



# ADVISORY CIRCULAR

AC 001/2022 v1.0

# **DEFENCE NAVIGATION AUTHORISATIONS**

BP17874544

V1.0 – July 2022

An Advisory Circular is issued by the Authority to promulgate important information to the Defence Aviation community, but does not mandate any action. This includes informing the community on aviation safety / airworthiness matters, information that enhances compliance understanding for existing regulation, or policy guidance for aviation issues not yet regulated that requires further understanding.

## Audience

This Advisory Circular (AC) is relevant to:

- Military Air Operators (MAOs)
- the Capability Acquisition and Sustainment Group (CASG).

## Purpose

The purpose of this AC is to provide guidance to MAOs seeking Performance Based Navigation (PBN) and Reduced Vertical Separation Minima (RVSM) Navigation Authorisations for their aircraft Types. Navigation Authorisations are regulated under DASR SPA.05(a)6 and are authorised by Operational Specification (OPSPEC) updates from the Authority.

The scope of Navigation Authorisations that can be requested from the Authority cover all CASA-recognised PBN and RVSM operations. This AC:

- **is based** on the CASA AC 91 *series*, which covers the conduct of PBN and RVSM operations in Australian airspace
- **replaces** the PBN and RVSM content of AC 005/2016 *Defence* Compliance with Civil ADS-B and PBN Requirements of 30 Sep 2016.<sup>1</sup>

The Defence Navigation Authorisations that can be requested under this AC are the Defence equivalent to the civil Navigation Specifications defined by:

- CASA Civil Aviation Order (CAO) 20.91 (Instructions and Directions for Performance Based Navigation) Instrument 2014
- the CASA AC 91 series Performance Based Navigation
- Civil Aviation Safety Regulation (CASR) Part 91.655 *Reduced Vertical Separation Minima (RVSM) Airspace*.

<sup>&</sup>lt;sup>1</sup> AC 005/2016 has been simultaneously re-issued with this AC, to only reflect Automatic Dependent Surveillance – Broadcast (ADS-B) requirements.

## **Further information**

For further information contact:

DASA DD ORA, via email at: dasa-davnops.operationalreviews

## Status

This AC will remain current until cancelled by DASA.

Version	Date Approved	Approved By	Details
1.0	June 2022	GPCAPT DR Smith DAVNOPS	Initial release

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# **1** Reference material

### 1.1 Acronyms

Acronyms and abbreviations in this AC and its supporting forms, which are in addition to those defined in the Defence Glossary and DASR Glossary, are listed below.

A	Description
Acronym	Description
APCH	Approach
AR	Authorisation Required
BARO	Barometric
B-RNAV	Basic RNAV
CAANZ	Civil Aviation Authority of New Zealand
CPDLC	Controller-Pilot Data Link Communications
(E)TSO	(European) Technical Standard Order
EUROCAE	European Organisation for Civil Aviation Equipment
FL	Flight Level
FMS	Flight Management System
FRT	Fixed Radius Transition
IRS	Inertial Reference System
LNAV	Lateral Navigation
LNAV / VNAV	Lateral Navigation with Vertical Navigation
LP	Localiser Performance
LPV	Localiser Performance with Vertical Guidance
MSO	Military Standard Order
NSE	Navigation System Error
PBN	Performance-based Navigation
PCL	Pocket Checklist (also see QRH)
P-RNAV	Precision Area Navigation
QRH	Quick Reference Handbook (also see PCL)
RAIM	Receiver Autonomous Integrity Monitor
RF	Radius to Fix (typically associated with APCH-AR)
RNAV	Area Navigation
RNP	Required Navigation Performance
RNP APCH	RNP Approach
RNP AR APCH	RNP Authorisation Required Approach
RNP AR DEP	RNP Authorisation Required Departure
RTCA	Radio Technical Commission for Aeronautics
RVSM	Reduced Vertical Separation Minimum
TSO	Technical Standard Order
VNAV	Vertical Navigation

## 1.2 Definitions

Terms that have specific meaning within this AC and its supporting documents have been replicated from CASA ACs and are listed below.

Term	Definition
Airspace	Area(s), route(s) or procedure(s) where: navigation performance requirements have been specified (PBN specifications) and aircraft must hold an authorisation or approval for the specified requirements (PBN specifications) in order to operate in the designated environment; or aircraft navigation equipment carriage , navigation system functional or performance requirements, or aircraft installation requirements have been specified in order for an aircraft to operate in the designated environment.
Aeronautical Radio Incorporated Specification (ARINC) 424 Path Terminator	Aeronautical Radio Incorporated Specification 424 format for coding airborne navigation databases.
Letter of Acceptance (LOA)	A letter issued by a regulatory authority to a data supplier that has demonstrated compliance with the requirements of RTCA DO-200A / EUROCAE ED-76 Standards for Processing Aeronautical Data. A LOA may be a Type 1 LOA or a Type 2 LOA.
Performance-based Navigation	Area navigation based on performance requirements for aircraft operating along an Air Traffic Services (ATS) route, on an instrument approach procedure or in a designated airspace.
Receiver Autonomous Integrity Monitor	A form of Aircraft-Based Augmentation System (ABAS) whereby a GNSS receiver processor determines the integrity of the GNSS navigation signals using only GPS signals or GPS signals augmented with altitude (baro-aiding). This determination is achieved by a consistency check among redundant pseudo-range measurements. At least one additional satellite needs to be available with the correct geometry over and above that needed for the position estimation, for the receiver to perform the Receiver Autonomous Integrity Monitor (RAIM) function.
RNAV specification	A navigation specification based on area navigation that does not include the requirement for on-board performance monitoring and alerting, designated by the prefix RNAV (e.g. RNAV 5, RNAV 1).
RNP specification	A navigation specification based on area navigation that includes the requirement for on-board performance monitoring and alerting, designated by the prefix RNP (e.g. RNP 4, RNP APCH).

Type 1 LOA	Provides recognition of a navigation data supplier's compliance with RTCA DO-200A / EUROCAE ED-76 Standards for Processing Aeronautical Data, with <b>no</b> identified compatibility with an aircraft system.
Type 2 LOA	Provides recognition of a navigation data supplier's compliance with RTCA DO-200A / EUROCAE ED-76 Standards for Processing Aeronautical Data, and identifies compatibility of delivered data with <b>particular</b> avionic systems that are identified in the LOA.

## **1.3 Supporting Documents**

The following supporting documents *may* be relevant to MAOs seeking to implement the requirements of this AC.

Document	Title		
Defence References			
ADRM S3C4	Airworthiness Design Requirements Manual, Section 3 Chapter 4 – Navigation Systems		
Australian Civil Aviation Po	blicy		
Australian Government	Australian Transport Safety Regulations 2003		
Australian Government	National Aviation White Paper, 2016		
CAO 20.18	Aircraft equipment – Basic operational requirements		
CAO 20.91	Instructions and directions for PBN		
CASR Part 91.655	RVSM airspace		
CASR Part 91.660	Performance-based Navigation		
CASR Part 21	Certification and airworthiness requirements for aircraft and parts		
CASR Part 42	Continuing airworthiness requirements for aircraft and aeronautical products		
Part 91 MOS	Manual of Standards - Chapter 22 Performance Based Navigation		
National Airworthiness Authority Requirements or Standards			
US 14 CFR Part 23	Airworthiness standards: Normal, utility, acrobatic, and commuter category airplanes		
US 14 CFR Part 25	Airworthiness standards: Transport category airplanes		
US 14 CFR Part 27	Airworthiness standards: Normal category rotorcraft		

US 14 CFR Part 29	Airworthiness standards: Transport category rotorcraft
EASA CS – 23	Certification Specifications for Normal, Utility, Aerobatic, and Commuter Aeroplanes
EASA CS – 25	Certification Specifications for Large Aeroplanes
EASA CS – 27	Certification Specifications for Small Rotorcraft
EASA CS – 29	Certification Specifications for Large Rotorcraft
Advisory Material	
AC 21-36	GNSS Equipment: Airworthiness Guidelines
AC 21-38	Aircraft Electrical Load Analysis and Power Source Capacity
AC 91-05	Performance-based navigation
CASR Part 91 GM	GM 91.655 – RVSM airspace
	GM 91.660 – Performance-based navigation
CAAP 35-1	GPS: General installation guidelines
CAANZ AC 91-18	Aircraft software configuration management
EASA AMC 20-4	Airworthiness Approval and Operational Criteria For the Use of Navigation Systems in European Airspace Designated For Basic RNAV Operations
EASA AMC 20-26	Airworthiness Approval and Operational Criteria for RNP Authorisation Required (RNP AR) Operations
EASA AMC 20-27	Airworthiness Approval and Operational Criteria for RNP APPROACH (RNP APCH) Operations including APV BARO-VNAV Operations
FAA AC 20-129	Criteria for Approval of Category I and Category II Weather Minima for Approach
FAA AC 20-130A	Airworthiness Approval of Navigation or FMS Integrating Multiple Navigation Sensors
FAA AC 20-138C	Airworthiness Approval: Positioning & Nav Systems
FAA AC 25-15	Approval of Flight Management Systems in Transport Category Airplanes
FAA AC 90-45A	Approval of Area Navigation Systems for use in the U.S. National Airspace System
FAA AC 90-96A	Approval of U.S. Operators and Aircraft to Operate under Instrument Flight Rules (IFR) in European Airspace Designated for Basic Area Navigation (B- RNAV) and Precision Area Navigation (P-RNAV)
FAA AC 90-100A	U.S. Terminal and En Route Area Navigation (RNAV) Operations

FAA AC 90-101A	Approval Guidance for RNP Procedures with AR
FAA AC 90-105	Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System
FAA AC 120-29A	Criteria for Approval of Category I and Category II Weather Minima for Approach

<b>Technical Standard Orders</b>	
ETSO C106	Air Data Computer
ETSO C115b	Airborne Area Navigation Equipment using Multi- Sensor Inputs
ETSO C129a	Airborne Supplemental Navigation equipment using GPS
ETSO C145	Airborne Navigation Sensors Using GPS Augmented by the Wide Area Augmentation System (WAAS)
ETSO C146	Stand-Alone Airborne Navigation Equipment Using the GPS Augmented by the Wide Area Augmentation System (WAAS)
US MSO C129b	Airborne Supplemental Navigation Equipment Using the Global Positioning System (GPS) / Precise Positioning Service (PPS)
US MSO C145b	Airborne Navigation Sensors Using the Global Positioning System (GPS) /Precise Positioning Service (PPS) for Area Navigation (RNAV) in Required Navigation Performance (RNP) Airspace and for Automatic Dependent Surveillance- Broadcast (ADS-B)
US TSO C106	Air Data Computer
US TSO C115c	FMS using multi-sensor inputs
US TSO C129a	Airborne Supplemental Nav Equipment Using GPS
US TSO C145e	Airborne Navigation Sensors using GPS Augmented by the Satellite Based Augmentation System (SBAS)
US TSO C146c	Stand-Alone Airborne Navigation Equipment Using The Global Positioning System Augmented By The Satellite Based Augmentation System
US TSO C196a	Airborne Supplemental Navigation Sensors for Global Positioning System Equipment using Aircraft-Based Augmentation

Annex 6 to the Chicago Convention	Operation of Aircraft		
Document 9613 Ed4	Performance Based Navigation (PBN) Manual		
Document 9905 Ed2	Required Navigation Performance Authorization Required (RNP AR) Procedure Design Manual		
Document 9997 Ed2	Performance Based Navigation (PBN) Operational Approval Manual		
European Organisation for	Civil Aviation Equipment (EUROCAE) documents		
ED-26	Minimum performance specifications for airborne altitude measurements and coding systems		
ED-72A	Minimum Operational Performance Specifications for Airborne GPS Receiving Equipment used for Supplemental Means of Navigation		
ED-75B	MASPS: Required Navigation Performance for Area Navigation (RNAV)		
ED-76	Standards for Processing Aeronautical Data		
ED-77	Standards for Aeronautical Information		
RTCA Inc. Documents			
DO-88	Altimetry		
DO-200A	Standards for Processing Aeronautical Data		
DO-201A	Standards for Aeronautical Information		
DO-208	Minimum Operational Performance Standards for Airborne Supplemental Navigation Equipment using Global Positioning System (GPS)		
DO-229D	Minimum Operational Performance Standards for Global Positioning System/Wide Area Augmentation System Airborne Equipment		
DO-236B	Minimum Aviation System Performance Standards: Required Navigation Performance for Area Navigation		
DO-283A	Minimum OPS Performance Standards for Required Navigation Performance for Area Navigation		
DO-316	Minimum Operational Performance Standards for Global Positioning System/Aircraft Base Augmentation System Airborne Equipment		
Aeronautical Radio, Inc. (ARINC) Documents			
ARINC 424	Navigation Systems Data Base		
ARINC 706	Mark 5 Air Data System		

Society	of Automotive	Engineering:	Aeronautical	Recommended Practices

ARP-920A Design and Installation of Pitot-Static Systems for Transport Aircraft

ARP-942

Pressure Altimeter Systems

Unless specified otherwise, all regulation references in this AC refer to the Defence Aviation Safety Regulation (DASR).

# 2 Introduction

#### 2.1 Background

- 2.1.1 Performance Based Navigation (PBN) and Reduced Vertical Separation Minima (RVSM) requirements form part of an internationally-recognised framework for the implementation of improved aircraft area navigation capabilities. Their emphasis is on the use of Global Navigation Satellite System (GNSS) technology and computerised on-board systems, as opposed to traditional fixed (ie terrestrial) ground-based navigation aids to enable area navigation. PBN and RVSM operations have the potential to provide increased safety, efficiency and environmental benefits through the optimisation of airspace, thus also improving aviation safety. All International Civil Aviation Organisation (ICAO) member nations are introducing PBN and RVSM requirements.
- 2.1.2 PBN encompasses two broad navigation specification sets:
  - RNP (Required Navigation Performance)
  - RNAV (aRea NAVigation).

The difference between RNP and RNAV is that On-Board Performance Monitoring and Alerting (OBPMA) is required for RNP<sup>2</sup>, but not for RNAV.

- 2.1.3 CAO 20.18 mandated the installation of GNSS into all civil instrument flight rules (IFR) aircraft from 4 Feb 16. On that date, the Back-up Navigation Network (BNN) was activated, resulting in approximately 200 terrestrial navigation aids being withdrawn from service in Australia (about 50%). Therefore, from that date, Australia effectively became GNSS-based PBN and RVSM airspace.
- 2.1.4 Under the Civil Aviation Act 1988, State aircraft (of which Defence Registered Aircraft are a subset) are not bound by civil aviation rules. However, Defence aerospace platforms need to regularly use both domestic and international civil and military airspace for their Defence roles. Additionally, the Australian Government's *National Aviation Policy White Paper* notes that 'Defence, in collaboration with Air Services, is committed to improving civil and military aviation harmonisation, and to enhance better airspace access arrangements'.<sup>3</sup> Hence, the tailored application of PBN and RVSM requirements in Defence aircraft will ensure that Defence aviation assets can continue to maximise their operational effectiveness.

<sup>&</sup>lt;sup>2</sup> Excluding RNP10.

<sup>&</sup>lt;sup>3</sup> Page 128.

## 2.2 AC purpose

2.2.1 A Navigation Authorisation **must** be obtained from the Defence Aviation Safety Authority (DASA) **for each navigation specification intended to be used** by a MAO (ie for both PBN and RVSM). Authorisations will be granted under DASR SPA.05(a)6. Following substantiation of initial airworthiness, continued airworthiness, and flight operations requirements, the Authority will individually add those specifications requested to the applicable OPSPEC as a 'specific approval' in the relevant aircraft Type annex.

## **3** Defence Navigation Authorisation process

#### 3.1 AC structure

- 3.1.1 This AC provides tailored guidance to allow authorisation of specific Defence navigation operations in PBN and RVSM airspace. CASA civil framework requirements<sup>4</sup> have been used as the basis for this AC, and for the creation of <u>DASR Form 1307</u> *Application for Navigation Specification Authorisation*. The DASR Form is used to manage Defence Navigation Authorisation requests from MAOs and assists to document compliance against requested PBN and RVSM specification requirements. The content of <u>DASR Form 1307</u> will be updated as changes to applicable civil documents are promulgated.
- 3.1.2 Annex A to this AC provides MAOs with <u>DASR Form 1307</u> completion guidance. The annex also assists applicants to compile Navigation Authorisation data packs for each specification requested, to support claims for the demonstration of requirement compliance.
- 3.1.3 Note that the term 'Navigation Authorisation' is common to Defence and CASA, whereas ICAO refers to these *same* authorisations as 'Operational Approvals'. Nonetheless, the two terms are synonymous.

## 3.2 DASA Form 1307 – Application for Navigation Specification Authorisation

3.2.1 MAOs request additional Defence Navigational Authorisations from the Authority using <u>DASR Form 1307</u>. Several CASA-recognised navigation specifications can be authorised, as listed below. All are included in <u>DASR</u>

<sup>&</sup>lt;sup>4</sup> CAO 20.18, CAO 20.91 and CASR Part 91.655 define the basis of Australian civil PBN and RVSM requirements. CASA AC 21-36 defines airworthiness and aircraft installation requirements related to the retrospective fitment of GNSS to existing aircraft for PBN and RVSM purposes.

<u>Form 1307</u>. Specifications can be considered either 'non-core', 'core', or 'supplemental'.

- 3.2.2 Non-Core specifications normally require a more complex approval process, while Core specifications do not. Non-Core specifications also include those specifications that are detailed in other regulatory documents but administered in accordance with the nominal PBN approval process (ie such as RVSM).
- 3.2.3 Supplemental specifications either support a specific authorisation, provide an alternate means to support an authorisation, or provide supplemental navigational capabilities.
- 3.2.4 All specifications can be applied for individually on the same DASR form. However, some specifications cannot be used in isolation to others, and some of the more precise specifications can automatically include requirements of the less precise specifications—known as 'nesting'. <u>DASR</u> <u>Form 1307</u> describes where these cases exist.
  - a. **Non-Core** specifications:
    - (1) RVSM
    - (2) RNAV (RNP) 10
    - (3) RNP 4
    - (4) RNP AR, including:
      - a. RNP AR APCH
      - b. RNP AR DEP
    - (5) RNP 0.3
    - (6) Advanced RNP
    - (7) NAT HLA MNPS
  - b. **Core** specifications:
    - (1) RNAV 5
    - (2) RNAV 1 and/or 2
    - (3) RNP 1, 2
    - (4) RNP APCH variations, as follows:
      - (a) LNAV

- (b) LNAV/VNAV
- (c) LP
- (d) LPV
- c. Supplemental specifications:
  - (1) APV / Baro-VNAV
  - (2) Radius to Fix Path Terminator
  - (3) Fixed Radius Transition
  - (4) Time of Arrival Control
  - (5) Use of suitable area navigation systems on conventional routes and procedures (both enroute and terminal).

#### 3.3 Identifying MAO navigation specifications required

3.3.1 MAOs should use guidance in Table 1 to identify the likely navigation specifications required for their operations before submitting an application to the Authority in accordance with this AC. Once specifications are identified, MAOs must use <u>DASR Form 1307</u> to support the collection of evidence associated with their application.

LSN	Typical Operation	Applicable Navigation Specification(s)		
1	Australian continental operations not entering oceanic airspace that include en route, terminal and RNAV (GNSS) approach.	<ul> <li>RNP 2</li> <li>RNP 1</li> <li>RNP APCH – LNAV</li> </ul>		
2	Australian continental operations not entering oceanic airspace that include en route, terminal and RNAV (GNSS) approach with Baro-VNAV.	<ul> <li>RNP 2</li> <li>RNP 1</li> <li>RNP APCH – LNAV</li> <li>Baro-VNAV</li> </ul>		
3	Operations entering oceanic airspace as well as continental operations that include en route, terminal and RNAV (GNSS) approach.	<ul> <li>RNP 10 (RNAV 10)</li> <li>RNP 2</li> <li>RNP 1</li> <li>RNP APCH – LNAV</li> </ul>		
4	Operations entering oceanic airspace as well as continental operations that include en route, terminal and RNAV (GNSS) approach that will also be operating in airspace with the service volume of a Space Based Augmentations System (SBAS) system.	<ul> <li>RNP 10 (RNAV 10)</li> <li>RNP 2</li> <li>RNP 1</li> <li>RNP APCH – LNAV</li> <li>RNP APCH – LP and LPV</li> </ul>		
5	Operations entering oceanic airspace with reduced separation (30 NM lateral and longitudinal separation) as well as continental operations that include en route, terminal and RNAV (GNSS) approach.	<ul> <li>RNP 10 (RNAV 10)</li> <li>RNP 4</li> <li>RNP 2</li> <li>RNP 1</li> </ul>		

LSN	Typical Operation		Applicable Navigation Specification(s)
	<b>Note</b> : There are likely to be additional requirements for aircraft to be equipped with Controller-Pilot Data Link Communications (CPDLC) and Automatic Dependent Surveillance – C (ADS-C) to support reduced separation operations in oceanic airspace.	•	RNP APCH – LNAV
6	Aircraft that operate in B-RNAV airspace in Europe.	•	RNAV 5
7	Aircraft that operate in European P-RNAV airspace or US RNAV Type A or Type B airspace.	•	RNAV 1 RNAV 2

## 3.4 CASA 'Deeming' provisions do not apply

3.4.1 CASA AC 91-05 allows aircraft already fitted with appropriate GNSS equipment to be automatically 'deemed' to meet the requirements of some navigation specifications. However, as all Defence navigation specifications are individually authorised by the Authority before being entered onto OPSPECs, civil 'deeming' provisions will not be used by Defence. Nevertheless, the Defence approval process for these specifications is simplified.

# 3.5 MAO PBN and RVSM education and training development guidance

3.5.1 MAO self-training development guidance and sample artefacts are accessible from <u>gBP38113</u>. Their aim is to support MAO development of training materials that can allow the qualification of aircrew for the expected PBN and RVSM operations.

# Annex A: APPLYING FOR A NAVIGATION AUTHORISATION

#### A.1 Applying for a Navigation Authorisation - General

- A.1.1 To gain a DASA Navigation Authorisation the applicant:
- A.1.1.1 uses <u>DASR Form 1307</u>
- A.1.1.2 supports <u>DASR Form 1307</u> with the required evidence against the specification(s) selected.
- A.1.2 Applications should be submitted to DASA *prior to* navigation specification operation, and with sufficient time to enable DASA assessment. For initial PBN and RVSM applications, 90 days prior to expected operations is a nominal target. This time allows for the resolution of potential shortfalls identified against the requested specification(s).
- A.1.3 Early applicant discussions with the DAVNOPS and DIA Desk Officers (DeskOs) are recommended. This ensures that DeskOs are aware that an application is in work, and to broadly confirm that a Navigation Authorisation is likely to be provided *before* committing significant applicant resources (A.1.5 refers).
- A.1.4 To provide an approval, the Authority is required to assess each specification's evidence against three navigation component requirements. The three components are the same for each specification, but the level of detail differs dependent on the specification chosen. Evidence must demonstrate compliance as follows:
  - a. **Component 1**: Initial Airworthiness and aircraft eligibility requirements.
  - b. **Component 2**: Continued Airworthiness requirements.
  - c. **Component 3**: Flight operations procedures and training requirements.
- A.1.5 When compliance is demonstrated, the Navigation Authorisation(s) requested will be added by the Authority to the applicable OPSPEC. However, where aircraft **have not** previously been certified for PBN or RVSM, a complementary *Major change* to Type Design **will also be required**, to update the aircraft's Type Certification Basis. The change to Type Design **must be actioned before** a request for Navigation Authorisation can be granted by the Authority.

#### A.2 Pre form submission

- A.2.1 Applicants must use <u>DASR Form 1307</u> to self-review the evidence requirements of each navigation specification sought. The review assists to refine the simplicity of the Navigation Authorisation approval process. In order of increasing complexity, the application processing options are:
  - a. Application is based upon an **existing** Navigation Authorisation (eg RNP 2 authorisations can be based on Navigation Authorisations already held for either RNP 1, RNP APCH or RNP AR).
  - b. Application is based upon a **prior certification** against relevant specification requirements.
  - c. Application is based upon **demonstration** that on-board equipment (and its installation) **meets** the navigation specification's functional, display, and alerting requirements.
  - d. Application is based upon **demonstration** that on-board equipment (and its installation), when supported by defined workarounds (with or without operational procedures), **provides functional equivalence** to the specification's functional, display, and alerting requirements.
  - e. Application is based upon **an agreed alternate approach** to achieving a solution that **achieves functional equivalence** to the specification's functional, display, and alerting requirements.
- A.2.2 **Applicability of Supplementary Approvals.** Supplementary approvals (eg RF or FRT), may be applied for, and used, in conjunction with several navigation specifications. <u>DASR Form 1307</u> defines the applicability of these supplementary approvals and lists the additional evidence necessary.
- A.2.3 **Navigation Authorisation evidence requirements**. The following apply against the three Navigation Authorisation evidence component requirements:
- A.2.3.1 Component 1 Initial Airworthiness and aircraft eligibility. <u>DASR Form</u>
   <u>1307</u> guides applicants through self-evaluation, and the evidence necessary, by using specification requirement question sets.<sup>5</sup>

Note: For those aircraft that have not previously been certified for PBN or RVSM (ie there is no declaration of PBN or RVSM eligibility in the AFM, or no other technical data disclosing PBN or RVSM certification status), this component includes the need for the applicant to engage with the relevant Military Type Certificate Holder (MTCH). Engagement with the MTCH is necessary to progress a complementary *Major change* to Type Design, for the inclusion of applicable PBN and RVSM airworthiness design requirements and standards into the requested aircraft's Type Certification Basis. The change to Type design **must be actioned before** a request for Navigation Authorisation can be granted by the Authority.

A.2.3.2 **Component 2 - Continued Airworthiness**. <u>DASR Form 1307</u> guides applicants through the evidence necessary to demonstrate that navigation system components will remain compliant with the approved Type Design while in-Service, and that the navigation database used is valid. This includes confirmation that approved maintenance schedules remain suitable for the choice of specification(s) selected, or that any additional maintenance required to sustain viable PBN and RVSM operations has been documented within the applicable aircraft maintenance program.

#### A.2.3.3 Component 3 - Flight operations procedures and training.

- a. Flight operations procedures. <u>DASR Form 1307</u> lists required operational requirements for each navigation specification. These include policies, procedures and practices that are expected to be documented in approved operations manuals, instructions, supplementary publications, or OIP equivalents. The scope of evidence required includes:
  - operating policies to support the specified PBN and RVSM operations under all normal and emergency conditions
  - (2) flight crew procedures and checklists for all specification use, in context
  - (3) PBN and RVSM-related Minimum Equipment Lists (MELs), or their equivalent
  - related planning, management and approval systems (including Navigation Database updates and validation mechanisms, and mission planning procedures)
  - (5) the reporting and management of Navigation Database discrepancies and errant aircraft behaviour during PBN and RVSM operations.
- b. Flight operations training. <u>DASR Form 1307</u> lists both generic and specific flight operations training requirements applicable to each navigation specification. The scope of training evidence required includes:
  - flight crew training programs, competency assessments, currency requirements, and training records
  - (2) maintenance staff training requirements.

- A.2.4 **Navigation specification requirements 'Shortfall Resolution Loop'**. Where <u>DASR Form 1307</u> requirements cannot be met outright by the applicant, the Form supports a 'shortfall resolution loop' in consultation with DASA DeskOs. The applicant must demonstrate that the alternate means of compliance achieves functional equivalence to the published PBN or RVSM standard. The resolution loop is iterative and may need to be exercised for multiple requirements during the application process. Shortfall resolution involves the:
  - a. DASA DeskO and applicant reviewing shortfalls identified in <u>DASR Form</u> <u>1307</u>, and discussing potential pathways to demonstrating compliance
  - b. applicant proposing an appropriate alternative to specification compliance, that can still demonstrate functional equivalence—for example:
    - (1) prior certifications
    - (2) operational or crew-based workaround procedures that can be demonstrated to achieve functional equivalence instead.<sup>6</sup>
- A.2.4.1 **Demonstrating functional equivalence**. The process to demonstrate functional equivalence is contextual and dependent on *quantifying* the shortfall in each requirement. Demonstrating equivalence may therefore require the applicant to collect significant additional data, and the coordination or conduct of activities such as:
  - a. formal flight test programs
  - b. formal operational human factors and workload assessments
  - c. development of learning management plans to confirm 'sustained' workaround efficacy
  - d. development, review or conduct of aircraft Type Design System Safety Assessments and associated working groups
  - e. updated formal Risk Management Plans and Mission Risk Profiles.
- A.2.4.2 Where the Authority does not consider that a successful functional equivalence argument has been made, the Authority and the applicant will discuss whether further options can apply. The applicant may then choose to continue, or to cease that particular Navigation Authorisation request.

<sup>&</sup>lt;sup>6</sup> The procedures, their training requirements, and associated competency assessments, must also be provided as evidence.

#### A.3 Applying to the Authority

- A.3.1 Substantiating evidence data pack. <u>DASR Form 1307</u> automatically tabulates applicant responses to each requirement. To finalise the submission, the applicant must deliver to the Authority the Form and an evidence data pack that demonstrates compliance with the relevant requirements in the form. All information is submitted under cover of a Minute from the MAO, addressed to DAVNOPS at <u>email: dasa-davnops.operationalreviews</u>, listing the navigation specifications requested to be added for each aircraft Type.
- A.3.2 When submitting the data pack, applicants should provide a summary of documents attached, and a description of each document's content. This will simplify assessments.
- A.3.3 **Submission Checklist.** Table A.1 below provides applicants with an *aide memoire* checklist for the generic evidence that applicants *are likely to need to* include for most evidence data packs. However, not all items will be required for all applications, nor is the list exhaustive.

#### Table A.1 – Application Submission Aide Memoire Checklist

#### Submission Checklist Item

#### DASR Form 1307

• In original MS Excel Format

#### Initial Airworthiness and Aircraft Eligibility

- Aircraft airworthiness documents which satisfy the Authority that the aircraft is Type certified for the requested PBN and RVSM operations (eg AFM, AFM Supplements, OEM service letters, Type Certificate Compliance Document).
- A detailed description of the relevant aircraft equipment for the proposed operations, including a configuration list of components and equipment, and how the system meets the applicable requirements for the requested PBN and RVSM operations.

#### **Continued Airworthiness**

- A detailed description of the maintenance program used to ensure the continued airworthiness of the aircraft and of the PBN and RVSM equipment for the requested operations. This requirement need only address those circumstances where additional PBN or RVSM-specific maintenance is required.
- The applicable Aircraft Maintenance Manual reference for the relevant PBN and RVSMrelated system/s.
- The applicable extracts from the Minimum Equipment List (Airworthiness items) and/or applicable instructions that demonstrate identification and management of:
  - o any unserviceability that affects the conduct of any PBN and RVSM operation
  - the systems that GNSS interfaces with, so that in the event of the GNSS being inoperative, the full impact of the failure can be readily determined

#### Submission Checklist Item

- The rationale for selection of these specific MEL items as having an impact on safe PBN and RVSM operations should be addressed, and any associated risk assessments attached.
- Precise references to all documents that assist in demonstrating compliance.
- Complete aircraft equipment list for the operations requested (make, model, part number (both hardware and software)).

#### Airworthiness - Digital Data

- A detailed description of the method used to receive updates to, the frequency of updates, and to ensure the validity of the airborne navigation database. This should address the validation of data provided by an external agency and/or internally, and its verification procedures, should any internal changes to the supplied data be made (note: this should encompass all digital navigation data coverage (including map and chart data used in flight during the conduct of PBN or RVSM procedures, or for ground verification), acquisition, manipulation, and management to encompass all areas of Defence aircraft operations).
- Evidence that the suppliers of the Navigation Database comply with the minimum integrity requirements of the most stringent PBN or RVSM authorisation requested.

#### Flight Operations Processes

- PBN and RVSM operational procedure, including normal and emergency, published in OIP. These procedures should include flight planning, pre-flight, inflight and post-flight.
- Procedures should include and be documented by relevant copies of, or extracts from, the following:
  - o the operations manual
  - the checklists
  - the contingency procedures
  - the QRH (or equivalent)
  - copies of the sections of the MEL applicable to the requested PBN and RVSM operations
  - o copies of relevant Flying Orders or other published instructions
  - o any aircraft and operational limitations
  - management of Electronic Flight Bags
  - monitoring, management, review and reporting (including navigation errors/system failures and database error reporting)

#### Training and Qualifications

- A detailed description of the proposed aircrew, maintenance and other applicable personnel and specialists' training for the requested PBN and RVSM operations, associated competencies and currency requirements, including a copy of the Learning Management Plan and associated artefacts.<sup>7</sup>
- Copies of relevant training syllabi, training proficiency examination and assessment templates and currency assessment templates.

<sup>&</sup>lt;sup>7</sup> Foundational knowledge is listed in CASR Part 61 MOS (Vol 3, App 2, Sect 2.1 paras 5.2-7).