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Doncaster Sheffield Airport: Airspace Change Proposal

Proposal to introduce RNAV Standard Instrument Departure and Instrument Approach Procedures

PART A

Executive Summary

30th April 2018

CPJ-5237-RPT-169-V1

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Executive Summary

In this Airspace Change Proposal (ACP), Doncaster Sheffield Airport (DSA) proposes the introduction of aRea NAVigation (RNAV) Standard Instrument Departure (SID) procedures and RNAV Instrument Approach Procedures (IAPs) designed in accordance with current Civil Aviation Authority (CAA) policies. The adoption of the departure procedures (SIDs) requires an additional portion of controlled airspace for procedure containment to the east of DSA.

The CAA states in Civil Aviation Publication (CAP) 725[1] "CAA Guidance on the Application of the Airspace Change Process" that the introduction of, or changes to, SID procedures within controlled airspace constitutes an Airspace Change as defined in CAP725 and the change must be conducted in accordance with the Process detailed in CAP725. This formal change process has been followed for this ACP.

The Gamston VHF Omni-directional Radio Range (GAM VOR), the ground-based navigational aid upon which all the existing SIDs and Preferred Departure Routes (PDRs) are predicated, is being removed by NATS Services Ltd in 2019, as part of a national, CAA approved, rationalisation programme. To facilitate continuous operations for aircraft departing from DSA, it is necessary that the Airport replaces the existing departure procedures with new procedures not reliant on this aid. The proposed new SID procedures will be designed to meet modern Performance-Based Navigation (PBN) criteria aligned to the UK Future Airspace Strategy (FAS).

DSA propose that current conventional procedures be replaced with a suite of PBN SIDs based upon Global Navigation Satellite Systems (GNSS) with a navigation standard of RNAV-1. The proposed RNAV (GNSS) SID procedures have been designed to minimise the communities significantly affected by aviation noise whilst seeking to optimise the traffic flow from DSA. On withdrawal of the GAM VOR the existing conventional SID and PDR procedures will be withdrawn as the residual ground-based navigation infrastructure is inadequate to support these procedures. It is proposed that an Omni-Directional Departure (ODD) be implemented for each runway to accommodate those operators who are unable to fly GNSS-based procedures.

To meet the requirements of UK FAS and as a contingency for the unlikely event of Instrument Landing System (ILS) failure, DSA also propose the introduction of RNAV IAPs. The ILS will remain the primary means of instrument approach.

As part of the Future Airspace Strategy Implementation (North) (FASI (N)), DSA has worked closely with NATS En-route Limited (NERL) to ensure the proposals meet the satisfaction of ATM stakeholders. DSA has also conducted comprehensive engagement activities, culminating in a 13-week Stakeholder Consultation, with industry, communities and organisations who may be affected by the change. DSA has taken due regard of the responses received and this is summarised in the Post Consultation Report which forms part of this ACP submission.

[1] CAP725 was replaced by a new process CAP1616 in Jan 2018 but as this ACP was initiated under the CAP725 Process the CAA agreed that it would continue to be regulated under the CAP 725 process.

Abbreviations

Abbr.	In full
DSA	Doncaster Sheffield Airport
ACP	Airspace Change Proposal
AIP	Integrated Aeronautical Information Package
amsl	Above Mean Sea Level
ANSP	Air Navigation Service Provider
AONB	Area of Outstanding Natural Beauty
ATC	Air Traffic Control
ATM	Air Traffic Management
ATS	Air Traffic Services
BAP	Bickerdike Allen Partners
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CAT	Commercial Air Transport
DfT	Department for Transport
DME	Distance Measuring Equipment (a ground-based navigation aid)
FAS	Future Airspace Strategy
FMS	Flight Management Systems
ft	Feet
GA	General Aviation
GNSS	Global Navigation Satellite Systems (space-based navigation aids, e.g. GPS)
IAS	Indicated Air Speed
ICAO	International Civil Aviation Organisation
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
ILS	Instrument Landing System (a ground-based navigation aid)
INM	Integrated Noise Model
IRS/IRU	Inertial Reference System / Inertial Reference Unit
ISA	International Standard Atmosphere
KIAS	Knots-Indicated Airspeed

Abbr.	In full
MAP	Missed Approach Procedure
NAP	Noise Abatement Procedure
NATS	The en-route ANSP (Previously National Air Traffic Services)
NDB	Non-Directional Beacon (a ground based navigation aid)
NPR	Noise Preferential Route
NTK	Noise and Track Monitoring Equipment
ODD	Omni-Directional Departure
PC	Prestwick Centre (NERL)
PBN	Performance Based Navigation
RNAV	Area Navigation
RNP	Required Navigation Performance
RTF	Radio Telephony
SEL	Sound Exposure Level
SID	Standard Instrument Departure
TMA	Terminal Control Area
VOR	VHF Omni-Directional Radio Range (a ground-based navigation aid)

References

[1] CAP725 - CAA Guidance on the Application of the Airspace Change Process

[2] CAP778 - Design and Operation of Departure Procedures in UK Airspace

[3] CAP785 - Approval of Instrument Flight Procedures

[4] Department for Transport 'Guidance to the Civil Aviation Authority on Environmental Objectives Relating to the Exercise of its Air Navigation Functions' dated January 2014

[5] Department for Transport 'Air Navigation Guidance' dated October 2017

[6] CAA Policy Statement 'Controlled Airspace Containment Policy' dated 17 January 2014

[7] CAA Policy Statement 'Special Use Airspace – Safety Buffer Policy for Airspace Design Purposes' dated 22 August 2014

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Arrangement of the Documents

1. In this ACP we have tried to explain technical issues as clearly as possible so that those not familiar with the airspace and environmental arrangements pertaining to DSA and the surrounding airspace structure can understand how and why we have developed the proposed IFPs in the way we have.

2. It is necessary that the ACP documentation covers and explains several complex technical issues, both as they apply generally to DSA operations and as they have been applied in the context of each of the IFPs. Therefore, in order to make the ACP manageable, and to simplify access to the data, we have divided the document into five basic parts.

3. This is **Part A** of the ACP documentation, which is an introductory document. It contains the Executive Summary, an explanation of the arrangement of the ACP documentation, a list of abbreviations and acronyms used, a list of source reference documents, and a Contents Page covering the whole of the ACP documentation. It references the Confidentiality Statement that DSA has given to Consultees and the action to be taken should the CAA wish to place any documentation associated with this ACP into the public domain. It lists the documents that support, and are cross-referenced in, this ACP and which are submitted separately. Finally, it also includes a Glossary of Terms explaining some of the technical terminology used in the various ACP and supporting documents.

4. **Part B** of the ACP document details the Proposal itself and covers the justification for the proposal, operational and environmental aspects of the IFPs and their integration with the existing airspace arrangements. It outlines how the procedures have been designed and how they differ from the existing procedures. It outlines the existing Noise Abatement Procedures (NAPs) and Noise Preferential Routings (NPRs) in place at DSA for departing aircraft and the changes proposed.

5. In order that information is not unnecessarily duplicated and to keep the documentation manageable, **Part B** of the ACP relies heavily on, and cross-references to, the Stakeholder Consultation Document and the Report of the Stakeholder Consultation which support the ACP. The Stakeholder Consultation Document itself gives an overview and explains those aspects which are common to all the SID procedures. The Stakeholder Consultation Document itself is arranged in four parts and is supported by five technical annexes that detail individually each SID procedure from each runway. The technical annexes are separate documents for ease of reference and to simplify access to the details of each SID. The technical annexes detail the preferred design and configuration of each SID, the factors affecting the design, where the SID might differ from the historic SID or PDR, the other options considered in reaching the preferred design and any changes to the environmental impact of the proposed SID procedure.

6. **Part C** of the ACP document reviews the environmental data relating to the proposed SIDs in tabular format so that it can be separately validated against the CAA and DfT environmental guidance. **Part C** also cross-references to the Stakeholder Consultation Document and the Report of the Stakeholder Consultation and to other parts of the ACP.

7. In **Part D**, details are given about the conduct of the Consultation itself. Once again, it cross-references heavily to the Stakeholder Consultation Documents and also to the Report of the Stakeholder Consultation which is issued separately in support of this ACP and addresses issues raised by consultees.

8. Finally, in **Part E** we provide a Conclusion of the ACP together with a proposed implementation timetable.

Confidentiality

9. Throughout the development of this ACP, DSA has given a confidentiality statement to consultees that, other than the required submission of all correspondence to the CAA and use by our consultants, DSA would not disclose any personal details or content of individual responses to any third party.

10. The revised Edition of CAP725 published in March 2016 included a requirement that once a Regulatory Decision has been reached by the CAA then the formal proposal (which is understood to mean the inclusion of all correspondence and consultee responses which are required to be submitted as part of the ACP) will be published on the CAA website.

11. Should the CAA choose to place any of part of the documentation for or in support of this ACP into the public domain through the CAA website then all such documentation must be the depersonalised and redacted versions. **Note: A redacted version of the ACP is not included with the submission of this full ACP. A redacted version will be issued once the CAA has completed its consideration of ACP and reached a decision.**

Supporting Documents

12. The following documents are submitted separately by DSA in support of this ACP and are extensively cross-referenced in this ACP Document. The documents are given a Serial Number for ease of reference.

Serial	Event/Document	Document File Reference
1	Framework Briefing PowerPoint	CPJ-5237-PRE-012
2	Framework Briefing Notes	CPJ-5237-MIN-063
3	HAZID Brief	CPJ-5237-HAZ-014
4	HAZID Report	CPJ-5237-DOC-135
5	Focus Group PowerPoint	CPJ-5237-PRE-012
6	Equipage & Capability Survey Report	CPJ-5237-RPT-065
7	HAZID PowerPoint	CPJ-5237-PRE-067
8	Focus Group Notes - ATM	CPJ-5237-MIN-068
9	Focus Group Notes - Environment	CPJ-5237-MIN-069
10	Focus Group Notes - Operators	CPJ-5237-MIN-070
11	SID Flyability Assessment Plan	CPJ-5237-FT-071
12	Sponsor Consultation Document	CPJ-5237-DOC-134 or P272-6_DSA-ACP-consultation_LR
14	FAQs	CPJ-5237-DOC-139 or P272-2_DSA-ACP-FAQ_LR
15	Annex A to Part B of Sponsor Consultation Document	CPJ-5137-DOC-140 or P272-5_DSA-ACP-Annex-A_LR
16	Annex B to Part B of Sponsor Consultation Document	CPJ-5137-DOC-141 or P272-7_DSA-ACP-Annex-B_LR
17	Annex C to Part B of Sponsor Consultation Document	CPJ-5137-DOC-142 or P272-6_DSA-ACP-Annex-C_LR
18	Annex D to Part B of Sponsor Consultation Document	CPJ-5137-DOC-143 or P272-5_DSA-ACP-Annex-D_LR
19	Annex E to Part B of Sponsor Consultation Document	CPJ-5137-DOC-144 or P272-5_DSA-ACP-Annex-E_LR
20	Airspace Focus Group PowerPoint	CPJ-5237-PRE-149
21	ROGAG SID PowerPoint	CPJ-5237-PRE-150
22	LACC Update Brief PowerPoint	CPJ-5237-PRE-152
23	Airspace Focus Group Minutes	CPJ-5237-MIN-154
24	FASI(N) Brief PowerPoint	CPJ-5237-PRE-153

Serial	Event/Document	Document File Reference
26	LoA Consultation Briefing	CPJ-5237-PRE-161
27	ATM Minutes	CPJ-5237-MIN-162
28	LoA Minutes	CPJ-5237-MIN-163
29	Consultation Brief PowerPoint	CPJ-5237-PRE-167
30	Post Consultation Report	CPJ-5237-RPT-168
31	Airspace Change - Noise Assessment - BAP	A11077-R01C-DR DSA Airspace Change
32	Emissions Assessment - ERCD	Doncaster ACP Emissions Results_v3
33	Meeting notes - Rossington Town Council	15-Nov-17
34	Meeting notes - A member of the Public	15-Nov-17
35	Meeting notes - Hatfield Town Council	29-Nov-17
36	Meeting notes - Epworth Town Council	01-Nov-17
37	Meeting notes - Bawtry Town Council	08-Nov-17
38	Meeting notes - Doncaster Green Party	11-Dec-17
39	DSA ACC Meeting Minutes 16 Jan 17	CPJ-5237-MIN-015 V 1.0
40	Draft LoA between ATCSL and RAF Waddington	DSA - RAFW
41	Section 106 Agreement between Doncaster Finningley Airport and DMBC	L/DB/22/KW
42	DSA ACC Meeting Minutes 06/04/17	DSA ACC 06 04 17_Draft Minutes
43	Extraordinary NMESC Minutes 23/02/17	Extraordinary NMESC Minutes 23.02.17
44	ACP Submission Part A	CPJ-5237-RPT-169-ACP-PART A-V1
45	ACP Submission Part B	CPJ-5237-RPT-170-ACP-PART A-V1
46	ACP Submission Part C	CPJ-5237-RPT-171-ACP-PART A-V1
47	ACP Submission Part D	CPJ-5237-RPT-172-ACP-PART A-V1
48	ACP Submission Part E	CPJ-5237-RPT-173-ACP-PART A-V1

Glossary of Terms

Term	Explanation
A-weighted decibel dB(A)	Decibel (a unit of "loudness" of a sound), "A-weighted" (which matches the frequency response of the human ear).
Air Traffic Control Service (ATC)	A service provided for the purpose of preventing collisions between aircraft, and on the manoeuvring area between aircraft and obstructions; and expediting and maintaining an orderly flow of traffic.
Air Traffic Management (ATM)	The aggregation of the airborne and ground-based functions (air traffic services, airspace management and air traffic flow management) required to ensure the safe and efficient movement of aircraft during all phases of operations.
Air Traffic Service (ATS)	A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).
Altitude (ALT)	The distance, in feet, above mean sea level. This is the standard level reference for aircraft operations and airspace design at the lower levels to overcome variations in terrain. The aircraft altimeter is set to the barometric pressure at the aerodrome which has been adjusted to take account of the aerodrome elevation (known as QNH).
AMSL (or amsl)	Above mean sea level
AONB	Area of Outstanding Natural Beauty
ATC	Air Traffic Control
ATM	Air Traffic Management
CAA	Civil Aviation Authority
Capacity	The term used to describe how many aircraft can be accommodated within an airspace area or by a runway without compromising safety or generating excessive delay.
Centreline	The nominal track of a published route
CO_2	Carbon dioxide

Term	Explanation
Concentration	Refers to the density of aircraft flight paths over a given location. Generally, refers to high density where tracks are not spread out over a wide area. The opposite is Dispersion.
Continuous climb	A climb that is constant, i.e. without periods of level flight (sometimes referred to as "steps").
Continuous descent	A descent that is constant, without periods of level flight (sometimes referred to as "steps").
Controlled airspace	A generic term for airspace in which Air Traffic Control service is provided. There are different sub-classifications of airspace that define the particular types of air traffic services that are provided and the degree to which aircraft are required to participate.
Conventional navigation	The historic navigation standard by which aircraft fly, and routes are designed, with reference to ground-based navigation aids.
Dispersion	Refers to the density of flight paths over a given area and generally refers to low density operations where tracks or routes are "spread out" over a wide area. The opposite of Concentration.
Future Airspace Strategy (FAS)	The CAA's blueprint for modernising UK airspace in line with European and other worldwide initiatives. The CAA explains the FAS here: www.caa.co.uk/fas
General Aviation (GA)	All civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire. It covers sport and recreational flying and corporate jet and non-jet flights
Holding; holding area; Holding stacks	An airspace structure where aircraft circle one above the other at 1000ft intervals when queuing to land.

Term	Explanation
L_{eq}	Equivalent Continuous Sound Level The level of hypothetical steady sound which, over the measurement period, would contain the same frequency weighted sound energy as the actual variable sound. It is used to assess long term environmental noise exposure and takes into account the impact of many noise events over longer periods. The extent of total noise exposure is illustrated by noise exposure contours (contours of equal L_{eq}) which are, effectively, aggregations of SEL noise footprints of individual aircraft movements.
$L_{Aeq16hr}$	The A-weighted L_{eq} measured over the 16 busiest daytime hours is the normal time period used to develop the Airport Noise Contours.
L_{max}	The simplest measure of a noise event, such as an aircraft overflight, is L_{max} which is the maximum sound level recorded (in dB(A)).
Low altitude airspace	A generic term to describe airspace in the vicinity of an airport containing arrival and departure routes below 4000ft. Airports have primary accountability for the design of routes in this airspace as this and the local ATC operation is largely dictated by local environmental requirements, airport capacity and efficiency.
NATS	An air traffic service provider licensed by Government to provide the air navigation services in en-route airspace which connects the airports with each other and with the airspace of neighbouring States. NATS also provides ATS, under contract, to some airports.
Nautical Mile (NM)	Aviation measures most horizontal distances in nautical miles. One nautical mile is 1852 metres, making it approximately 15% longer than a statute mile. (Aviation uses metres for some horizontal distances such as runway lengths and visibility.) (The standard measurement of vertical distance is feet.)

Term	Explanation
Noise contours	The depiction of noise across a period of the day as a series of contours around the airport. Aircraft noise maps, which show lines joining points of equal noise, to illustrate the impact of aircraft noise around airports. Major airports publish annually or bi-annually the noise contours for the "daytime" period (0700 to 2300). These are referred to as the Leq (16 hours) noise contours.
Noise footprint	The depiction of noise from a single aircraft as a "footprint" around the airport. These are referred to as SEL footprints.
Performance-Based Navigation (PBN)	A generic term for modern standards for aircraft navigation capabilities (as opposed to conventional navigation standards). The design of future airspace routes and structures will be predicated on requiring a specified minimum navigation capability by all aircraft using the route or airspace structure. For more information, see www.caa.co.uk/pbn and www.eurocontrol.int/navigation/pbn.
Radar Vectoring	Provision of navigational guidance to aircraft by ATC in the form of specified headings based on the use of radar.
Route	Published routes that aircraft are required or plan to follow. Routes have a nominal centreline which gives an indication of where the aircraft would be expected to fly.Aircraft will fly along routes or route segments with varying degrees of accuracy based on a range of operational factors such as weather, aircraft weight, aircraft speed and altitude, and technical factors such as PBN specification and ATC intervention. (The depiction of a nominal route on a map should not be taken as an indication that aircraft will not be seen elsewhere.)
Route system or Route structure	The network of routes linking airports to each other and to the airspace of neighbouring States.

Term	Explanation
Runway designation	Airport runways are referenced by a 2-digit number which is derived from the orientation of the runway relative to magnetic north. For example, the runways at DSA are orientated on a bearing of 0017.65°M/197.66°M, the rounded-up reference numbers given to them are 02 and 20mrespectively.
Sound Exposure Level (SEL)	SEL footprints show the extent of noise energy generated from a single aircraft event, for example, an aircraft either taking off or landing.
Standard Instrument Departure procedure (SID)	A published route for departing aircraft to follow which links an airport or a runway at an airport to the en-route airspace structure. A SID incorporates both airport and en-route ATC requirements for the integration of departure routes with routes to and from other airports together with the Airport Operator's noise abatement requirements in proximity to the airport. It is presented in the UK AIP in graphical format to assist pilots in briefing themselves on the route and levels to be flown after departure. It also includes sufficient information for loading into aircraft navigation databases for use by aircraft flight management systems.
Tactical air traffic control	Air traffic control methods which involve air traffic controllers directing aircraft off the established route structures for reasons of safety or efficiency.