FACTSHEET – AERODROME DESIGN REQUIREMENTS AND CERTIFICATION BASIS

INTRODUCTION

Aviation safety regulations for Defence aerodromes are contained in DASR.139 – *Aerodromes*. Within these regulations, DASR.139.80.A requires an Applicant for an aerodrome certification to: Define an Authority-agreed Certification Basis (CB) for the aerodrome; Demonstrate that the aerodrome design and construction complies with the agreed CB; Declare that the aerodrome design and construction complies with the agreed CB; Implement arrangements to support continued aerodrome compliance with the CB; and Provide design information to support continuing safe operation of the aerodrome.

Central to this is an aerodrome CB. An aerodrome CB is an agreed set of aviation safety requirements that the aerodrome must be compliant with in order to obtain an Aerodrome Certificate. The creation of an agreed CB is therefore pivotal to aerodrome certification. This factsheet describes what a CB is, how a CB may be developed and tailored, and when a CB is to be approved by the Authority. In doing so, the factsheet provides an overview of the aerodrome design requirements and describes how they are used to develop a CB. The factsheet also describes how future changes to the Authority-approved CB can be made.

AERODROME DESIGN REQUIREMENTS

The aviation safety requirements for Defence aerodromes which form the basis of the CB are prescribed within Section 6 of the DASA's *Airworthiness Design Requirements Manual (ADRM)*. The ADRM aerodrome design requirements leverage heavily, where possible, on a primary design standard that has been identified as domestic or international 'good practice' for aerodrome design. The design requirements for aerodromes within Section 6 are contained in three chapters:

- Chapter 2 focuses on land-based aerodromes that are intended mainly for use by fixed wing aircraft. It employs a primary design standard of Civil Aviation Safety Authority (CASA) Part 139 (Aerodromes) Manual of Standards 2019 (Part MOS 139) (September 2019), including the MOS Part 139H - Standards Applicable to the Provision of Aerodrome Rescue and Fire Fighting Services (MOS Part 139H) (January 2005).
- Chapter 3 focuses on land-based heliports. It employs a primary design standards of International Civil Aviation Organisation (ICAO) Annex 14 Aerodromes Volume 2 Heliports (Fifth edition, July 2020) and Unified Facilities Criteria UFC 3-260-01 Unified Facilities Criteria (UFC) Airfield and Heliport Planning and Design (Feb 2019) for military context.
- Chapter 4 focuses on shipborne heliports. No single primary design standard is employed for shipborne heliports; rather, a bespoke standard has been derived by DASA through identifying what constitutes 'good practice' by major international military and civilian authorities.

The ADRM adapts the primary design standard through supplementation or tailoring to account for Defence's unique operational context. This may be needed where the primary design standard:

- is silent on specific design elements needed for Defence aerodromes, such as military-specific capability requirements;
- does include requirements for a particular design element, but Defence experience has shown it needs to be varied for the Defence operational context; and/or
- is not entirely compatible with mandatory Australian legislative design requirements, for example electrical wiring.

The ADRM is periodically updated, either to reflect international progress in 'good practice' design for aerodromes, or to capture Defence's experiences in identifying and managing aerodrome hazards. These updated requirements are not automatically levied on Defence aerodromes with an extant Aerodrome Certificate[1].

Section 6 aims to cater for most Defence capability needs, although supplementation or tailoring may occasionally be needed for niche capabilities.

[1] They will, however, be an essential input to the Aerodrome Operator's Safety Management System (SMS)

DEVELOPMENT OF A PROVISIONAL CERTIFICATION BASIS

The development of a CB for a particular aerodrome starts with the design requirements in the relevant ADRM Section 6 chapter[2].

The ADRM chapters necessarily cater for a broad range of Defence aerodrome capabilities. However, not every aerodrome will require every one of those capabilities, so some ADRM requirements may be superfluous. Thus the first step is to "tailor out" design requirements which are not required for the intended aerodrome capability[3]. As an example, Night Vision Device (NVD) compatibility may not be a capability requirement for some aerodromes, so the related design requirements can be removed. Any such tailoring needs to be identified and documented. Tailoring can be recorded within the CB Template via a short description and reference to the document justifying the omission.

Similarly, the ADRM cannot pragmatically capture every possible niche use for an aerodrome. Where relevant design requirements are not contained in Section 6 of the ADRM, the Applicant will need to identify or develop special detailed technical requirements (i.e. bespoke requirements), which will need to be added to the CB.

The resulting CB is known as a 'provisional CB', simply because additional tailoring may still be identified as the design and production process develops. An overview of the process for developing a provisional CB is provided in Figure 1.

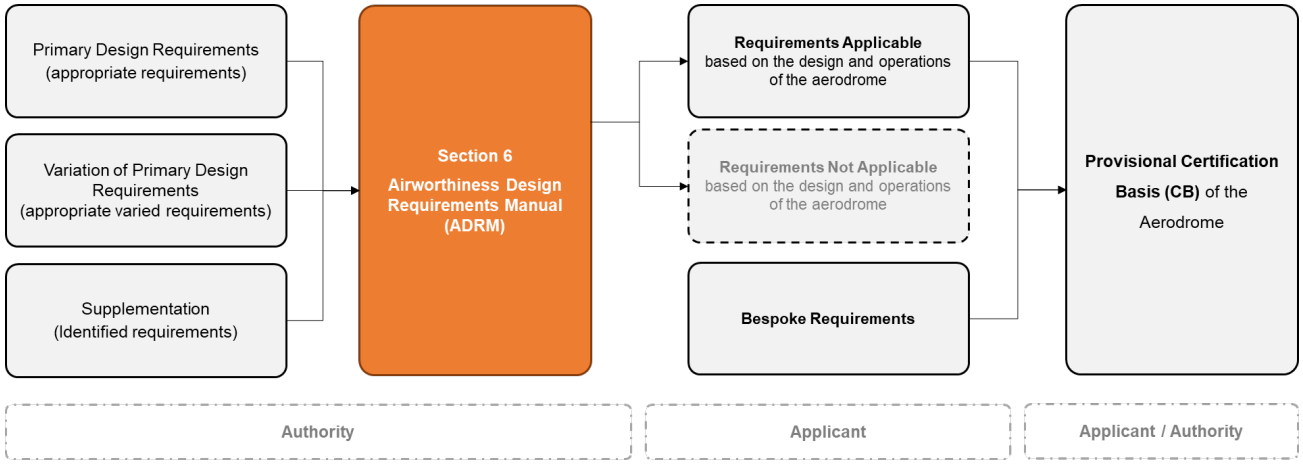

Figure 1: Development of provisional CB from requirements contained in Section 6 of the ADRM

Once all the relevant design requirements are identified, the Applicant can submit the proposed CB to the Authority for approval. The provisional CB represents the 'target' aerodrome design and construction requirements.

Once a provisional CB is approved, the Applicant designs the aerodrome (for new aerodromes or new changes to an aerodrome) or will commence the demonstration of compliance activities (for existing aerodromes) to comply with the CB.

MANAGEMENT OF NON-COMPLIANCES TO THE CERTIFICATION BASIS

There may be occasions where the design or construction of a Defence aerodrome does not meet the provisional CB. If it is not reasonably practicable to change the design or construction to remedy the non-compliance, and where Defence has a well-defined capability imperative that justifies the non-compliance Military Aerodrome Certification Review Items (MACRIs) may be used to tailor the CB.

An Equivalent Safety Finding (ESF) MACRI may be used if the Applicant is able to demonstrate via a safety argument that the tailored design requirement still presents an equivalent level of safety (ELOS). This is often the

[2] To support the community, DASA has developed CB Templates for each of the Chapters (2, 3 and 4) within Section 6 of the ADRM to contain all requirements from these chapters, which may be used by a Project.

[3] New aerodromes will often have a documented 'operating intent' that has been agreed between the prospective Aerodrome Operator and major aerodrome users. Such a document is particularly useful for identifying what is in and out of scope for the aerodrome.

case where an enduring limitation is placed on the aerodrome that eliminates the otherwise elevated risk presented by the non-compliance.

If an Applicant cannot make an ELOS argument an Exception MACRI may be used. The non-compliance means there will be an elevated risk above that presented by a compliant design, and this risk will require Command management and retention. The Applicant must use Defence's 7 step Safety Risk Management (SRM) process to demonstrate that risks to safe flight operations at the aerodrome arising from the non-compliance have been eliminated or otherwise minimised so far as reasonably practicable (SFARP). The DASA has developed an Aerodrome Issue Paper (AdrIP) form to support application of the Defence 7-Step SRM process. To document the risk management an Aerodrome Operator may use an AdrIP, or other equivalent/suitable documentation.

DASA has MACRI application forms for both ESF MACRIs and Exception MACRIs. All MACRIs must be recorded against the applicable requirement within the CB, as the MACRI is the Authorities approval of the changed requirement (changed by direct wording change and / or through the conditions limitations and other treatments that must be implemented). For details on dealing with CB non-compliances refer to *Factsheet – Military Aerodrome Certification Review Items* and *Factsheet – Aerodrome Issue Paper*.

AUTHORITY APPROVAL OF THE FINAL CERTIFICATION BASIS

Once all eligible MACRIs have been approved and compliance demonstrated to all requirements the Applicant can then declare compliance to the CB and apply for an Aerodrome Certificate. When DASA issues the Aerodrome Certificate, the CB is captured as the enduring design requirements for the aerodrome[4].

It should be noted that implementing arrangements to support continued aerodrome compliance with the CB, and providing design information to support continuing safe operation of the aerodrome are also integral parts of the aerodrome certification process and are needed for approval of the Aerodrome Certificate. For details on the certification process, and these elements, refer to *Factsheet – DASR.139 Aerodrome Certification Process*.

CONFIGURATION MANAGEMENT AND FUTURE CB CHANGES

During the service life of an aerodrome, configuration changes will inevitably be required. These changes must either meet the CB, or where this is not reasonably practicable, the CB must be changed. This presents three scenarios:

- Changes that do not impact the CB and have no appreciable safety effect on flight operations must still be shown to meet the CB, however they are not required to be presented to the Authority for approval. They must be made available at Authority request and are likely reviewed during normal Authority oversight activities.
- Changes that do not impact the CB but have an appreciable safety effect on flight operations will require the conduct of a certification program, and formal approval by the Authority that the new design continues to meet the CB.
- Changes that cannot comply with the extant CB will require the approval of an updated CB as well as completion of a certification program against the updated CB. Once the program is complete, the Aerodrome Certificate will be re-issued, which will include capturing the updated CB.

For details on future changes to Aerodrome certification refer to *Factsheet – Changes to Aerodrome Certification*.

TOOLS AND TEMPLATES

The DASA has developed CB Templates for land based aerodromes intended primarily for use by fixed wing aircraft, land based heliports and shipborne heliports. These templates contain all of the design requirements from the relevant chapter of the ADRM (this include the design requirements from the primary standard, and supplementation for military context). An Applicant / Project / Aerodrome Operator may find these Templates useful during CB development, approval and for management throughout the service life of an aerodrome.

The templates may assist in the development of a provisional CB by supporting the applicant in identifying the applicability of requirements, tailoring out those not required, adding bespoke requirements, capturing necessary

[4] In practice, Aerodrome Operators may elect to employ a more detailed version of the CB, often called a Certification Checklist (CCL), which also includes information / data captured to support management of the aerodrome configuration (for example the information may include reference to evidence of compliance and compliant position and capture details of all MACRIs). Provided the CCL always remains entirely aligned to the Authority-approved CB, such a tool is acceptable to the Authority.

justifications and identifying reference source documents. In addition to this, the template also supports capture of / reference to; compliance demonstration evidence, MACRI information, arrangements to support continued aerodrome compliance with the CB, and design information to support continuing safe operation of the aerodrome. This information can be used to form part of the application for an aerodrome certificate.

The DASA has developed a user guide that provides step by step instructions on how to use the CB Templates. The CB Templates and user guides are available on the DASA website, or can be provided to the Applicant on request. While the use of the template is not mandatory, it provides a transparent and systematic tool, and will support consistency across the Defence community.

USEFUL INFORMATION

- DASR.139 Regulations:
  https://www.defence.gov.au/DASP/Docs/Manuals/8000-011/DASRWeb/index.htm#15303.htm
- ADRM, Section 6:
  https://www.defence.gov.au/DASP/Docs/Manuals/7001054/ADRMWeb/index.htm#25288.htm
- DASA Aerodrome Group Mailbox:
  dasa.aerodromes@defence.gov.au