airspace structures shall be adequate to allow interested parties sufficient time to comply with user requirements. This is normally done through the AIRAC cycle	No proposed new structures and all changes will be promulgated through the AIRAC cycle.
i	There must be sufficient R/T coverage to support the Air Traffic Management system within the totality of proposed controlled airspace	No change from today's Controlled Airspace. R/T coverage demonstrably adequate as per current day.
j	If the new structure lies close to another airspace structure or overlaps an associated airspace structure, the need for operating agreements shall be considered	No proposed new structures.
k	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 air traffic control procedures can be devised, the change sponsor shall act to resolve any conflicting interests	No proposed new airspace structures.

	ATS route requirements	Evidence of compliance/ proposed mitigation
a	There must be sufficient accurate navigational guidance based on in-line VOR/DME or NDB or by approved RNAV derived sources, to contain the aircraft within the route to the published RNP value in accordance with ICAO/ Eurocontrolstandards	RNAV5 navaid coverage is demonstrably adequate. DME coverage is adequate and demonstrated in the coverage plots in Reference 6.
b	Where ATS routes adjoin terminal airspace there shall be suitable link routes as necessary for the ATM task	As today – there are no new link routes required as part of this proposal.
c	All new routes should be designed to accommodate P-RNAV navigational requirements	Confirmed - RNAV5 specification will be used.

	Terminal airspace requirements	Evidence of compliance/ proposed mitigation
a	The airspace structure shall be of sufficient dimensions to contain appropriate procedures, holding patterns and their associated protected areas	As today - no proposed changes to the airspace structure.
b	There shall be effective integration of departure and arrival routes associated with the airspace structure and linking to designated runways and published instrument approach procedures (IAPs)	As today - no proposed changes to the airspace structure.
c	Where possible, there shall be suitable linking routes between the proposed terminal airspace and existing en-route airspace structure	As today - the revised STARs will end in the same locations as they do currently.
d	The airspace structure shall be designed to ensure that adequate and appropriate terrain clearance can be readily applied within and adjacent to the proposed airspace	As today - no change to the airspace structure.
e	Suitable arrangements for the control of all classes of aircraft (including transits) operating within or adjacent to the airspace in question, in all meteorological conditions and under all flight rules, shall be in place or will be put into effect by the change sponsor upon implementation of the change in question (if these do not already exist)	As today - no change to the airspace structure.
f	The change sponsor shall ensure that sufficient visual reference points are established within or adjacent to the subject airspace to facilitate the effective integration of VFR arrivals, departures and transits of the airspace with IFR traffic	As today - no change to visual reference points.
g	There shall be suitable availability of radar control facilities	As today - no change to radar control facilities.

h	The change sponsor shall, upon implementation of any airspace change, devise the means of gathering (if these do not already exist) and of maintaining statistics on the number of aircraft transiting the airspace in question. Similarly, the change sponsor shall maintain records on the numbers of aircraft refused permission to transit the airspace in question, and the reasons why. The change sponsor should note that such records would enable ATS managers to plan staffing requirements necessary to effectively manage the airspace under their control	As today - there are no proposed changes to the airspace structure.
i	All new procedures should, wherever possible, incorporate Continuous Descent Approach (CDA) profiles after aircraft leave the holding facility associated with that procedure	As today – no new procedures.

	Off-route airspace requirements	Evidence of compliance/ proposed mitigation
	There are no proposed changes to off-route airspace structures	

14. Environmental Assessment

	Theme	Content	Evidence of compliance/ proposed mitigation
a	WebTAG analysis	Output and conclusions of the analysis (if not already provided elsewhere in the proposal)	N/A – no change in CO_2, fuel or noise impacts. See Section 7.7.
b	Assessment of noise impacts (Level 1/M1 proposals only)	Consideration of noise impacts, and where appropriate the related qualitative and/or quantitative analysis If the change sponsor expects that there will be no noise impacts, the rationale must be explained	N/A – this is a Level 2C change.
c	Assessment of CO_2 emissions	Consideration of the impacts on CO_2 emissions, and where appropriate the related qualitative and/or quantitative analysis If the change sponsor expects that there will be no impact on CO_2 emissions impacts, the rationale must be explained	N/A – no change in CO_2 or fuel impacts. See Section 7.7.
d	Assessment of local air quality (Level 1/M1 proposals only)	Consideration of the impacts on local air quality, and where appropriate the related qualitative and/or quantitative analysis If the change sponsor expects that there will be no impact on local air quality, the rationale must be explained	N/A – this is a Level 2C change.

e	Assessment of impacts upon tranquillity (Level 1/M1 proposals only)	Consideration of any impact upon tranquillity, notably on Areas of Outstanding Natural Beauty or National Parks, and where appropriate the related qualitative and/or quantitative analysis If the change sponsor expects that there will be no tranquillity impacts, the rationale must be explained	N/A – this is a Level 2C change.
f	Operational diagrams	Any operational diagrams that have been used in the consultation to illustrate and aid understanding of environmental impacts must be provided	See the Assessment Meeting slide pack (Ref 2). No change to environmental impacts, as covered in Section 7.7
g	Traffic forecasts	10-year traffic forecasts, from the anticipated date of implementation, must be provided (if not already provided elsewhere in the proposal)	No foreseeable changes to capacity or usage - see Section 4.2.
h	Summary of environmental impacts and conclusions	A summary of all of the environmental impacts detailed above plus the change sponsor's conclusions on those impacts	No foreseeable environmental impact - see Section 7.7.

14.1 Reversion Statement

Should the proposal be approved and implemented, reversion to the pre-implementation state would only be possible if the conventional navaids are kept in operation. Once the navaids are removed it would not be possible to revert to the pre-implementation state.

The BCN DVOR is scheduled to be decommissioned and physically removed in 2022 or sooner if all aerodrome dependencies are removed before then.

In the unlikely event that there are unexpected issues caused by this proposal, then short notice changes could be made via NOTAM or by adding Route Availability Document (RAD) restrictions. For a permanent reversion, the changes would have to be reversed by incorporating this into an appropriate future AIRAC date. Due to the limitations of NATS Area System (NAS - flight and radar data processing) large scale airspace changes are usually only implemented four times a year.

15. Appendices

15.1 References

Ref No	Name	Hyperlink
1	BCN DVOR Statement of Need V2	Link
2	BCN DVOR Stage 1 Assessment Meeting Slides V1.0	Link
3	BCN DVOR Stage 1B Document V1.1	Link
4	BCN DVOR Stage 2 Document V1.2	Link
5	BCN DVOR Stage 3 Document V1.0	Link
6	AIP changes in support of BCN DVOR Airspace Change Proposal V1.0	Supplied directly to CAA
7	NATS Design Ltd. BCN DVOR Design Report (IFP Report) V3.0	Supplied directly to CAA
8	SARG Policy: Policy for the replication of conventional SIDs, STARs and Holds using PBN	Link
9	BCN DVOR Removal – Engagement Evidence (redacted)	Link

15.2 Statement of Need (V2) for BCN DVOR ACP (ACP-2019-069)

In order to facilitate the eventual removal of the Brecon (BCN) DVOR, it is proposed to remove the enroute dependency from this facility. Any STARs that use this facility and not changed by previous DVOR removals will either be dis-established or made RNAV5 and designated by their start point in accordance with ICAO.

Where an important Descent Planning level would be removed by conforming to RNAV design criteria, some STARs may be extended, or new ones established to ensure that these levels remain in the AIP and on the STAR charts. Any alternate STARs and Holds will be removed.

In the event that the removal of the dependency results in truncation/ rationalisation of existing STARs, then any portions of those STARs will be replaced by an ATS Route or DCT.

As part of this proposal NATS will take the opportunity to RNAV any remaining Cardiff and Bristol STARs; whether dependent on the BCN DVOR or not and designate them in accordance with ICAO.

Finally, some of the Cardiff and Bristol STARs are likely to change significantly as part of a future NERL network change and will therefore not be RNAV replicated under this proposal. However, they will be re-designated in accordance with ICAO as part of this proposal

15.3 Impact assessment: Bristol Procedures

For charts and technical notes, see the Assessment Meeting slide pack [Ref 2] for the current IFPs. Procedures shown as greyed out are being withdrawn. All Bristol STARs in this work package will end at FL70 and with a speed limit of 220KIAS. This compliments the BRI Hold speed at FL70.

Current IFP	Current route connectivity/ STAR	Design Principle	How	Proposed route Connectivity/ STAR	Impact of proposed change on connectivity and flight behaviour
BRI 1A STAR	*RETSI - AMRAL - RILES - DOBEM - INGUR - BRI*	Satisfies all DPs except DP4 is not relevant for this change (no BCN dependency to remove)	RNAV5 replication, truncation and re-naming	N862: *AMRAL - RILES - DOBEM - INGUR - BRI* Re-named as **AMRAL 1B**	The conventional STAR will be RNAV5 replicated, truncated to start at existing waypoint *AMRAL* - where the first descent planning restriction of FL160 is - and re-named. The rest of the waypoints are the same as the existing conventional procedure. This proposal will amend the level at *RILES* to "*at FL150*", following operator feedback. Currently, on first contact with radar the instruction given is to descend to FL150; but the FMS shows FL160, which creates additional workload and uncertainty. Amending it to FL150 will remove this ambiguity. The base of this procedure is FL70 and the final waypoint *BRI* has an "*at FL70*" level restriction. STAR to be re-named based on its new starting waypoint *AMRAL* and the 'B' designator used to denote the destination airport (Bristol). The STAR will be replicated and created using RNAV design criteria to align as closely as possible with the existing routeing.
BRI 1E STAR	*TALGA - BCN - BRI*	Satisfies all 5 DPs	RNAV5 replication, STAR extension and re-naming	N864: *UMOLO - TALGA - BCN - PEGZA - BRI* Re-named as **UMOLO 1B**	The conventional STAR will be RNAV5 replicated, extended back to start at existing waypoint *UMOLO* (along N864) and re-named. Extending the STAR back to *UMOLO* will provide flight plannable options and retain the important descent planning restriction. The current level restriction of FL160 10NM before

Current IFP	Current route connectivity/ STAR	Design Principle	How	Proposed route Connectivity/ STAR	Impact of proposed change on connectivity and flight behaviour
					TALGA, for the conventional procedure, equates to the location of *UMOLO*. The base of this procedure is FL70 and the final waypoint *BRI* has an "*at FL70*" level restriction. A new waypoint is required between *BCN* and *BRI* (5LNC *PEGZA* has been reserved) to incorporate the existing "*MAX 250KIAS*" SLP. STAR to be re-named based on its new starting waypoint *UMOLO* and the 'B' designator used to denote the destination airport (Bristol). The STAR will be replicated and created using RNAV design criteria to align as closely as possible with the existing routeing.
BRI 1B STAR	*STU - AMMAN - BCN - BRI*	Satisfies all 5 DPs	RNAV5 replication, truncation and re-naming	L9: *FIFAH - AMMAN - BCN - PEGZA - BRI* Re-named as **FIFAH 1B**	The conventional STAR will be RNAV5 replicated, truncated to start at new waypoint *FIFAH* (5LNC has been reserved) - where the first descent planning restriction of "*at FL170*" is - and re-named. Waypoint *STU* will eventually be removed anyway as it is a VOR. The rest of the waypoints are the same as the existing conventional procedure. The base of this procedure is FL70 and the final waypoint *BRI* has an "*at FL70*" level restriction. New waypoint required between *BCN* and *BRI* (5LNC *PEGZA* has been reserved) to incorporate the existing "*MAX 250KIAS*" SLP.

Current IFP	Current route connectivity/ STAR	Design Principle	How	Proposed route Connectivity/ STAR	Impact of proposed change on connectivity and flight behaviour
					STAR to be re-named based on its new starting waypoint *FIFAH* and the 'B' designator used to denote the destination airport (Bristol). The STAR will be replicated and created using RNAV design criteria to align as closely as possible with the existing routeing.
BRI 1C STAR	*CPT - POMAX - BRI*	Satisfies DP1, DP2 and DP5 – no RNAV replication (DP3) and no BCN dependency to remove (DP4)	Re-naming	*CPT - POMAX - BRI* Re-named as CPT 1B	STAR to be re-named based on its starting waypoint *CPT* and the 'B' designator used to denote the destination airport (Bristol). No further changes will be made as this STAR is likely to change as part of a future NERL network change.
BRI 2D STAR	*BHD - TINAN - TIVER - EXMOR - BRI*	Satisfies all DPs except DP4 is not relevant (no BCN dependency to remove)	RNAV5 replication, truncation and re-naming	N864: *DAWLY - TIVER - EXMOR - BRI* Re-named as DAWLY 1B	The conventional STAR will be RNAV5 replicated, truncated to start at existing waypoint *DAWLY* – enabling more flight planning options - and re-named. *DAWLY* is not published on the current STAR but is on the route N864 between *BHD* and *TIVER*. *TINAN* will also be removed from the STAR. The rest of the waypoints are the same as the existing conventional procedure. The base of this procedure is FL70 and the final waypoint *BRI* has an "*at FL70*" level restriction. STAR to be re-named based on its new starting waypoint *DAWLY* and the 'B' designator used to denote the destination airport (Bristol).

Current IFP	Current route connectivity/ STAR	Design Principle	How	Proposed route Connectivity/ STAR	Impact of proposed change on connectivity and flight behaviour
					The STAR will be replicated and created using RNAV design criteria to align as closely as possible with the existing routeing.
BRI Hold	N/A	Satisfies DP1. DP2 and DP3 – no BCN dependency to remove (DP4) and no further changes proposed (DP5)	RNAV5 replication	N/A	This Hold will be RNAV replicated, to match as closely as possible with the currently published conventional Hold. The RNAV Hold BRI will have a "*MAX 185KIAS*" speed limit below FL70; and "*MAX 220KIAS*" speed limit at FL70 and above. On low pressure days FL70 will not be available for holding. The proposed levels and associated speeds ensure that the track over the ground will not change below 7,000ft.
ADVED 1A STAR	*EXMOR - ADVED*	DP5 only – no BCN dependency to remove	Re-naming	*EXMOR - ADVED* Re-named as **EXMOR 1Q**	The ADVED 1A STAR is an existing RNAV1 STAR and features on the same chart as the BRI DVOR. It will be re-named as part of this proposal based on its starting waypoint *EXMOR* and the 'Q' designator used to differentiate from the below EXMOR 1B STAR. No further changes proposed and no impact.
BAXUN 1A STAR	*EXMOR - ROTLU - BAXUN*	DP5 only – no BCN dependency to remove	Re-naming	*EXMOR - ROTLU - BAXUN* Re-named as **EXMOR 1B**	The BAXUN 1A STAR is an existing RNAV1 STAR and features on the same chart as the BRI DVOR. It will be re-named as part of this proposal based on its starting waypoint *EXMOR* and the 'B' designator used to denote the destination airport (Bristol). No further changes proposed and no impact.

15.4 Impact assessment: Cardiff Procedures

For charts and technical notes, see the Assessment Meeting slide pack (Ref 2) for the current IFPs. Procedures shown as greyed out are being withdrawn. All Cardiff STARs in this work package will end at FL70 and with a speed limit of 220KIAS. This compliments the CDF Hold speed at FL70.

Current IFP	Current route connectivity/ STAR	Design Principle	How	Proposed route Connectivity/ STAR	Impact of proposed change on connectivity and flight behaviour
CDF 1A STAR	*RETSI - AMRAL - RILES - DOBEM - KUKIS - CDF*	Satisfies all DPs except DP4 is not relevant (no BCN dependency to remove) Bistro	RNAV5 replication, truncation and re-naming	N862: *AMRAL - RILES - DOBEM - KUKIS - CDF* Re-named as **AMRAL 1C**	The conventional STAR will be RNAV5 replicated, truncated to start at existing waypoint *AMRAL* – where the first descent planning level of FL160 is - and re-named. The rest of the waypoints are the same as the existing conventional procedure. This proposal will amend the level at *RILES* to "*at FL150*", following operator feedback. Currently, on first contact with radar the instruction given is to descend to FL150; but the FMS shows FL160, which creates additional workload and uncertainty. Amending it to FL150 will remove this ambiguity. The base of this procedure is FL70 and the final waypoint *CDF* has an "*at FL70*" level restriction. STAR to be named based on its new starting waypoint *AMRAL* and the 'C' designator used to denote the destination airport (Cardiff). The STAR will be replicated and created using RNAV design criteria to align as closely as possible with the existing routeing.
CDF 1E STAR	*TALGA - BCN - CDF*	Satisfies all 5 DPs	RNAV5 replication, STAR extension and re-naming	N864: *UMOLO - TALGA - BCN - CDF* Re-named as **UMOLO 1C**	The conventional STAR will be RNAV5 replicated, extended back to start at existing waypoint *UMOLO* (along N864) and re-named. The rest of the waypoints are the same as the existing conventional procedure. Extending the STAR back to *UMOLO* will provide flight plannable options and retain the important descent planning restriction. The current level restriction of FL160 10NM before *TALGA*, for the conventional procedure, equates to the location of *UMOLO*. The base of this procedure is FL70 and the final waypoint *CDF* has an "*at FL70*" level restriction.

Current IFP	Current route connectivity/ STAR	Design Principle	How	Proposed route Connectivity/ STAR	Impact of proposed change on connectivity and flight behaviour
					STAR to be re-named based on its new starting waypoint *UMOLO* and the 'C' designator used to denote the destination airport (Cardiff). The STAR will be replicated and created using RNAV design criteria to align as closely as possible with the existing routeing.
CDF 1B STAR	*STU - AMMAN - BCN - CDF*	Satisfies all 5 DPs	RNAV5 replication, truncation and re-naming	L9: *FIFAH - AMMAN - BCN - CDF* Re-named as **FIFAH 1C**	The conventional STAR will be RNAV5 replicated, truncated to start at new waypoint *FIFAH* (5LNC has been reserved) – where the first descent planning restriction of FL170 is - and re-named. Waypoint *STU* will eventually be removed anyway as it is a VOR. The rest of the waypoints are the same as the existing conventional procedure. The base of this procedure is FL70 and the final waypoint *CDF* has an "*at FL70*" level restriction. STAR to be re-named based on its new starting waypoint *FIFAH* and the 'C' designator used to denote the destination airport (Cardiff). The STAR will be replicated and created using RNAV design criteria to align as closely as possible with the existing routeing.
CDF 1C STAR	*CPT - ABDAL - BRI - CDF*	Satisfies DP1, DP2 and DP5 – no RNAV replication (DP3) and no BCN dependency to remove (DP4)	Re-naming	*CPT - ABDAL - BRI - CDF* Re-named as **CPT 1C**	STAR to be re-named based on its starting waypoint *CPT* and the 'C' designator used to denote the destination airport (Cardiff). No further changes will be made as this STAR is likely to change as part of a future NERL network change.

Current IFP	Current route connectivity/ STAR	Design Principle	How	Proposed route Connectivity/ STAR	Impact of proposed change on connectivity and flight behaviour
CDF 3D STAR	*BHD - TINAN - TIVER - EXMOR - CDF*	Satisfies all DPs except DP4 is not relevant (no BCN dependency to remove)	RNAV5 replication, truncation and re-naming	N864: *DAWLY - TIVER - IZLAW - EXMOR - CDF* Re-named as **DAWLY 1C**	The conventional STAR will be RNAV5 replicated, truncated to start at existing waypoint *DAWLY* – enabling more flight planning options - and re-named. *DAWLY* is not published on the STAR but is on the route N864 between *BHD* and *TIVER*. *TINAN* will also be removed from the STAR. The rest of the waypoints are the same as the existing conventional procedure. The base of this procedure is FL70 and the final waypoint *CDF* has an "*at FL70*" level restriction. A new waypoint is required between *TIVER* and *EXMOR* (5LNC *IZLAW* has been reserved) to incorporate the existing 250KIAS SLP. STAR to be re-named based on its new starting waypoint *DAWLY* and the 'C' designator used to denote the destination airport (Cardiff). The STAR will be replicated and created using RNAV design criteria to align as closely as possible with the existing routeing.
CDF Hold	N/A	Satisfies DP1. DP2 and DP3 – no BCN dependency to remove (DP4) and no further changes proposed (DP5)	RNAV5 replication	N/A	This Hold will be RNAV replicated, to match as closely as possible with the currently published conventional Hold. The RNAV Hold CDF will have a "*MAX 200KIAS*" speed limit below FL70; and "*MAX 220KIAS*" speed limit at FL70 and above. On low pressure days FL70 will not be available for holding. The proposed levels and associated speeds ensure that the track over the ground will not change below 7,000ft.

15.5 Engagement Activity

This section summarises the engagement activities we conducted, which influenced the design decisions/ considerations. Copies of the engagement material have been provided as supporting evidence (Ref 9).

Stakeholder	Type of engagement	Date	Notes
Bristol Airport	Email	July 2020	Emails outlining the proposed changes to Bristol Airport's procedures (STARs/ Hold) as part of the DVOR Rationalisation programme; seeking feedback and approval. Additional information on the use of Bristol's current procedure was also sought, such as typical holding altitudes.
Cardiff Airport	Email	July 2020	Emails outlining the proposed changes to Cardiff Airport's procedures (STARs/ Hold) as part of the DVOR Rationalisation programme; seeking feedback and approval. Additional information on the use of Cardiff's current procedure was also sought, such as typical holding altitudes.

Table 3: Engagement with Airports for BCN DVOR proposed changes

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