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DEFENCE AVIATION SAFETY REGULATION


Introduction to DASR 145



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Online Course Administration

- Welcome / course intro
- Introductions / comms check
 - Name, organisation, role, experience, aim
- Emergency brief
- Style – guided discussion
- Questions
- GovTeams etiquette
- Terminology (acronym bingo)
- Feedback methods
- Attendance

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Introduction to DASR 145 Course Program

Time	Activity
0830 To 0930	<ul style="list-style-type: none"> •Introduction •DASA Revision <ul style="list-style-type: none"> ○DASP Structure ○Origins of DASR ○Where does DASR 145 fit
0945 To 1100	<p>DASR 145- The Regulations</p> <ul style="list-style-type: none"> ○Facilities ○Personnel and Authorisations ○Equipment tools Material and Data ○Acceptance of Components ○Performance of Maintenance ○Certification of Maintenance ○Maintenance Records ○Occurrence Reporting ○Quality and ASMS
1115 To 1230	<p>DASR 145- The Regulations</p> <ul style="list-style-type: none"> ○Exposition ○Privileges ○Limitations ○Changes to the organisation ○Continued Validity ○Findings ○DASR 145 Review - Comments/Feedback

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Course Aim and Learning Outcomes

To provide students with detailed knowledge of maintenance concepts, and an overview of the DASR 145 regulations and their implementation.

Learning Outcomes:

- Describe the purpose of DASR 145 Approved Maintenance Organisations (AMO).
- Describe the management requirements of the Maintenance Organisation Approval.
- Describe the requirements to form an AMO.
- Explain the regulated functions of the AMO.
- Displays a positive attitude towards learning and engages actively during the course.

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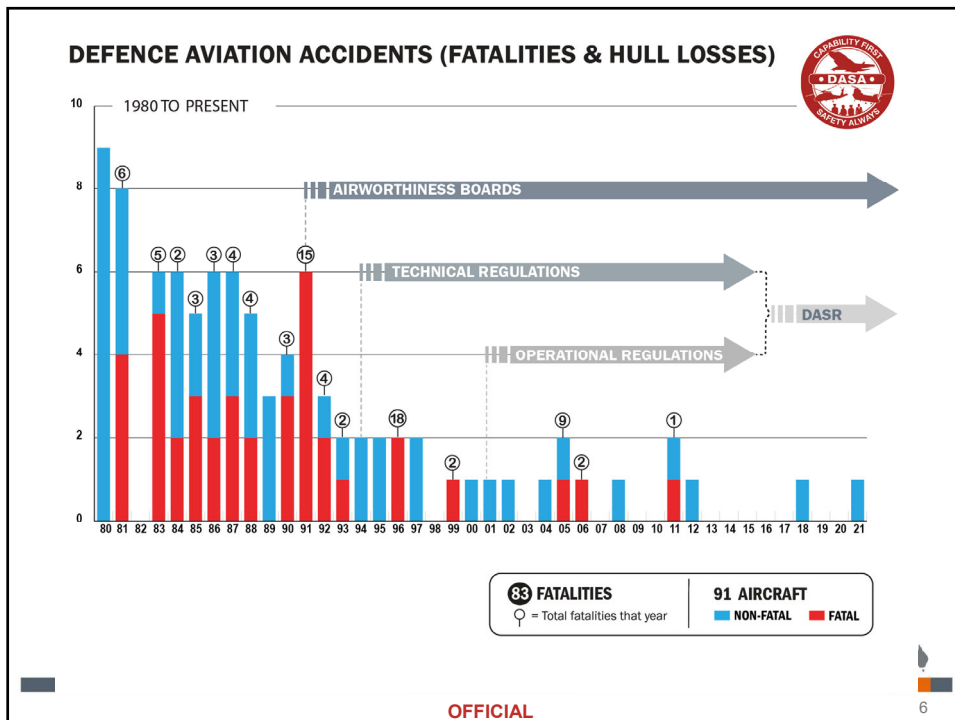
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How did we get here?

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DASA Purpose – WHS and CDF/SEC JD 21/2021

Command exploits air power in satisfaction of Australia's Strategic Defence Initiatives (SDIs) while satisfying statutory safety obligations. Command must ensure that hazards are eliminated SFARP or if not, that risks are minimized SFARP.

DASF amplifies statutory safety obligations in line with international conventions for aviation safety. DASF assures that safety of military aviation is both credible and defensible.

Explosives

Aviation

Radiation

Risk decisions regarding capability / safety

Risk advice regarding defensibility and credibility

Defence Aviation Safety Framework

- Defence AA
- DASA
- DASP
- Policy/Regulation
- Promotion/Education
- Initial Safety Case
- Ongoing Assurance
- DASR

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JOINT DIRECTIVE 21/2021

BY THE SECRETARY AND THE CHIEF OF THE DEFENCE FORCE

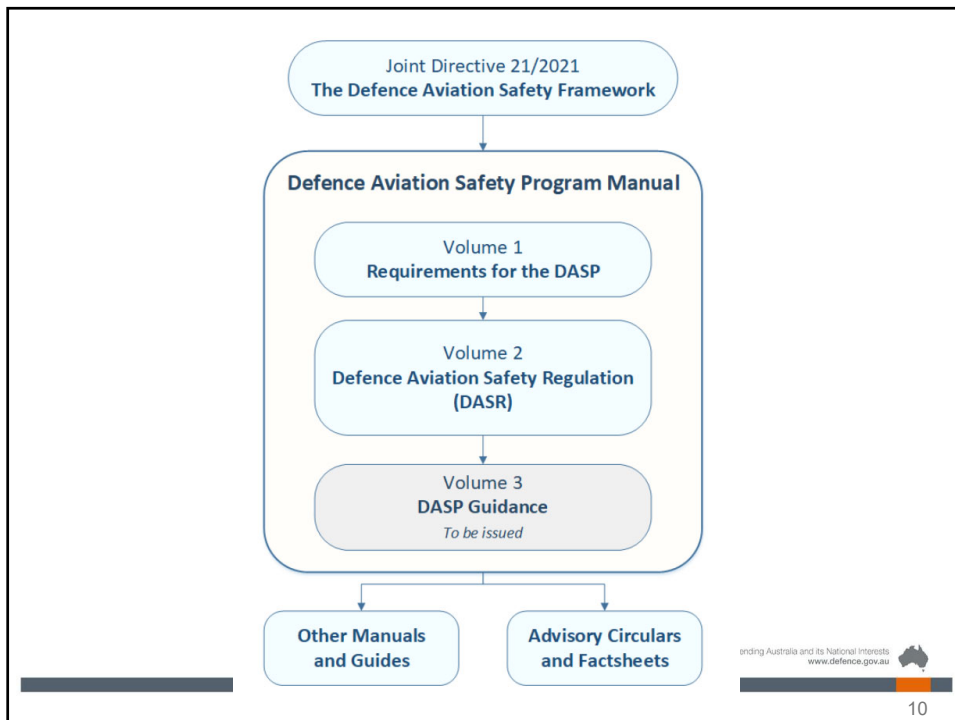
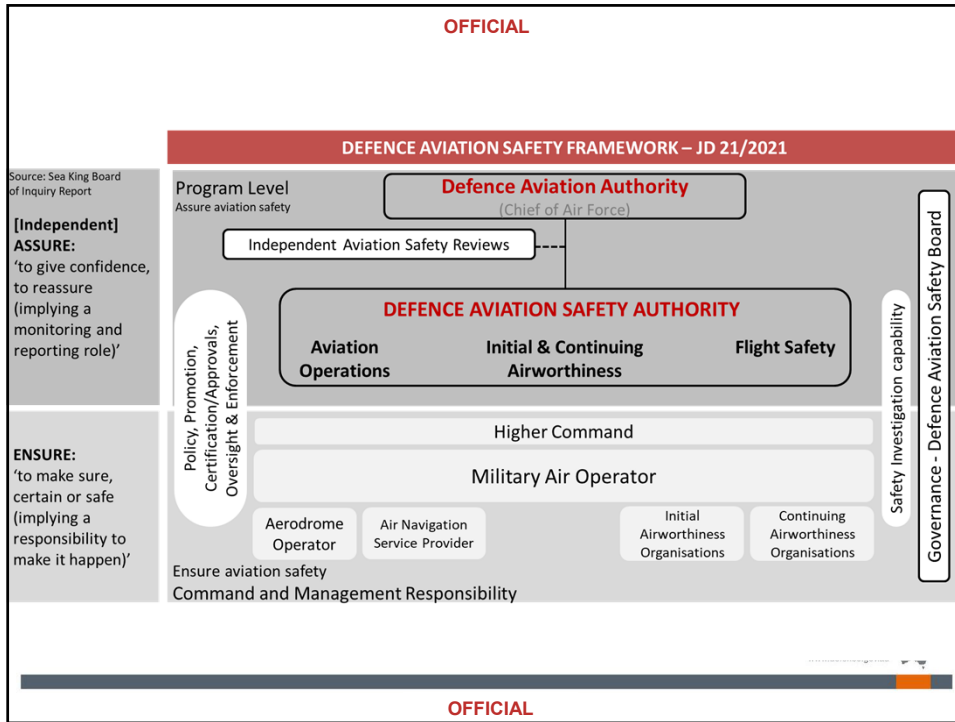
THE DEFENCE AVIATION SAFETY FRAMEWORK

1. Defence has a moral and legal **obligation to ensure risks to the health and safety of personnel** arising from military aircraft operations are **eliminated or otherwise minimised so far as is reasonably practicable**. The basis for these safety obligations is found in Commonwealth work health and safety legislation, and in common law.
2. Military aviation is a unique and complex undertaking that necessitates the **amplification of statutory work health and safety requirements** for the Defence aviation context. This amplification of safety obligations and provision of the means to discharge them is achieved through the adoption of a **structured aviation safety framework**.

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Defence Aviation Safety Regulations (DASR)



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Defence Aviation Safety Regulations (DASR)

- **Airworthiness** DASRs are based on European Military Airworthiness Requirements (EMAR), derived from ICAO based EASA airworthiness regulations:
 - Credible and defensible aviation safety framework
 - Common part and numbering system to EMAR
 - Any unique Australian requirements are in **green** text
 - **AMC** is '**an**' acceptable means of compliance – not the only solution
 - **GM** is non-binding explanatory and interpretation material
- For DASR queries or to recommend changes to DASR:
 - Contact your Quality Management System in the first instance
 - Liaise with DASA Desk Officer
 - Use DASR Query Form or DASR Change Proposal Form

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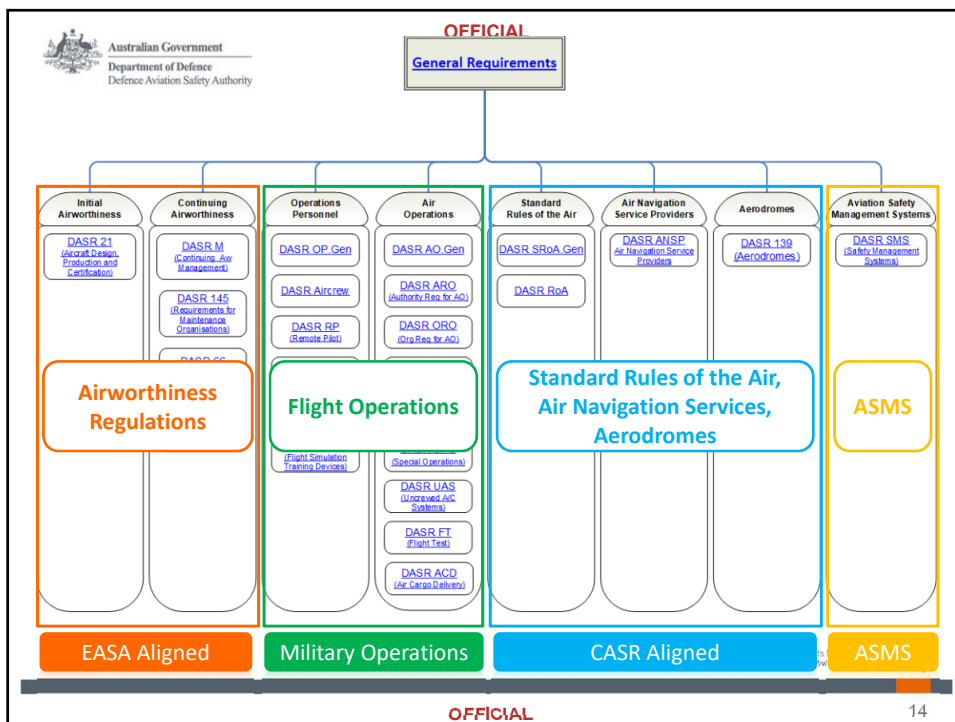
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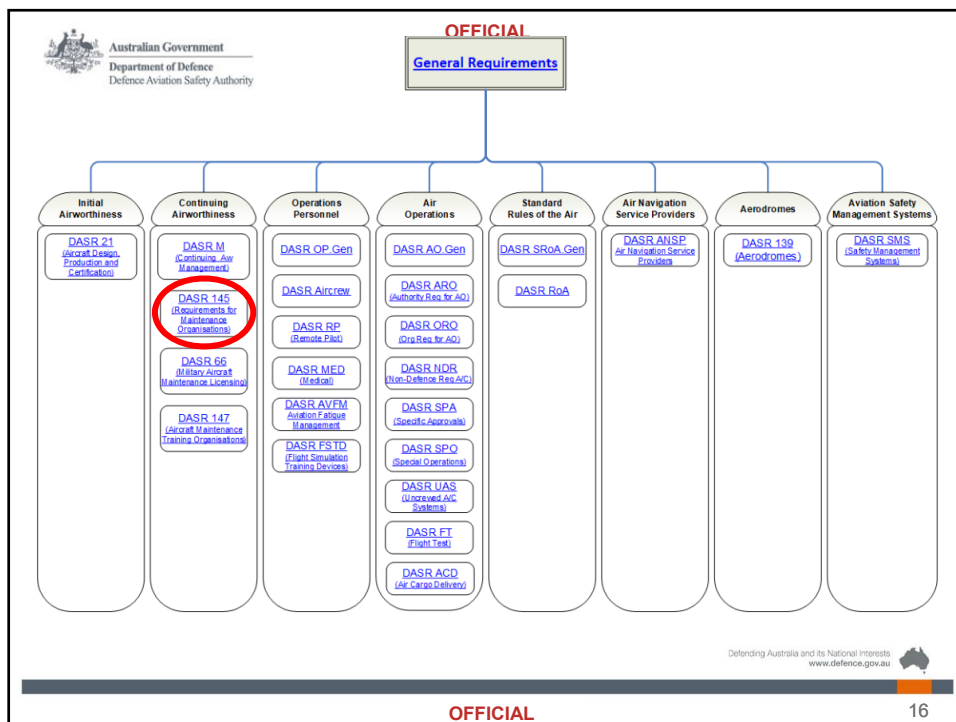
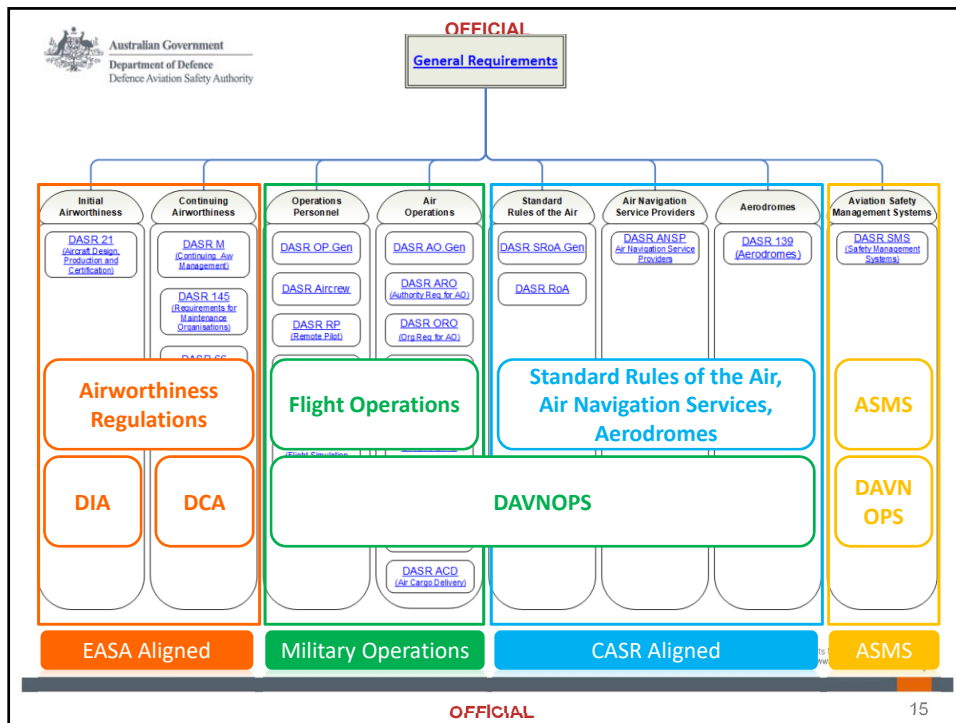
Better Practice Regulation

- DASRs are hazard and (mostly) outcome based regulation
- Hazard based
 - Focus regulation on safety hazards
 - Remove regulation not related to safety hazards
- Outcome based
 - Focus regulation on the outcome needed to treat threats to safety and not the means to achieving the outcome

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Airworthiness Definition


DASR (and EMAR) definition

- The ability of an aircraft, or other airborne equipment or system, to operate in flight and on ground without significant hazard to aircrew, ground-crew, passengers (where relevant) or to other third parties.*

Consistent with EASA use and ICAO definition of “Airworthy”

- The status of an aircraft, engine, propeller or part when it conforms to its approved design and is in a condition for safe operation*

“Focus on the Air Vehicle”

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Initial vs Continuing Airworthiness

Initial Airworthiness (& Continued):

- Type Design
- Certification
- Production
- Design changes post initial type certification

Continuing Airworthiness:


- All of the processes ensuring that the aircraft:
 - complies with airworthiness requirements
 - is in condition for safe operation
 - supported within a ‘**Controlled Environment**’

}

“Type”

}

“Tails”

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Summary

- **Airworthiness** Defence Aviation Safety Regulation (DASR) are based on European Military Airworthiness Requirements
- Better practice regulations should be **hazard and outcome based**
- Command must **ensure** that hazards / risks are eliminated, or otherwise reduced So Far As Reasonably Practical (SFARP)
- Defence Aviation Authority **assures** Defence Aviation Safety
- Defence Aviation Safety Framework is setup through Joint Directive 21/2021

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DASR M Recap

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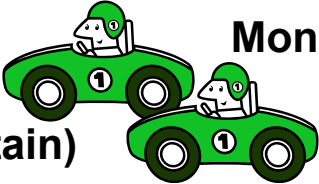
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Do you perform CAMO-like tasks?

- Own and operate a car?
- What are your responsibilities?
- i.e. *'continuing roadworthiness'*

Operate
Fix (maintain)
Scheduled Maintenance



Monitor Performance
Approved Parts
Configuration
Modification

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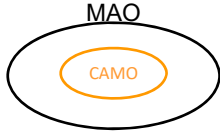
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What is a CAMO responsible for?

On behalf of the 'Military Air Operator' (MAO) the CAMO is to ensure that the various aircraft 'Tail Numbers' are:



- Of the correct Configuration (IAW MTC)
- Available to meet the intended purpose
- Safe to fly

The CAMO does NOT have to actually perform all of these tasks – CAMO services can be contracted

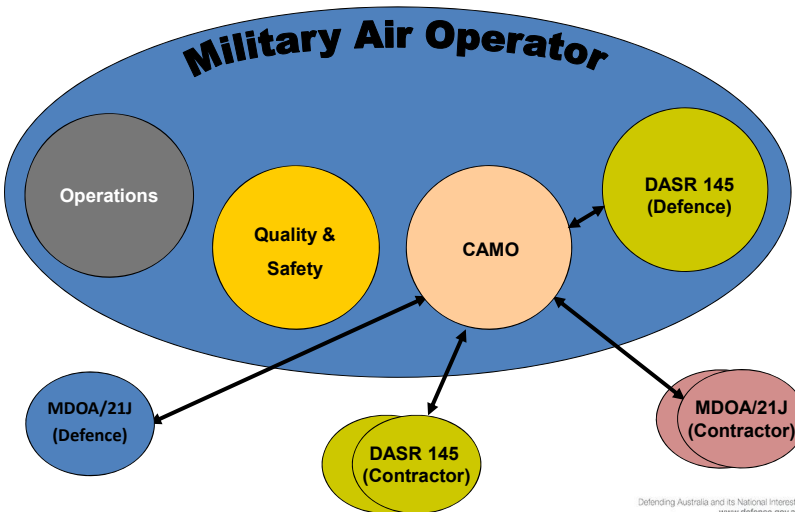
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DASR Organisational Structure




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Why regulate maintenance organisations?

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Case Study – American Airlines Flight 191



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DASR 145

Maintenance Organisations

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Why is DASR 145 Required?

- **M.A.201:** The Operating Organisation is accountable for the continuing airworthiness of an aircraft and shall ensure that no flight takes place unless:
 - the aircraft is maintained in an airworthy condition;
 - ...
 - ...
 - Maintenance of military aircraft, and components thereof shall be carried out by a **DASR 145 AMO, or equivalent**

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DASR 145 Structure

- 145.A.10 Scope
- 145.A.15 Application
- 145.A.20 Terms of approval
- 145.A.25 Facility requirements
- 145.A.30 Personnel requirements
- 145.A.35 Certifying staff and support staff
- 145.A.40 Equipment, tools and material
- 145.A.42 Acceptance of components
- 145.A.45 Maintenance data
- 145.A.47 Maintenance planning
- 145.A.48 Performance of maintenance
- 145.A.50 Certification of maintenance
- 145.A.55 Maintenance records
- 145.A.60 Occurrence reporting
- 145.A.65 Safety and quality policy, maintenance procedures, quality system and Safety Management System
- 145.A.70 Maintenance Organisation Exposition (MOE)
- 145.A.75 Privileges of the AMO
- 145.A.80 Limitations on the AMO
- 145.A.85 Changes to the AMO
- 145.A.90 Continued validity of approval
- 145.A.95 AMO Findings by the NMAA

A photograph of a military helicopter, likely a UH-60 Black Hawk, parked on a tarmac. The helicopter is painted in a camouflage pattern and is viewed from a low angle, showing its rotor blades and landing gear.

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- **145.A.10 - Scope**
 - Establishes the requirements to be met by a maintenance organisation to qualify for the issue or continuation of an approval for the maintenance of aircraft and components
- **145.A.15 - Application**
 - For the issue or change of an approval utilising Form 2. 145.A.85 identifies what requirements define the submission of a Form 2.

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145.A.20 Terms of approval (Scope of Work)

- The Scope of Work will be shown in the organisation's Approval Certificate and is consistent with the Maintenance Organisation Exposition (MOE)
 - The purpose of the Maintenance Organisation Exposition (MOE) is to detail the processes and procedures of the organisation.
- The DASR use a Classification and Rating system (*DASR 145.A.20, Appendix II*) grouped into:
 - A – Aircraft (and any components fitted to the aircraft)
 - B – Uninstalled Engines/APUs
 - C – Uninstalled Components (excluding engines/APUs)
 - D – Specialist Services (NDT and Munitions functions)

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Classifications & Ratings

CLASS	RATING	LIMITATION	BASE	LINE
AIRCRAFT	A1 Aeroplanes/ above 5 700 kg	[State aeroplane manufacturer or group or series or type and/or the maintenance task(s)]	[YES/ NO]*	[YES/ NO]*
	A2 Aeroplanes/ 5 700 kg and below – All ADF fixed wing aircraft are classified as A1 A2 not used	[State aeroplane manufacturer or group or series or type and/or the maintenance tasks]	[YES/ NO]*	[YES/ NO]*
	A3 Helicopters	[State helicopter manufacturer or group or series or type and/or the maintenance task(s)]	[YES/ NO]*	[YES/ NO]*
	A4 Aircraft other than A1, A2 and A3 – Currently not used at this time	[State aircraft series or type and/or the maintenance task(s)]	[YES/ NO]*	[YES/ NO]*
ENGINES/APU	B1 Turbine	[State engine series or type and/or the maintenance task(s)]		
	B2 Piston – Not used as ADF has no piston engine aircraft	[State engine manufacturer or group or series or type and/or the maintenance task(s)]		
	B3 APU	[State engine manufacturer or series or type and/or the maintenance task(s)]		

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Classifications & Ratings


COMPONENTS other than complete engines or APU's	S1000D CHAPTER REFERENCE ¹	LIMITATIONS (aircraft type, component, manufacturer)
C1 Air Cond & Press	21	
C2 Auto Flight	22	
C3 Comms and Nav	23-34-43	
C4 Doors — Hatches	52	
C5 Electrical Power & Lights	24-33-91	
C6 Equipment	25-38-45-50	
C7 Engine — APU	49-71-72-73-74-75-76-77-78-79-80-81-82-83-86	
C8 Flight Controls	27-55-57.40-57.50-57.60-57.70	
C9 Fuel — Airframe	28-48	
C10 Helicopter — Rotors	62-64-66-67	
C11 Helicopter — Trans	63-65	
C12 Hydraulic Power	29	
C13 Indicating - recording system	31-46	
C14 Landing Gear	32-90	
C15 Oxygen	35-47	
C16 Propellers	61	
C17 Pneumatic & Vacuum	36-37	
C18 Protection ice/ rain/fire	26-30	
C19 Windows	56	
C20 Structural	53-54-57.10-57.20-57.30	
C21 Water Ballast	41	
C22 Propulsion Augmentation	84	
C51 Attack systems	39-40-42	
C52 Radar/ Surveillance	92-93	
C53 Weapons systems	94	
C54 Crew escape & Safety	95	
C55 Drones/ Telemetry	96-00, 96-30, 96-40	
C56 Reconnaissance	97-98	
C57 Electronic warfare	99	
D1 Non-Destructive Testing	[State particular NDT method(s)]	
D5 Arms, Munitions and Pyrotechnic Systems Specific	[State arms type and maintained pyrotechnic systems]	

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¹ S1000D Chapter Reference : in conformity with "S1000D Main System Breakdown"

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Line Maintenance

AMC 145.A.10 – Scope


- Line maintenance should be understood as any maintenance that is carried out before flight to ensure that the aircraft is fit for the intended flight. Line maintenance may include:
 - Trouble shooting.
 - Defect rectification.
 - Component replacement with use of external test equipment if required. Component replacement may include components such as engines and propellers/rotors.
 - Scheduled maintenance and/or checks including visual inspections that will detect obvious unsatisfactory conditions/discrepancies but do not require extensive in depth inspection. It may also include internal structure, systems and power plant items which are visible through quick opening access panels/doors.
 - Minor repairs and modifications which do not require extensive disassembly and can be accomplished by simple means.

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Line Maintenance


Your Maintenance Organisation Exposition will list the maintenance activities classed as Line Maintenance

Base Maintenance

Everything else*

If it's not in the MOE's list of Line maintenance activities, then it's Base maintenance

* Component maintenance excluded.

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Advisory Circular 007/2018

Available on the DASA website:
https://dasa.defence.gov.au/pgp#t=ACs_Factsheets.htm



ADVISORY CIRCULAR

AC 007/2018


LINE AND BASE MAINTENANCE

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Questions?



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145.A.25 Facility Requirements

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145.A.25 Facility requirements

- A DASR 145 must have appropriate facilities for the planned maintenance activities, including:
 - Aircraft hangars
 - Component workshops
 - Office accommodation
- The working environment shall be such that the effectiveness of personnel is not impaired. Consider:
 - Temperature
 - Dust
 - Lighting
 - Noise

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145.A.25 Facility requirements (cont.)

- Storage for components, equipment, tools and materials
 - Segregation between serviceable and unserviceable
 - Storage conditions meet manufacturer's requirements
 - Restricted access to authorised personnel

- Hangar visit plan (for aircraft)
 - Hangar availability for planned maintenance
 - Where not owned, proof of tenancy

Military operational needs (deployment etc.) must be accounted for in the MOE.


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Swiss Engineers changing engine on their Boeing 777-300ER in sub freezing temperature in Iqaluit, Canada, while GE technicians placed a heated tent over the engine to enable them to work on it in outside temperatures sometimes lower than -30C (-22F).

Credit: Aviation Week



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145.A.30 Personnel Requirements

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DASR Key Organisational Appointments

	MAO	DASR M (Commonwealth)	DASR 145	DASR 145 (Commercial)
Accountable Officer		Accountable Manager (AM)		Accountable Manager (AM)
Responsible Appointment		Continuing Airworthiness Manager (CAM)	Responsible Manager (RM)	Responsible Manager (RM)
Standards – Processes & People		Quality Manager (QM)		Quality Manager (QM)
Standards - Product		Airworthiness Review (AwR) Staff	NDT RLevel 3	NDT RLevel 3

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145.A.30 Personnel requirements

- **Accountable Manager**
 - The organisation shall appoint an **Accountable Manager** who has **corporate authority** for ensuring that all maintenance can be carried out to the standard required by DASR 145.
 - CEO or Senior Military Commander
 - May be Accountable for more than one organisation
 - **Not required to be knowledgeable on technical matters**

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145.A.30 Personnel requirements

- **Responsible Manager**
 - Responsible to the AM for ensuring that the maintenance organisation complies with DASR 145
 - Can be multiple RMs with different responsibilities
 - **Qualifications:**
 - Engineering degree or diploma
 - **Experience:**
 - 5 years aviation experience
 - CPEng, CEngT or CEngA
 - 2 years experience as staff of DASA or an organisation holding Organisational Approval

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145.A.30 Personnel requirements

- **Quality Manager**
 - Responsible to the AM for monitoring the quality system, including the associated feedback system
 - Direct access to the AM
 - May be QM for MAO, CAMO and MO.
 - **Qualifications:**
 - Diploma of Quality Auditing (or equivalent)
 - **Experience:**
 - 5 years aviation experience
 - 2 years experience as staff of DASA or an organisation holding Organisational Approval
 - 3 years experience in aviation quality management

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DASR Form 4

Application


- Complete DASR Form 4 and supporting evidence (application pack)
- Submit to DASA
- Note: One Form 4 is required for each nominated position

Acceptance

- DASA assessment of application pack against DASR QTE requirements
- Accept / Accept with conditions / Resubmit / Not accepted
- Form 4 returned to applicant

Authorise

- Organisation authorises member to carry out duties of position

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DASR Terminology - 'Deputy'

Example of DASR 145 with Multiple Responsible Managers

```
graph TD; AM[Accountable Manager] --- RM1[Responsible Manager Line Maintenance (*)]; AM --- RM2[Responsible Manager Base Maintenance (*)]; AM --- RM3[Responsible Manager Component Maintenance (*)]; AM --- QM[Quality Manager (*)]; AM --- SM[Safety Manager];
```

(*) Form 4 Required

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Other Possible Arrangements - 'Acting'

Example of DASR 145 with Multiple Responsible Managers

```
graph TD; AM[Accountable Manager] --- ARM[Acting Responsible Manager]; AM --- RM1[Responsible Manager Base Maintenance (*)]; AM --- RM2[Responsible Manager Component Maintenance (*)]; AM --- QM[Quality Manager (*)]; AM --- SM[Safety Manager];
```


(*) Form 4 Required

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145.A.30 Personnel requirements

Maintenance Person-Hour Plans


- The maintenance person-hour plan should show that there is sufficient staff to **plan, perform, supervise, inspect** and **quality monitor** the organisation.
 - At least 50% should be directly employed by the organisation
 - Reviewed every 3 months
 - Reported to AM/QM where there is 25% shortfall
- When staff availability is less than planned, MO shall reassess work intended to be carried out.

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145.A.30 Personnel requirements

- **Specialised Services**
 - If authorised, specialised services staff are not required to be DASR 66 licence holders to perform task sign-off (**note: this is not a CRS**).
 - Personnel who carry out any specialised services shall be appropriately qualified in accordance with officially recognised Standards.
- **Non-Destructive Testing (NDT)**
 - NDT personnel will be qualified in accordance with the European or equivalent Standard recognised by the DASA.
 - **NDT Responsible Level III requires a Form 4.**

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145.A.30 Personnel requirements

Component Maintenance Certifying Staff

- **Not required to be licenced**
- Required to be assessed for (i.e. authorised):
 - Competence
 - Training
 - Experience
- Authorised IAW MOE procedure

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145.A.30 Personnel requirements

Limited aircrew maintenance or ‘One-off approvals’ at remote locations

- By way of **exception** specific requirements exist for limited aircrew maintenance or one-off approvals at remote locations.
- All such cases shall be reported to the DASA within seven days of the issuance of such certification authorisation.
- The organisation issuing the one-off authorisation shall ensure that any such maintenance that could **affect flight safety** is **re-checked** by an appropriately approved organisation

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145.A.35 Certifying staff and support staff

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Licence Categories

Military Aircraft Maintenance Licences (MAML) categories:

- Category A Line Maintenance, minor scheduled, simple defects
- Category B1 Powerplant, Structures, Mechanical Sys, & Electrical Sys
- Category B2 Avionic and Electrical Systems
- Category C Base Maintenance Co-Ordinator



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145.A.35 Certifying staff and support staff

Certifying Staff are:

- **Licensed** by the Authority
- **Authorised** by DASR 145 Maintenance Organisation
 - Ensure MAML holder has an adequate understanding of aircraft, components and procedures
 - Assess MAML holder's competence, qualification and capability to certify maintenance IAW MOE
- Authorisation cannot exceed MAML scope
- Minimum age for certifying staff = 21y.o.
- For more information, refer to DASR 66 Practitioner Course

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145.A.35 Certifying staff and support staff

Ongoing requirements

- Six months of “actual relevant maintenance” in a two year period
- Continuation training programme
 - CT should include technical, procedural and human factors content
- Maintain records for all certifying staff
 - Details of any MAML held under DASR 66 or national equivalent requirement
 - All relevant training completed
 - The scope of the certification authorisations issued
 - Particulars of staff with limited or one-off certification authorisations.

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145.A.40 Equipment, tools and material

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145.A.40 Equipment, tools and material

- Equipment, tools and material (including GSE)
 - Equipment and tools must be permanently available.
 - Alternate tool procedures are to be listed in the MOE.
 - Calibration and associated control processes required.


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145.A.42 Acceptance of components

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145.A.42 Acceptance of components (Definitions)

- **Component** Any engine, propeller, part or appliance.
- **Parts and Appliances** Lower level components for which an AUSMISO may exist, and fitted to a product.
- **Standard parts** used on an aircraft, engine, propeller or other aircraft component accompanied by a manufacturer's declaration of conformity
- **Raw and consumable material** used in the course of maintenance when the maintenance organisation is satisfied that the material meets the required specification and containing a conformity to specification statement plus both the manufacturing and supplier source
- **Fabrication** of a restricted range of parts to be used in the course of undergoing work within its own facilities, or other facilities (MOE).
- **Life limit or non-repairable components** shall be classified as unsalvageable and shall not be permitted to re-enter the component supply system

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145.A.42 Acceptance of components

- All components classified and segregated into:
 - **Satisfactory condition**, DASR Form 1 (or equivalent), IAW Identification of Products, Parts and Appliances (Part 21 Subpart Q)
 - **Unserviceable (including unsalvageable) components:**
 - expiry of the service life limit
 - non-compliance with the applicable ADs
 - absence of the necessary information (to determine the airworthiness status or eligibility for installation)
 - evidence of defects or malfunctions
 - involvement in an incident or accident

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145.A.42 Acceptance of components

- **Unsalvageable** components have reached their **certified life limit** or contain a **non-repairable defect**. A maintenance organisation in consultation with the CAMO/Operating Organisation shall, in the case of unsalvageable components:
 - Retain such components in a secure location under the control of the maintenance organisation until a decision is made on the future status of such component, or
 - Arrange for the components to be mutilated in a manner that ensures they are beyond economic salvage or repair before relinquishing responsibility for such components. By way of exception, a CAMO/Operating Organisation may transfer responsibility of components classified as unsalvageable to an organisation for training or research without mutilation.

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145.A.42 Acceptance of components (Eligibility for fitment)

- A component is eligible to be fitted to a type-certified product, or another part or appliance if:
 - the fitting of the component is permitted by the approved design for the product, part or appliance of the higher assembly;
 - the component is in a serviceable condition for safe operation; and
 - the component has been appropriately released or returned to service.

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Advisory Circular 008/2018

Available on the DASA website:
https://dasa.defence.gov.au/pgp#t=ACs_Factsheets.htm



ADVISORY CIRCULAR

AC 008/2018

ACCEPTANCE OF AIRCRAFT COMPONENTS

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145.A.45 Maintenance Data

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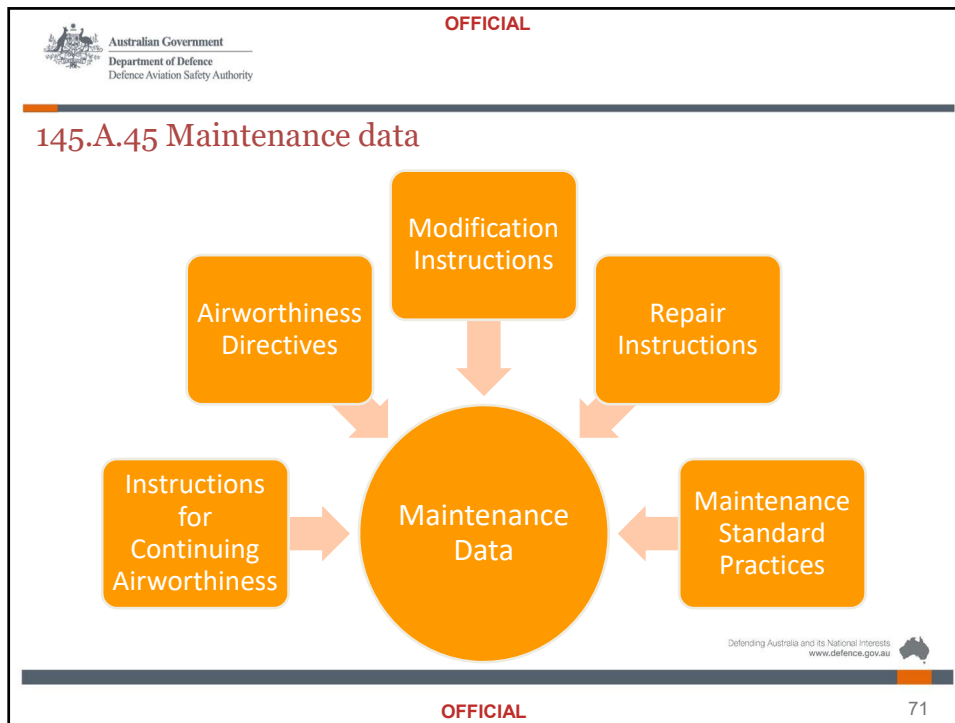
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145.A.45 Maintenance data

- The AMO shall:
 - Have access to and **use** applicable current maintenance data in the performance of maintenance, including modifications and repairs.
 - Establish procedures to ensure that any **inaccurate**, **incomplete** or **ambiguous** maintenance data is recorded and notified to the author
 - Establish a procedure to ensure that the maintenance data it controls is kept up to date.

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145.A.45 Maintenance data

- Maintenance organisations may locally modify maintenance instructions using an approved procedure specified in their Maintenance Organisation Exposition (MOE) only for the purposes of **efficiency**, achieving the intent of the instructions when they are **deficient**, or for the use of **alternative tools/equipment**.
- The maintenance organisation shall demonstrate that the changes result in equivalent or improved maintenance standards.
- A maintenance organisation must notify the MTC holder (or relevant design approval holder) when it has locally modified maintenance instructions, so consideration can be given to amending the master copy for wider distribution. Only the MTC holder or design approval holder can approve amendments to maintenance data.

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145.A.47 Maintenance planning

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145.A.47 Maintenance planning

- AMO must have a system appropriate to the amount and complexity of work to plan the availability of all necessary:
 - Personnel
 - Tooling
 - Equipment
 - Materials
 - Maintenance data
 - Facilities
- Requirement to take into account Human Factors and performance limitations when planning maintenance tasks and shifts
- Shift and task handovers communication to be controlled through a formalised process

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145.A.48 Performance of maintenance

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145.A.48 Performance of maintenance

- Personnel performing maintenance shall be **qualified** and/or **authorised** for the tasks performed
- Maintenance performed using methods, techniques, standards, and instructions as specified in maintenance data
- An independent inspection shall be carried out after any flight safety sensitive maintenance task
- After completion of maintenance a general verification is carried out to ensure the aircraft or component is clear of all tools, equipment and any extraneous parts or material


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145.A.50 Certification of Maintenance

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CAMO Responsibilities


- The CAMO shall coordinate all scheduled and unscheduled maintenance **AND** ensure the work is carried out properly.
- The CAMO shall ensure that all maintenance is released through review of the CRS.

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DASR 145 Maintenance Personnel Responsibilities


The completion and certification of maintenance requires two actions.

They are:

- a task 'sign-off'; and
- a CRS.

In order to prevent omissions, every maintenance task or group of tasks should be signed off.

These two actions may be performed by a singular person or group of people dependent upon task complexity, qualifications and authorisations.

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Task Sign-Off – What?

- It is a statement,
- Signed by an appropriately authorised and competent person, or an appropriately authorised and competent MAML holder, that,
- The maintenance task has been completed, to the standard required, IAW the maintenance data.

Note: Task sign-off can only be accomplished when:

- It is within the scope of the persons authorisation,
- Which is dependent on their QTE, and
- IAW a procedure in the MOE.

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Certificate of Release to Service (CRS) - What?

The CRS is an attestation made by authorised Certifying Staff that:


1. All maintenance ordered/tasked has been properly carried out, IAW maintenance data and the MOE, and
2. There are no non-compliances which are known to affect flight safety.

Achieved through:

1. Oversight and management of the maintenance, and
2. Assessment of the flight safety impact of the completed maintenance.

There are two types of CRS:


- A CRS for **Aircraft**, and
- A CRS for **Components** (Authorised Release Certificate/Form 1)

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Certificate of Release to Service (CRS) – Who?

Line Maintenance

- Category A, B1 or B2 MAML holder

Base Maintenance


- Category C MAML holder

Component Workshop

- Authorised/Qualified competent personnel
- Does not require a MAML

Structures


- Interim Military Maintenance Authority (iMMA) holder (exp. Dec 2023)

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Certificate of Release to Service (CRS) - Aircraft

The aircraft cannot be released to service until there is a CRS(s) covering all required maintenance, which could be:

- any maintenance task.
- any combination of maintenance tasks.
- any maintenance event.

Different combinations of CRS:


- Several CRS are issued, each one of them covering a different single maintenance task.
- Several CRS are issued, each one of them covering a different group of maintenance tasks.
- A single CRS is issued covering all the maintenance included in a maintenance event.

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Certificate of Release to Service (CRS) - Aircraft

The maintenance organisation must have procedures to:


- Ensure that all maintenance is certified
- Report new defects to the CAMO
- Enable management of incomplete maintenance/deferred defects on the basis that:
 - the CAMO and DASR 145 have a procedure to manage the incomplete maintenance/deferred defect
 - A CRS should not be issued when there is incomplete maintenance/deferred defect
- *Exception* - for **Deferred Defects**

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Certificate of Release to Service (CRS) - Aircraft

- Exception (DASR 145.A.50(f)) - when using components without appropriate certification
 - Enable the temporary fitting an aircraft component without appropriate release certificate (if required)

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Certificate of Release to Service (CRS) - **Components**

References: DASR 145.A.50(d), M.A.802

- An Authorised Release Certificate (Form 1 or equivalent) is for return to service of component or aeronautical product (engine, propeller, APU)
- Issued for new and/or repaired components
- All components must have a valid Authorised Release Certificate before fitment to an aircraft
- Authorised Release Certificates are retained and form part of the continuing airworthiness record system
- Components without an Authorised Release Certificate or acceptable alternate, should be considered as unserviceable
- Component Certifying Staff are not required to be Licenced


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Authorised Release Certificate

Raised for Components that have been **Manufactured** (Block 13a)

DEFENCE AVIATION SAFETY AUTHORITY				DASR Form 1	
1. Approving NMAA  Australian Government Department of Defence		2. AUTHORISED RELEASE CERTIFICATE		3. Form Tracking Number:	
4. Approved Organisation Name and Address:				5. Work Order/Contract/Invoice	
6. Item	7. Description	8. Part Number	9. Qty	10. Serial Number	11. Status/Work
12. Remarks					
13a. Certifies that the items identified above were manufactured in conformity to: <input type="checkbox"/> approved design data and are in a condition for safe operation <input type="checkbox"/> non-approved design data specified in Block 12			14a. <input type="checkbox"/> DASR 145 A. 50 Release to Service <input type="checkbox"/> Other regulation specified in Block 12 Certification Statement Certifies that unless otherwise specified in Block 12, the work identified in Block 11 and described in Block 12, was accomplished in accordance with DASR 145 and in respect to that work the items are considered ready for release to service.		
13b. Authorised Signature		13c. Approval/Authorisation Number	14b. Authorised Signature <small>(Electronic signature on file)</small>		14c. Approval/Authorisation Number
13d. Name		13e. Date (dd/mm/yyyy)	14d. Name		14e. Date (dd/mm/yyyy)

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Authorised Release Certificate

Raised for components following **Completion of Maintenance** (block 14a)

DEFENCE AVIATION SAFETY AUTHORITY					DASR Form 1
1. Approving NMAA Australian Government Department of Defence	AUTHORISED RELEASE CERTIFICATE		2. 3. Form Tracking Number:		
4. Approved Organisation Name and Address:				5. Work Order/Contract/Invoice:	
6. Item	7. Description	8. Part Number	9. Qty	10. Serial Number	11. Status/Work
12. Remarks					
13a. Certifies that the items identified above were manufactured in conformity to: <input type="checkbox"/> approved design data and are in a condition for safe operation <input type="checkbox"/> non-approved design data specified in Block 12			14a. <input type="checkbox"/> DASR 145 A.50 Release to Service <input type="checkbox"/> Other regulation specified in Block 12 Certification Statement Certifies that unless otherwise specified in Block 12, the work identified in Block 11 and described in Block 12, was accomplished in accordance with DASR 145 and in respect to that work the items are considered ready for release to service		
13b. Authorised Signature		13c. Approval/Authorisation Number	14b. Authorised Signature <small>(Electronic signature on file)</small>		14c. Approval/Authorisation Number
13d. Name		13e. Date (dd/mm/yyyy)	14d. Name		14e. Date (dd/mm/yyyy)

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Summary

- DASR Completion of maintenance requires two actions:
 - A task 'sign-off'
 - CRS
- Any reference to 'Certification' in DASR M, 145 and 66 only refers to CRS
- Line Maintenance – A / B1 / B2 Category MAML holder
- Base Maintenance – C Category MAML holder
- Component Maintenance – Qualified and authorised personnel (no MAML required)
- A CRS shall be issued before flight at the completion of maintenance
- Refer to AC 005/2020 for more information


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145.A.55 Maintenance Records

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145.A.55 Maintenance records


- **Recording of maintenance work**
 - The organisation shall record all details of maintenance work carried out. As a minimum, the organisation shall retain records necessary to prove that all requirements have been met for issuance of the certificate of release to service, including all release documents.
- **Maintenance records reporting requirements to the CAMO**
 - Copies of each certificate of release to service will be forwarded to the CAMO, together with any specific approved repair/modification data
- **Retention and storage of maintenance records**
 - All maintenance records will be retained for three years*, protected from damage, alteration and theft. All computed back-ups will be stored in a different location in an environment that ensures they remain in good condition.
- **Maintenance authority termination**
 - Where an organisation terminates its operation, retained maintenance records shall be distributed to the responsible CAMO

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145.A.60 Occurrence Reporting

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Occurrence Reporting



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Occurrence Reporting

- The DASR 145 is required to report to DASA any condition which endangers flight safety or may result in an **unsafe condition**.
 - DASR 145 will typically inform the CAMO of occurrences
 - The report can be made on a [DASR Form 44](#) or in a manner as described in the MOE
- The objectives of occurrence reporting are:
 - To enable assessment of safety implications, including what happened, why it happened and what could prevent recurrence
 - To ensure knowledge of occurrences is disseminated
 - To complement existing systems and identify where controls have failed
 - To keep a record of past occurrences for future reference

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Occurrence Reporting

- Accidents and Serious Incidents shall be notified to DASA ASAP. All other occurrences shall be reported as soon as practical but within **72 hours**.
- AMC to General Requirement 40 lists possible reportable occurrences:
 - Section I Aircraft Flight Operations
 - Section II Aircraft Technical
 - Section III Aircraft Maintenance and Repair
 - Section V Immediate Notification of Accidents and Serious Incidents

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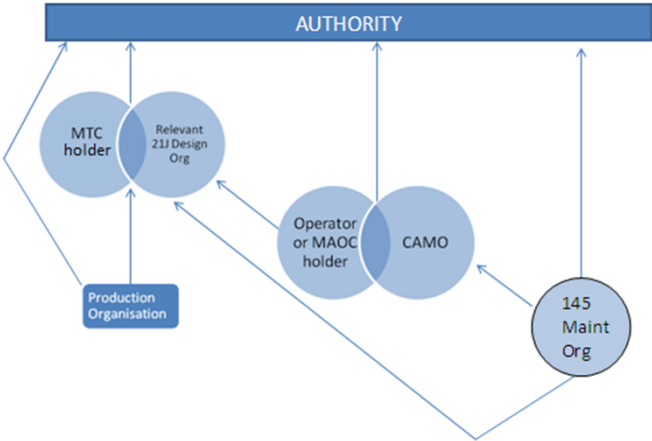
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Occurrence Reporting Flow

SIMPLIFIED REPORTING LINES



```

    graph TD
      MTC((MTC holder)) --> AUTH[AUTHORITY]
      Design((Relevant 211 Design Org)) --> AUTH
      Operator((Operator or MAOC holder)) --> AUTH
      CAMO((CAMO)) --> AUTH
      Maint((145 Maint Org)) --> AUTH
      Production[Production Organisation] --> Design
      Design --> Operator
      Operator --> CAMO
      CAMO --> Maint
      Maint --> AUTH
    
```

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145.A.65 ASMS and QMS

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145.A.65 Safety and quality policy, maintenance procedures, quality system and safety management system

- The maintenance organisation shall establish a safety and quality policy for the organisation to be included in the MOE
 - Policy should include a statement committing the AMO to recognise safety as a prime consideration at all times, encourage open reporting and compliance with procedures.
- The maintenance organisation shall establish procedures to ensure
 - Risk of multiple errors during maintenance being repeated in identical maintenance tasks minimised
 - Damage is assessed and modifications and repairs are carried out using data specified in M.A.304

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Quality Management System


Reference: 145.A.65(c)-(d)

- The AMO shall establish a QMS that includes:
 - **Independent audits** in order to **monitor compliance** with required aircraft/aircraft component standards and **adequacy of the procedures** to ensure that such procedures invoke good maintenance practices and airworthy aircraft/aircraft components
 - A **quality feedback reporting system** to the Accountable Manager that ensures proper and timely corrective action is taken following audits
- The AMO shall ensure that its personnel have access to quality system documentation and are knowledgeable of procedures relevant to their function.

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Aviation Safety Management System

- ASMS
 - The organisation shall establish and maintain an aviation safety management system IAW DASR SMS


- An organisation's ASMS will include the following four components:
 - Safety policy and objectives
 - Safety risk management
 - Safety assurance
 - Safety promotion.

- For more information contact dasa.dasr@defence.gov.au

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145.A.70 Maintenance Organisation Exposition

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145.A.70 Maintenance Organisation Exposition (MOE)

- The MOE is the document or documents that defines the scope of work for how the organisation intends to comply with DASR 145.
 - MOE is approved by DASA
- There can be more than one acceptable format for a MOE.
- DASR 145.A.70(a) contains the minimum requirements of the information that makes up a MOE.

Have you seen your organisation's MOE?

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145.A.70 Maintenance Organisation Exposition (MOE)

- The MOE and its amendments shall be approved by DASA.
- Minor amendments may be approved through an indirect approval procedure
 - Indirect approval procedure defines the **scope** and **procedure** used for minor amendments.
- MOE Tips:
 - Write the MOE such that new personnel can easily understand how the AMO works
 - Before making changes, consider **'WHAT'** the DASR outcome is, **'HOW'** you plan to comply and **'WHO'** is responsible
 - Make it a useful document for **your** organisation.

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145.A.75 Privileges of the AMO

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145.A.75 Privileges of the AMO

- Maintain any aircraft and/or component for which it is approved at the locations identified in the approval certificate and in the MOE

- Subcontracting of maintenance
 - Arrange for maintenance at another organisation that is working under the quality system of the organisation.
 - This shall not include a base maintenance check of an aircraft or a complete workshop maintenance check or overhaul of an engine or engine module

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145.A.75 Privileges of the AMO – cont'd

- Away-base maintenance
 - Perform maintenance any location subject arising either from the un-serviceability of the aircraft or from the necessity of supporting occasional line maintenance
 - Perform maintenance at another location identified as a line maintenance location capable of supporting minor maintenance and only if the MOE both permits such activity and lists such locations
- Issue CRS on completion of maintenance ordered by a CAMO.

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145.A.80 Limitations of the AMO

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145.A.80 Limitations on the AMO

- The organisation shall only maintain an aircraft or component for which it is approved when all the necessary
 - facilities,
 - equipment,
 - tooling, material,
 - maintenance data and
 - certifying staffare available.

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145.A.85 Changes to the AMO

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145.A.85 Changes to the AMO

- The following significant changes shall be notified to DASA to enable determination of continued compliance with the DASR 145 and to amend, if necessary, the approval certificate:
 - Organisation name
 - Changes to the organisations location or additional locations
 - Accountable Manager and all appointed deputies;
 - Management Team and their appointed deputies;
 - Facilities, equipment, tools, material, procedures, work scope or certifying staff that could affect the approval.
 - The ownership of the organisation or its parent company.


- The AMO should notify DASA of any changes using **DASR Form 2**.

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145.A.90 Continued Validity of Approval

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145.A.90 Continued validity of approval

- An approval shall be issued for an unlimited duration. It shall remain valid subject to:
 - Remaining compliant with DASR 145 and satisfactory handling of findings
 - DASA being granted access
 - Certificate of approval has not been surrendered or revoked
- Surrender or Revocation
 - Upon surrender or revocation, the approval shall be returned to the DASA

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145.A.95 AMO Findings by the NMAA

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DASA Oversight and Enforcement Process

- Approved organisations are required to grant access to DASA for conduct of Oversight and Enforcement (O&E) activities
 - In most cases, DASA will coordinate with the organisation to arrange the visit
- Discoveries made during the O&E activity will be made known to the organisation and formally reported in the post visit assessment
- Post visit, DASA personnel will internally consult to agree on the level of enforcement action required (e.g. observation, etc.)

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Findings by the NMAA (DASA)

Levels of findings:

- **Level 1** – any non-compliance with the DASR requirements which lowers the safety standard and seriously hazards flight safety.
- **Level 2** – Is any non-compliance with the DASR requirements which lowers the safety standard and possibly hazards flight safety.
- **Level 3** – Any non-compliance or potential non-compliance, identified by objective evidence, which could lower the safety standard and possibly hazards flight safety.

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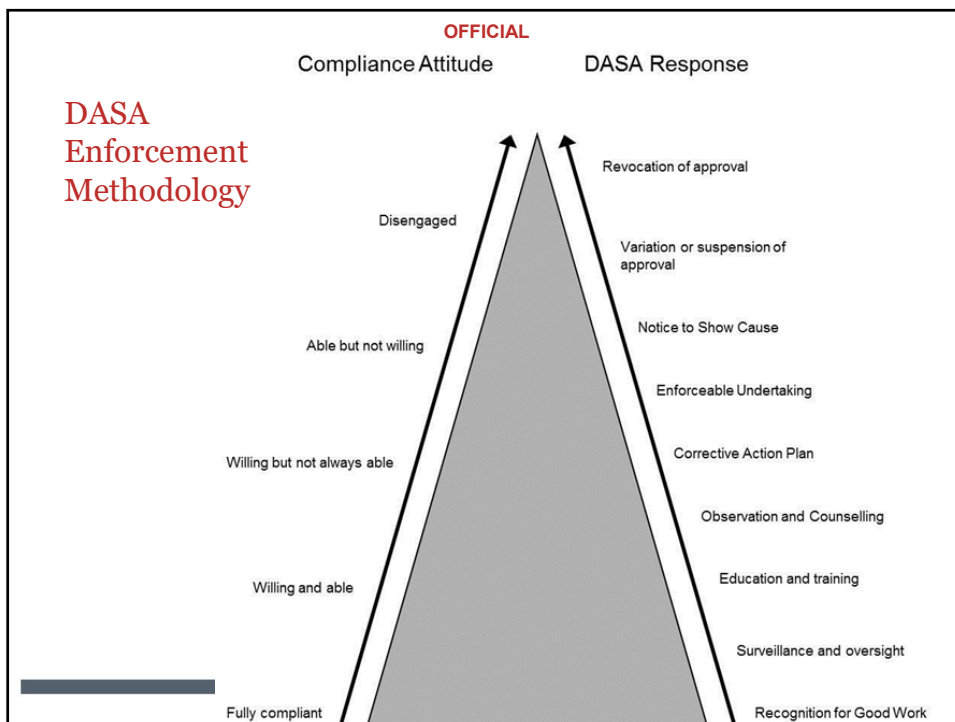
145.A.95 AMO Findings by the NMAA

- After receipt of notification of a level 1 or 2 finding, the DASR 145 shall:
 - identify the root cause of the non-compliance;
 - define a corrective action plan; and
 - demonstrate corrective action implementation to the satisfaction of DASA within a period required by DASA.
- DASA has some flexibility in selection of finding level as it is dependant on the degree that the hazard endangers flight safety and the attitude of the organisation in addressing the hazard.

A 145's non-compliance with the actions above leads to a full or partial suspension of the approval by DASA.

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Management of Defects (Common to DASR M Practitioner)

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Management of Defects

References: *DASR 145.A.50(e), M.A.301(a)(2) and 708(b)(6)*


- The CAMO shall ensure that:
 - all defects discovered or reported, are managed appropriately until corrected by a DASR 145
 - there are options for deferment
- The DASR 145 shall comply with the CAMO's defect management system IAW the CAME and in consultation with the CAMO

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Management of Defects


- To meet the demands of operational availability, where it is not reasonably practicable to:
 - rectify the defects,
 - provide life extensions or
 - obtain approved repairs,
- Deferring the defect may be considered. In these cases, it may be appropriate for the CAMO to defer defects subject to a deferment period using **credible data**.

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Management of Defects – Credible Data


- Credible data is considered to be any instructions or information resources defined by the CAMO in the NMAA approved CAME that is required to retain the aircraft and/or related equipment in a condition for safe flight.
- The CAMO should articulate in the CAME who can use credible data.
- Credible data may include:
 - MEL/CDL
 - Maintenance Data as defined by DASR 145.A.45(b)
 - OEM publications / Type certification data
 - Designs or advice from the relevant design approval holder
 - Field Service Representative data
 - Flight operations advice

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MEL or CDL Method (if available)

- **Master Minimum Equipment List (M MEL)** – Established for a particular aircraft type by the manufacturer. It identifies items which, individually, may be unserviceable at the commencement of a flight.
- **Minimum Equipment List (MEL)** – This list is prepared by the operator for their own aircraft, taking into account their aircraft configuration and the relevant operational and maintenance conditions.
- **Configuration Deviation List (CDL)** – Similar to MEL, but refers to external components that are missing/uninstalled and may have associated *operating limitations and/or performance corrections*.

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MEL or CDL Method (if available)

Using the MEL/CDL:

- The Operating Organisation develops the MEL/CDL which is approved by DASA
 - AC 007/2021 - MMEL and MEL Development and Approval
- The approved MEL/CDL can be used as credible data to defer a defect
- Defect deferral is approved by the CAMO, using the CAMO's defect deferral procedure
- The deferred defect is documented in the aircraft technical log.


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Aircraft Type: DEHAVILLAND DHC-8 Aircraft Registration Mark: VH-ABC	Revision No. 13 Date: 1 August 1999	Page 27-1-1
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1. ATA System and Item Sequence Numbers	2. NUMBER INSTALLED	3. NUMBER REQUIRED FOR DISPATCH								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">27 FLIGHT CONTROLS</th> <th style="width: 40%;">CAT</th> </tr> </thead> <tbody> <tr> <td>-1. Stall Warning System Pressure Indicator</td> <td style="text-align: center;">A</td> </tr> <tr> <td>-1. Pressure Indicator</td> <td style="text-align: center;">2</td> </tr> </tbody> </table>	27 FLIGHT CONTROLS	CAT	-1. Stall Warning System Pressure Indicator	A	-1. Pressure Indicator	2	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 50%; text-align: center;">1</td> <td style="width: 50%; text-align: center;">1</td> </tr> </tbody> </table>	1	1	4. REMARKS OR EXCEPTIONS (O) (M) One may be inoperative provided the system is deactivated. NOTE: Deactivating a stall warning system will deactivate the related FAST SLOW indication on the ADI.
27 FLIGHT CONTROLS	CAT									
-1. Stall Warning System Pressure Indicator	A									
-1. Pressure Indicator	2									
1	1									
Placard None required as a lit STALL WARNING caution light on the affected side indicates malfunction. A placard may be required regarding non-availability of FAST/SLOW indication on the ADI.										
Operating Procedures Prior to flight, test integrity of the STALL WARNING system by selecting the STALL WARNING TEST										
Maintenance Procedures <ol style="list-style-type: none"> Pull the "STALL WRN & HTR" and "STALL XDCR HTR" circuit breakers for the affected side. <ul style="list-style-type: none"> Left Side: "STALL WARN & HTR 1" on left DC circuit breaker panel (L7). "STALL XDCR HTR 1" on variable frequency AC circuit breaker panel (left bus). Right Side: "STALL WARN & HTR 2" on right DC circuit breaker panel (R7). "STALL XDCR HTR 2" on variable frequency AC circuit breaker panel (right bus). Make appropriate entry in the aircraft maintenance records. 										

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Management of Defects – ‘Endanger Flight Safety’

Reference: DASR AMC1 to 145.A.50(a)

- Requires a technical assessment by DASR 145 staff and agreement by the CAMO for deferral.
- Authorised certifying staff conduct an assessment to determine if the defect ‘endangers flight safety’. Note ‘authorised certifying staff’ is used indicating the certifying staff are required to be specifically authorised to defer defects.
- Definition of endangers flight safety:
 - *‘Endanger flight safety’ means any instance where safe operation could not be assured or which could lead to an unsafe condition. It typically includes, but is not limited to, significant cracking, deformation, corrosion or failure of primary structure, any evidence of burning (including overheating), electrical arcing, significant hydraulic fluid or fuel leakage and any emergency system or total system failure. An AD overdue for compliance is also considered a hazard to flight safety.’*

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Management of Defects – ‘Endanger Flight Safety’

- If the defect does not ‘endanger flight safety’ the decision is then passed to the CAMO for agreement to defer the defect in accordance with the procedure approved in the CAME.
- If the CAMO agrees to the deferment, the DASR 145 may raise a deferred defect subject to details of the deferment, including the CAMO’s agreement, being endorsed on the certificate.
- The CAMO must ensure that deferred defects are documented in the continuing airworthiness record system, including the deferment period and any associated limitations/restrictions

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Management of Defects – CAMO

- If assessment determines the defect **does** (or may) 'endanger flight safety' and is referred to the CAMO, the CAMO can:
 - Task a DASR 145 to rectify the defect.
 - Provide a life extension to the maintenance interval IAW GM M.A.301(a)(3).
 - Seek an approved repair (may be unrepaired damage) from a Military Design Organisation (MDO), who will issue an approved repair and/or modified flight conditions.
 - Seek a Military Permit to Fly (MPTF) per the requirements of DASR 21 Subpart P
 - Utilise Command Clearance IAW DASR SPA.10

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Command Clearance

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Command Clearance

Reference: DASR SPA.10


- The use of the MEL/CDL and Credible Data to assess defects under CAMO management are covered under Initial/Continued/Continuing Airworthiness approvals (DASR M/145) and instruments (Designs/MPTF) subject to DASA approval and issue.
- The Command Clearance is an instrument authorised via the command chain.
- Provides a risk-based approach to allow aircraft to be operated outside their approved configuration, role, environment, limitations or conditions.
- Legal obligation remains to ensure risks to the health and safety of personnel are managed SFARP.

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Command Clearance

- The CAMO engages the Military Air Operator (MAO) to seek a Command Clearance.
- MAO conducts risk assessment and issues Command Clearance.
- Command Clearance provides the authority to operate the aircraft in an unairworthy condition, and allows the CAMO to defer the defect.
- Such judgements must be made at the appropriate command level to ensure that aviation safety risks are eliminated or otherwise minimised So Far As is Reasonably Practicable (SFARP).

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Command Clearance

- The MAO must maintain a Command Clearance management system for approval to operate an aviation system outside the system's configuration, role, environment, limitation or condition.
- The Command Clearance management system shall specify requirements for the completion of a risk assessment (SFARP) prior to issue of a Command Clearance.
- Command Clearance management system should be a formal, documented process. The MAO must ensure records of Command Clearances decisions are available to the Authority.


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DASR 145 Summary

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DASR 145 Summary

1. The CAMO is responsible for (but does not have to perform) all CAM functions and tasks
2. DASR 145 approved organisation performs maintenance according to CAMO tasking
3. The Scope of Work is shown in the organisation's Approval Certificate and is consistent with the Maintenance Organisation Exposition (MOE)
4. Line vs Base Maintenance is described in the MOE
5. There are Facility and Personnel requirements for a 145 organisation
6. Acceptance of components, maintenance data and the certification of maintenance are covered by the 145 organisation
7. There are privileges and limitations to any 145 organisation
8. There are options for the deferment of defects

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