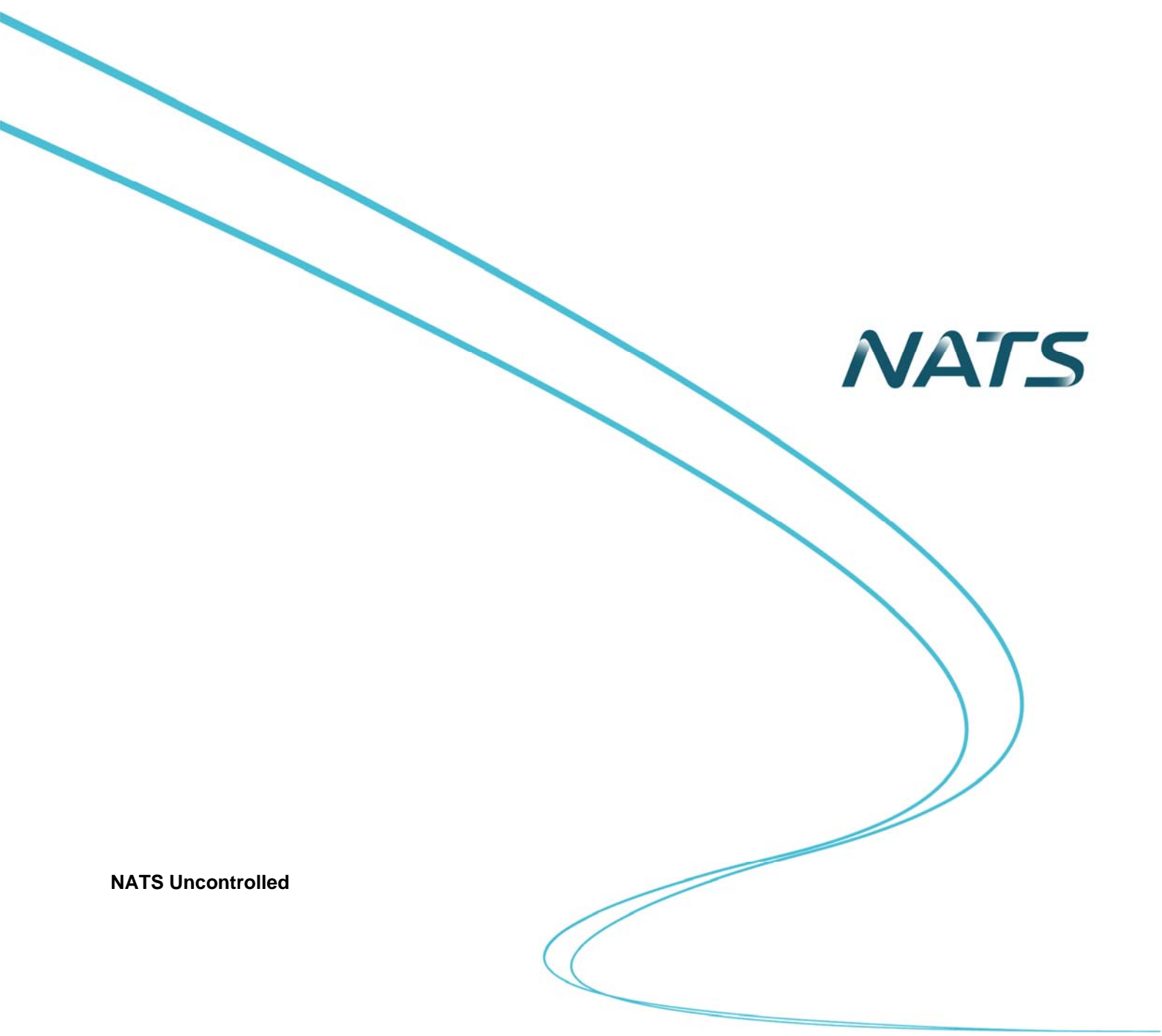


PLAS FASIN

**Doncaster STARs
CAP1616 Stages 1-4 Multi-Gateway**

NATS

NATS Uncontrolled



Action	Position	Date
Produced	Airspace Change Assurance, NATS Future Airspace & ATM	26/06/18
Approved	ATC Lead – Airspace, NATS Prestwick ATM Development	26/06/18
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Introduction

This document continues the CAP1616 process started under DAP1916 ref 547 (February 2018).

This proposal is for the RNAV replication of existing Doncaster (EGCN) conventional STARs to RNAV1 standard. This will remove dependence on the GMA VOR which is due to be decommissioned under the NATS VOR rationalisation programme. This is in alignment with the EGCN SID replication which is being conducted by Doncaster Airport.

The intent of this document is to summarise and satisfy the requirements of CAP1616 Stages 1-4.

Brief Summary of this proposal

This document is limited to the replication of the following STARs.

Extant Conventional STAR	Proposed RNAV STAR designator
EGCN FNY 1A	EGCN CALDA 1D
EGCN FNY 1B	EGCN SETEL 1D
EGCN FNY 1C	EGCN GASKO 1D
EGCN FNY 2D	EGCN EMBOR 1D
EGCN FNY 1E	EGCN TRENT 1D
EGCN FNY 1F	EGCN REXAM 1D
EGCN FNY 1G	EGCN WAL 1D

The scope is limited to the above standard instrument arrival routes (STARs).

Airport-based procedures such as standard instrument departures (SIDs) and instrument approaches are not relevant to the enroute scope of this proposal, hence they are excluded. Doncaster Sheffield Airport is developing separately their proposal for RNAV replication of SIDs.

This document will identify existing conventional STAR connectivity relevant to GAM; design principles on how that connectivity would be replaced by RNAV procedures; option concepts for those replacements; an evaluation of those option concepts against the design principles; and finally a full list of the specific changes.

It will also describe the predicted impact of those changes on flight-paths. There would be no change in fuel/CO₂/greenhouse gas emissions due to this proposal, because there would be no change to lateral or vertical tracks. Similarly there would be no change to fuel uplift.

CAA's updated PBN STAR Replication Policy for Conventional STAR Replacement was published on 23rd March 2018, and was used as the basis for this proposal. PBN STAR Replication is defined as a PBN redesign of an existing conventional STAR from the commencement of the STAR in the ATS enroute network to the termination point (normally in the terminal environment) without introducing any change to track over the ground. Replication will not change existing traffic patterns, and it is expected that the replication will cause no change in environmental impact subject to an assessment. This document assesses the environmental impacts and provides brief evidence statements in support.

In the following document, the phrase 'No predicted change to flight behaviour' is used. In context it means there would be no change to pilot or controller behaviour (apart from technical designation changes), and no change to lateral or vertical traffic dispersion.

1. Stage 1 Define

Step 1A Assess requirement

- 1.1 The statement of need (CAA DAP1916 ref 547) was submitted in February 2018.
- 1.2 The CAA has been briefed by telephone and email correspondence.
- 1.3 This proposal is primarily about the removal of dependencies from the EGCN enroute flight procedures, dependent on the GAM DVOR, and the option concepts as to how this may be achieved.
- 1.4 The flight procedures under consideration are all EGCN STARs.
- 1.5 CAA has agreed that this proposal falls under the airspace change process, with a draft level of 2C.

Step 1A complete

Step 1B Design principles

- 1.6 In line with current CAA policy, new STAR designators should now be in line with standard ICAO method – named after the first waypoint of the procedure (as opposed to the final waypoint as has been the practice previously for UK designations).
- 1.7 The main design principle (D0), with overriding priority, is that the proposed technical changes to definitions of STARs/holds would not result in a change to flight trajectories – laterally, vertically or in dispersal.
- 1.8 The other design principles for this proposal are:

Design Principle	Description
DP1 Admin	Remove references to the GAM VOR which are not material to the procedure
DP2 Replicate	PBN Replication – replace conventional STARs with RNAV STARs
DP3 Technical amendment	Minor changes to a STAR which currently cannot be flown as it is formally defined, for legacy reasons – these changes always reflect what would actually happen in practical terms.

Three other DPs were considered and discarded as not appropriate for use. DP4 was to use FMS overlays to allow continued “conventional” STAR use. DP5 was to truncate STARs. DP6 was to initiate a complete redesign of the STARs. None of these have been included in this proposal, following CAA engagement, and are mentioned here only for completeness.

Engagement with stakeholders in the development of the Design Principles was done via the Airline Lead Operator Carrier Panel. The design principles were agreed at the December 2017 meeting of the Lead Operator Carrier Panel (12th Dec 2017).

The three DPs summarised above are detailed below:

1.9 DP1 Admin – details of intent, example method

Removes unnecessary references to VORs. Some conventional AIP STAR plates may contain references to a VOR which is not actually used in the IFP itself. Assess the impact of removing that reference.

Make an administrative change – no change to STAR version number.

1.10 DP2 Replicate – details of intent, example method

Replicate the current IFPs using CAA PBN STAR Replication Policy (Mar 2018). Assess the impact of changing the navigation status.

Example: All EGCN STARs can be replicated from conventional navigation to RNAV1 specification.

Method: Employ an Approved IFP Designer (APD) to analyse the existing conventional STAR. The APD is instructed to use appropriate RNAV criteria to draw up replacements, following the same track over the ground and vertical definitions.

Desired Outcome: Replication of STARs under this policy means there would be no change to tracks over the ground, purely technical changes to the definitions of the IFPs.

1.11 DP3 Technical Amendment – details of intent, example method

Technical amendments could be used to correct any existing IFP technical issue, which are worked around in practice, or correct an existing flight plan disconnection, which is also worked around in practice. Assess the impact of correcting an existing error to match the actual workaround.

For the EGCN STARs there were no technical corrections required.

Step 1B complete

2. Stage 2 Develop and Assess

Step 2A Options development

- 2.1 Airspace change design options: The design concepts considered were limited as follows.
Option 0 – Do nothing. Retain all the conventional STARs unchanged from today's AIP definition.
Option 1 – Using the CAA policy, replicate the STARs using RNAV1, exactly as defined in the AIP.

- 2.2 Option 0 – Do nothing. Retain all the STARs/holds unchanged from today's AIP definition.

Option 0	REJECT		
Description of option			
This is the current scenario. No change to existing AIP definitions of STARs/holds.			
Design principle 0: No change to flight behaviours	NOT MET	PARTIAL	MET
Summary of qualitative assessment			
No change. Does not remove any enroute flight dependency from DVORs.			
Design principle 1: Administrative change	NOT MET	PARTIAL	MET
Summary of qualitative assessment			
No change. Does not remove any enroute flight dependency from DVORs.			
Design principle 2: Replicate using RNAV Replication policies	NOT MET	PARTIAL	MET
Summary of qualitative assessment			
No change. Does not remove any enroute flight dependency from DVORs.			
Design principle 3: Technical amendment	NOT MET	PARTIAL	MET
Summary of qualitative assessment			
No change. Does not remove any enroute flight dependency from DVORs.			

- 2.3 Option 1 – Replicate each STAR/Hold exactly as defined

Option 1	ACCEPT and PROGRESS		
Description of option			
All IFPs would be replicated exactly as defined in the current AIP. No changes would be made to the STARs to accommodate RNAV1 recommended min segment lengths.			
Design principle 0: No change to flight behaviours	NOT MET	PARTIAL	MET
Summary of qualitative assessment No practical change to connectivity, no change to lateral/vertical track patterns.			
Design principle 1: Administrative change	NOT MET	PARTIAL	MET
Summary of qualitative assessment Would not occur under this Option			
Design principle 2: Replicate using RNAV Replication policies	NOT MET	PARTIAL	MET
Summary of qualitative assessment Would satisfy this DP. Would purely replace like for like, including route segment duplications etc.			
Design principle 3: Technical amendment	NOT MET	PARTIAL	MET
Summary of qualitative assessment Would not occur under this Option (not required)			

Step 2A complete

Step 2B Options appraisal

- 2.4 Using the options evaluation against design principles, we can rank the two concept options.
- 2.5 Option 0 Do Nothing – does not achieve the removal of dependencies from GAM. Rejected.
- 2.6 Option 1 Replicate as defined – this achieves the removal of dependencies from GAM. Accepted and progressed.

Option Appraisal (Option 1)

Group	Impact	Level of Analysis	Evidence
Communities	Noise impact on health and quality of life	Not applicable	Not applicable. The STAR replication will not change the trajectories of flights
Communities	Air quality	Not applicable	Not applicable – The changes are above 1,000ft, and will not change the trajectories of flights
Wider society	Greenhouse gas impact.	Monetise and quantify	This STAR replication does not change the flight trajectory of aircraft. The quantified monetary benefit will be zero
Wider society	Capacity/ resilience	Qualitative	Not applicable –no change
General Aviation	Access	Not applicable	Not applicable –no change
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Not applicable	Not applicable – this concept was not designed with the intention of increasing the capacity of this region of airspace.
General Aviation/ commercial airlines	Fuel burn	Monetise and quantify	This STAR replication does not change the flight trajectory of aircraft. The quantified monetary benefit will be zero
Commercial airlines	Training cost	Not applicable	Not applicable
Commercial airlines	Other costs	Fleet equipage analysis	The aircraft fleet operating from Doncaster has an RNAV1 equipage rate of 94% (Q1 2017). RNAV5 aircraft will flight plan using DCTs from the enroute network via the routes as detailed in EGCN AIP 2.22 Flight Procedures. There are no costs involved in this. RNAV5 aircraft will still be able to operate from EGCN.
Airport/ Air navigation service provider	Infrastructure costs	Monetise and quantify	None
Airport/ Air navigation service provider	Operational costs	Not applicable	Not applicable – this proposal would not lead to a change in operational costs.
Airport/ Air navigation service provider	Deployment costs	Monetise and quantify	Training Costs: negligible – notification via SI Delivery of change under AIRAC process: £5k NPV

- 2.7 Conclusion: The Option 1 concept best meets all the design principles. The shortlist comprises the Option 1 concept only. The Option 0 “Do nothing” option will not be progressed. There would be no change in fuel/CO₂/greenhouse gas emissions due to this proposal because there would be no change to lateral or vertical tracks. No fuel uplift changes will occur as a result of this proposal. There are no costs or benefits which could be reasonably monetised due to this proposal.

- 2.8 **Safety Assessment:** The Option 1 concept would take full account of existing usage and connectivity needs. All IFPs will be designed by an APD, as regulated by CAA SARG. There would be a qualitative improvement in safety because each remaining IFP would use improved navigation specifications and be formally promulgated in the AIP. Today's conventional IFPs are known to be flown using FMS RNAV overlays, which are not state-regulated.
- 2.9 Conclusion: There would be a positive impact on safety with no change to overall network connectivity.
- 2.10 **Catering for non RNAV1 equipped aircraft.** Non-RNAV1 equipped/capable aircraft would be catered for by using the routings as detailed in EGCN AIP 2.22 Flight Procedures. This table will be annotated to this effect.

AD 2-EGCN-14
26 Apr 2018

UNITED KINGDOM AIP

EGCN AD 2.22 FLIGHT PROCEDURES

1 Procedure for Inbound Aircraft

- (a) Standard arrival routes for aircraft inbound from the airways system will be routed via the Standard Terminal Arrival Routes (STARs) detailed at AD 2-EGCN-7-1 to AD 2-EGCN-7-3 and summarized below. Aircraft inbound from the airways system will be cleared into the CTR/CTA without having to request a specific entry clearance.

Inbound From	Via	Route	STAR Designator
North	P18 N57 L612	GASKO - BATLI - UPTON - FNY SETEL - POL - DENBY - UPTON - FNY CALDA - DENBY - UPTON - FNY	FNY 1A FNY 1B FNY 1C
East	Y70	OTBED - VEGUS - FNY	
South	N57/T420 N601	TNT - TIPIL - EVSON - ADELU - MAMUL - FNY EMBOR - EVSON - ADELU - MAMUL - FNY	FNY 1E FNY 2D
Southwest	N864	REXAM - BARTN - L975 - UPTON - FNY	FNY 1F
West	L975	WAL - UPTON - FNY	FNY 1G

End of Step 2B

3. Stage 3 Consult

Steps 3A-3D

- 3.1 Consultation and engagement is mainly about explaining differences in impacts, and how that may affect stakeholders. Due to the nature of the proposed change, the objective is replication with no change in aircraft trajectories.
- 3.2 There would be no impacts to people on the ground; hence consultation was not required. Impacts to aviation stakeholders are limited to RNAV equipage/ capability. This project is intended to be a technical piece of work, so there would be no noticeable impacts, leading to no material change to the current operation. Hence no consultation is required.
- 3.3 Engagement with aircraft operator stakeholders was undertaken by email, see Annex A. The practical impacts of Option 1 have been assessed and there are none, except for technical network improvements.
- 3.4 Full options appraisal: The options are unchanged from the Stage 2 options appraisal.
- 3.5 Engagement was undertaken with 8 stakeholders. Emails (as per Annex A) were sent to the following organisations.
- FlyBe
 - WizzAir
 - TUI
 - EasyJet
 - Excel Aviation
 - National Police Air Service
 - Doncaster Sheffield Flight Training
 - ATCSL

Three responses were received as summarised below. All responses supported the proposal. One stakeholder asked a question but did not subsequently submit a response/ give an opinion. . There was no request for conventional procedures to be maintained . However, NATS will continue to provide flight plan connectivity via the existing ATS route structure for those operators. This will be annotated within the AIP 2.22 and SRD.

Question	TUI	Police	FlyBe
1. On behalf of your organisation, do you support or object to, this proposal?	Support	Support	Support
2. Do you use the existing conventional STARs at Doncaster Airport?	Yes (though A,B,C & G very rarely...)	No	Yes
3. What percentage of your aircraft fleet (if applicable) are currently RNAV1 equipped?	All	100%	100%
4. If not all your aircraft are currently are RNAV1 equipped, by approximately what date would you expect that all your aircraft will be RNAV1 capable?	n/a	N/A	
5. Would you prefer that the conventional STARs remain in place for a transitional period, and if so for how long?	No	N/A	No preference
6. Please let us know if you have any comments (positive or negative) related to the introduction of RNAV1 replications of the conventional STARs. If this change is of no impact to you then please let us know since this in itself is useful feedback.	The only comment would be that we could "save the planet" if these STARs were streamlined, rather than just replicated , so saving many tons of CO2 emission.....	Fully supported as we may utilise in the future	No particular impact

No changes were made to the proposal as a result of feedback from this engagement.

End of Steps 3A-3D

4. Stage 4 Update and Submit

- 4.1 NATS Design (formerly known as Procedure Design Group) submitted a full data package for IFP Regulator analysis via the NATS-CAA ShareFile transfer service on 6th June 2018.
- 4.2 The replicated RNAV1 STARs are detailed in Ref 1.
- 4.3 The proposed EGCN RNAV STARs would replace their conventional-navigation equivalents, which would be withdrawn. There would be no change to communications coverage and no change to surveillance coverage which is demonstrably adequate. All ACP list items are covered by the phrase “no change”, except for navaid coverage. As part of the PDG data package (which is a technical piece of work not for publication), a report (Ref 1) was supplied, with full APD details of the proposed EGCN STARs including charts and coding tables.
- 4.4 Also attached is a report (Ref 3) illustrating DME/DME coverage, using the navaid analysis tool “DEMETER”. This report demonstrates multiple, redundant coverage, using the future rationalised navaid infrastructure.

5. Summary

- 5.1 This document details, the proposed RNAV EGCN STARs. It describes the current connectivity, the method used to progress the change, and the proposed connectivity.
- 5.2 The proposed connectivity remains entirely unchanged due to RNAV replication. Unchanged connectivity means unchanged routes, leading to unchanged flight behaviour and no change to traffic patterns over the ground.

6. Conclusion

- 6.1 We have assessed the impacts of making all the changes described in the tables above, and conclude that making these technical changes to the procedures would not alter traffic patterns. Aircraft operators who use Doncaster Sheffield Airport support the proposed change.

7. Annex A: email correspondence with aircraft operators

Email sent to 8 stakeholders on 7th March 2018:

Dear <customer Name>,
NATS is currently working with Doncaster Sheffield Airport to replicate in RNAV1, the existing seven conventional STARs in place at Doncaster Sheffield Airport.
In accordance with the CAA's STAR replication policy we are engaging with the airlines/aviation stakeholders who may be affected by the change.

Note the existing conventional STARs can be seen here:

[STARs via FNY NDB \(north\)](#)

[STARs via FNY NDB \(south\)](#)

[STARs via FNY NDB \(west/southwest\)](#)

The proposal is that these will be converted to RNAV1, which will not result in any change in flight paths.

As such could I please ask that you spend five minutes and answer the following brief questions.

Question	Answer
1. On behalf of your organisation, do you support or object to, this proposal?	Support / not bothered / oppose (delete as applicable)
2. Do you use the existing conventional STARs at Doncaster Airport?	
3. What percentage of your aircraft fleet (if applicable) are currently RNAV1 equipped?	
4. If not all your aircraft are currently are RNAV1 equipped, by approximately what date would you expect that all your aircraft will be RNAV1 capable?	
5. Would you prefer that the conventional STARs remain in place for a transitional period, and if so for how long?	
6. Please let us know if you have any comments (positive or negative) related to the introduction of RNAV1 replications of the conventional STARs. If this change is of no impact to you then please let us know since this in itself is useful feedback.	

We would greatly appreciate your response by the 31st March if possible.

Thank you for your time.

Best
regards

NATS Airspace Consultation

8. Annex B List of references

Reference	Title and description
1 Not for publication	<p><i>Doncaster Sheffield STARs Report v1.1</i></p> <p>This accompanies the IFP data pack supplied to CAA IFP Regulator for ICAO PANS-OPS compliance analysis.</p> <p>This is part of a technical piece of work in the context of IFP Regulation.</p> <p>It contains NATS IPR and is not expected to be published on the CAA's portal.</p> <p>It has not been redacted and its inclusion as a reference is to assist CAA analysis of this proposal.</p>
2 For publication	DME-DME coverage assessment (Doncaster area)

End of document