

Military Air System Certification Process Essentials

MACP Introduction

- What is an Air System and what is certification?
- When was Certification established and why do we need it?
- The Military Aviation Authority (MAA)
- Military Air System Certification Process (MACP)
- Regulatory Publications and where to find them
- What is an MCRI? (Military Certification Review Item)
- The importance of safety and implications
- Relationship between Certification and the Health and Safety at Work Act 1974



Sources For Acronyms

Military Aviation Authority Master Glossary
[MAA02: Military aviation authority \(MAA\) master glossary - GOV.UK \(www.gov.uk\)](#)

[Manual of Military Air System Certification \(MMAC\) - GOV.UK \(www.gov.uk\)](#)

What is an Air System?

The Aircraft (whether Crewed or Uncrewed) and associated components vital to their safe operation. This may include components not on the Aircraft itself - MAA 002 : MAA Master Glossary

For example, for an Uncrewed Air System -UAS, the Remote Pilot Station and datalinks essential for control of the Aircraft would be part of an Air System.



What is Certification?

“The systemic, independent Airworthiness process used to demonstrate that the Type Design of an Air system (or Product, Part or Appliance) meets the applicable Airworthiness requirements, as agreed with the Certifying authority.”

MAA02 : MAA Master Glossary



Certification addresses **Airworthiness** and not the operational effectiveness of an air system.

Why is Certification Needed and When?

The process applies to all air systems:

- On **initial entry to service**
- For all **changes to the Type Design** during the in-service phase

These changes may be associated with:

- Configuration (design changes)
- Usage
- Air System Document Set (ADS)
- Maintenance philosophy





When and Why was the current Military Air System Certification (MASC) Process Established?

- Nimrod XV230 incident in 2006 resulted in the Haddon-Cave QC review, 2009.



- The Military Aviation Authority (MAA) - *Independent Regulator*
- Military Air System Certification Process (MACP)
- MAA Regulatory Publications (MRP).

The Military Aviation Authority

“A Military Airworthiness Authority shall be established as soon as practicable which comprises the single regulator authority.”
Haddon-Cave review

The MAA is:

- The UK Aviation Defence Regulator
- Responsible for **Regulation and Certification, Assurance and Enforcement**
- Part of the Ministry of Defence and the Defence Safety Authority

The MAA has three organisational areas:

- The Regulation and Certification Group
- The Operating Assurance Group
- Chief of Staff Area.

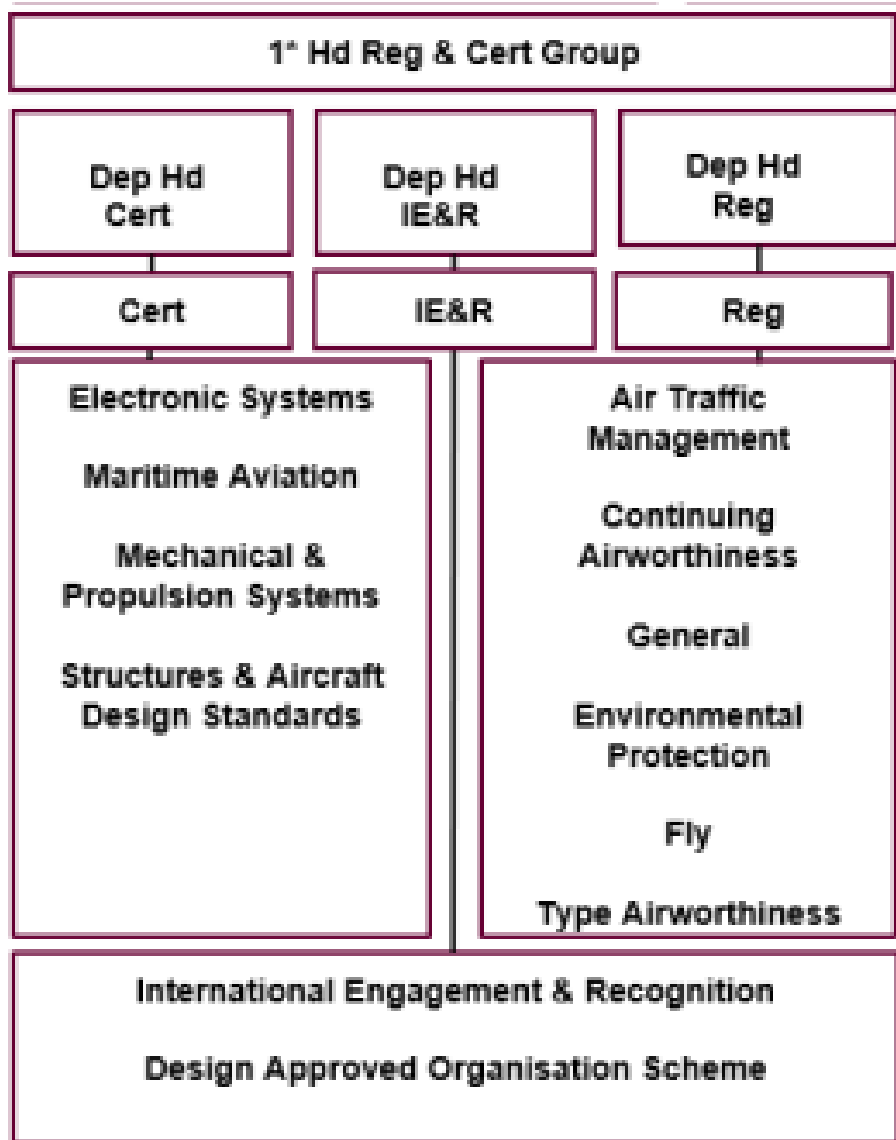


“To be a world leading Air Safety Regulator” [MAA Website]

MAA - Regulation and Certification Group Responsibilities

- Regulation and Certification Group
 - Development, Maintenance and promulgation of Regulations, Standards and associated publications
 - Certification of all new military Air Systems and major changes to Type Design
 - Design Approved Organization Scheme (DAOS)
 - Type Airworthiness Authority (TAA)/Type Airworthiness Manager (TAM) assessments and LOE approval.
- International Engagement and Recognition Team
 - Recognition: Comparative review of another National MAA's processes

[MAA01: Military Aviation Authority \(MAA\) regulatory policy](#)



MAA Organization



- **Operating Assurance Group**
 - Assurance of platforms and organizations which affect Air Safety and Environmental Protection
 - Manages the Military Aircraft Register (MAR)
 - Approved Organization Schemes (excepting DAOS) and endorses key individuals

- **Chief of Staff Area -**
 - Strategic Development and Command Plans
 - Business Compliance
 - Resource Management
 - Quality management
 - Training, both external (Air Safety Training) and internal (individual mandated training).
 - Legal advice across all areas of the MAA.



[MAA01: Military Aviation Authority \(MAA\) regulatory policy](#)

Military Air System Certification Process (MACP)



The MACP provides a framework and process for establishing:

- The **standard** to which a system will be evaluated
- The qualification and experience of the **people and organisations** involved
- The **evidence** required for **validation**
- The presentation of the evidence for **independent verification**
- **Issue** of a suitable Certificate.

Military Air System Certification Process Phases



Phase 0 - Planning

Phase 1 - Organizational Approvals

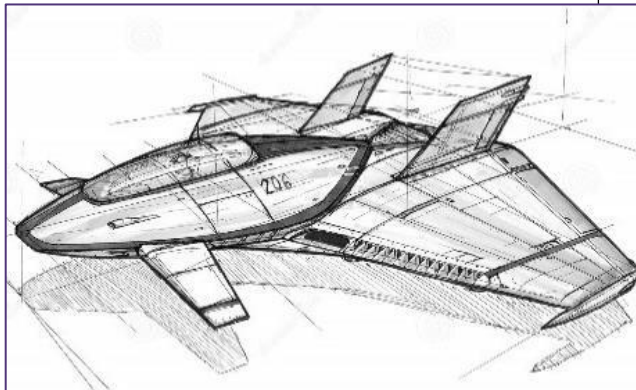
Phase 2 - Type Certification Basis

Phase 3 - Certification Programme

Phase 4 - Demonstrate Compliance

Phase 5 - Report & Certification

Phase 6 - MACP Actions



[Manual of Military Air System Certification \(MMAC\) - GOV.UK \(www.gov.uk\)](http://www.gov.uk)

MACP - Ground Rules



- The process is not ‘serial’, but it is **sequential**
- Regular **communication** with wider stakeholders is essential
- Process **iterates** multiple times through the **life** of the air system
- The MACP is described in the **Manual of Military Air System Certification** (MMAC)
- Air Engineering Tool (AET) Process 8 – Certification: **Guidance and templates.**

[Manual of Military Air System Certification \(MMAC\)](#)
[- GOV.UK \(www.gov.uk\)](#)

MAA Regulatory Publications (MRP)

The **MAA is the owner of the MRP** and exercises authority to issue it for the Director General of the Defence Safety Authority (DG DSA) on behalf of the Secretary of State for Defence.

MRP applies to the following activities:

- Flying operations;
- Air Traffic Management;
- Continuing Airworthiness engineering and maintenance;
- Type Airworthiness engineering; and
- Other systems, personnel and activities that may have an impact on Air Safety.



The MRP is equally applicable to both the MOD and organizations under contract for them.

The MRP

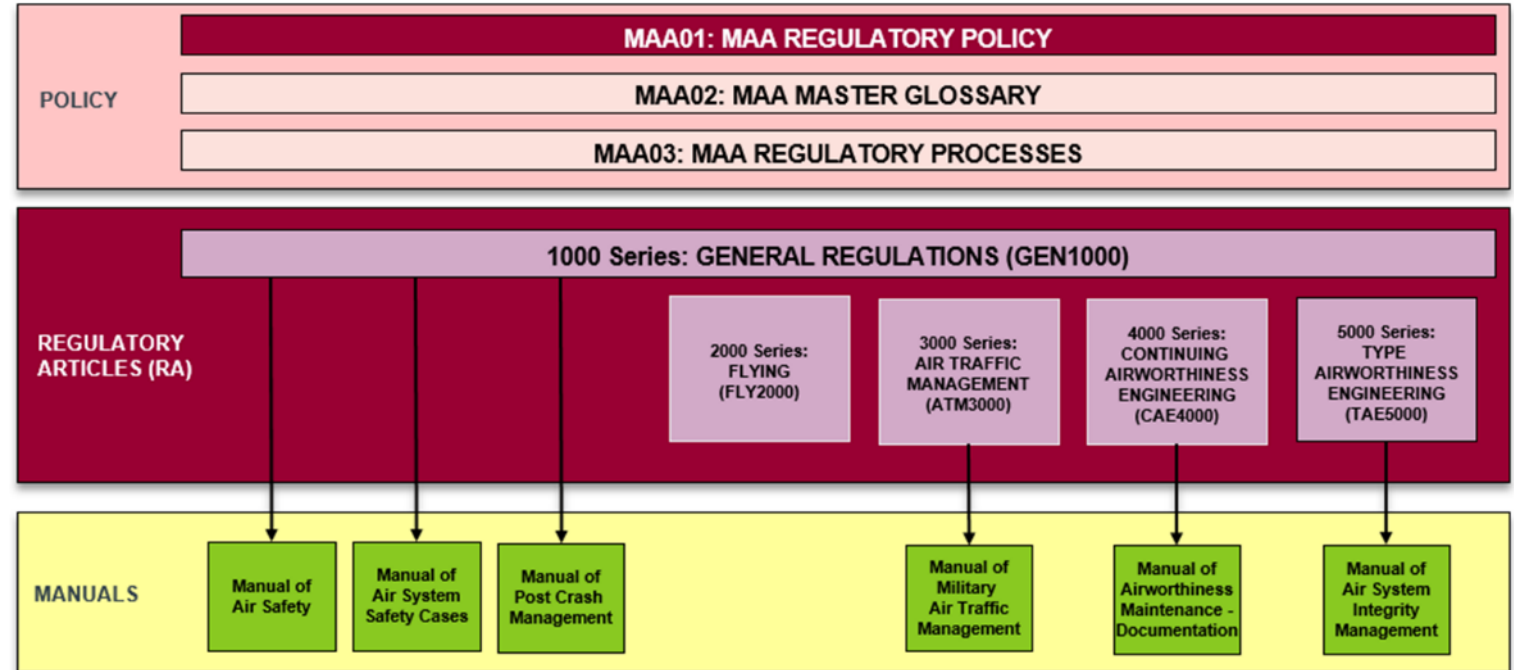
The MRP provides the Air Safety and Airworthiness principles and policy for the regulation of aircraft on the UK Military Aircraft Register.

The MRP is split into three layers:

- Policy
- Regulatory Articles (RA)
- MAA Manuals

In addition to:

- Regulatory Instructions
- Regulatory Notices



The MRP in full is found on the MAA website.

[MAA Regulatory Publications](#)

How to find the MRP Documents - MRP Webpage

Collection

MAA regulatory publications

Military Aviation Authority regulatory publications (MRP) which include overarching documents, Regulatory Articles (RA) and manuals.

From: [Ministry of Defence](#) and [Military Aviation Authority](#)

Published 11 November 2014

Last updated 25 April 2019 — [See all updates](#)

Contents

- [Regulatory amendments](#)
- [Regulatory notifications](#)
- [Related information](#)
- [Related documentation](#)

The MAA regulatory publications (MRP) are split into 3 layers:

- [Overarching documents](#), which includes:
 - [MAA01: MAA regulatory policy](#)
 - [MAA02: MAA master glossary](#)
 - [MAA03: MAA regulatory processes](#)
- Regulatory Articles (RA), separated into 5 series:
 - [1000 series \(GEN\)](#)
 - [2000 series \(FLY\)](#)
 - [3000 series \(ATM\)](#)
 - [4000 series \(CAE\)](#)
 - [5000 series \(TAE\)](#)
- [MAA Manuals](#), which includes:

Regulation contact information

Email: DSA-MAA-MRPEnquiries@mod.gov.uk

Telephone: +44 (0)30679 38269

Address:

MAA regulation enquiries
Juniper 1, Abbey Wood North
Bristol
BS34 8QW

Regulatory amendments

As part of the MAA regulation amendment process proposed and authorized changes are published to enable feedback to Proposed Amendments (NPAs), and provide information about Authorized Amendments (NAAs).

[Notice of proposed amendments \(NPA\) reference table](#)

1 September 2021 Regulation

Regulatory notifications

[MAA regulatory instructions \(RI\)](#)

26 February 2021 Regulation

[MAA regulatory notices \(RN\)](#)

11 August 2021 Regulation

[Withdrawn MAA regulatory instructions \(RI\)](#)

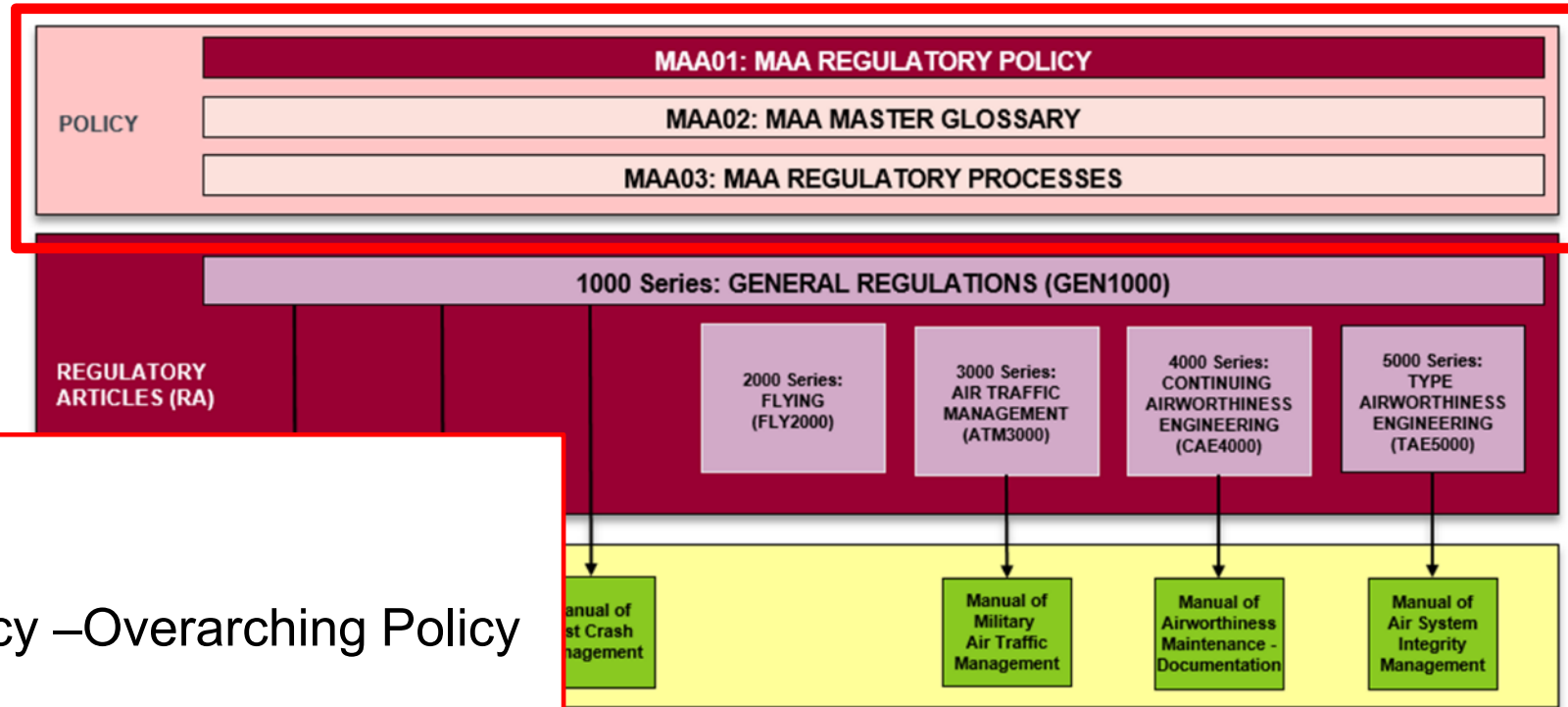
26 February 2021 Regulation

[Withdrawn MAA regulatory notices \(RN\)](#)

11 August 2021 Regulation

[MAA Regulatory Publications](#)

MRP Structure – Overarching Documents



Three MAA Policy documents:

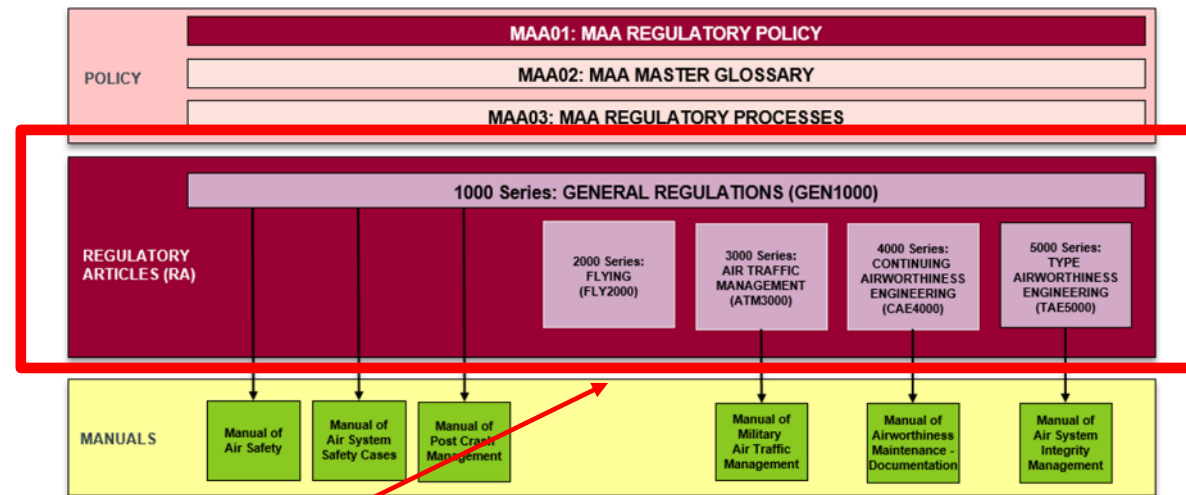
- MAA01: MAA Regulatory Policy –Overarching Policy
- MAA02: Master Glossary
- MAA03: Regulatory Processes

[MAA Regulatory Publications](#)

MRP Structure – Regulatory Articles

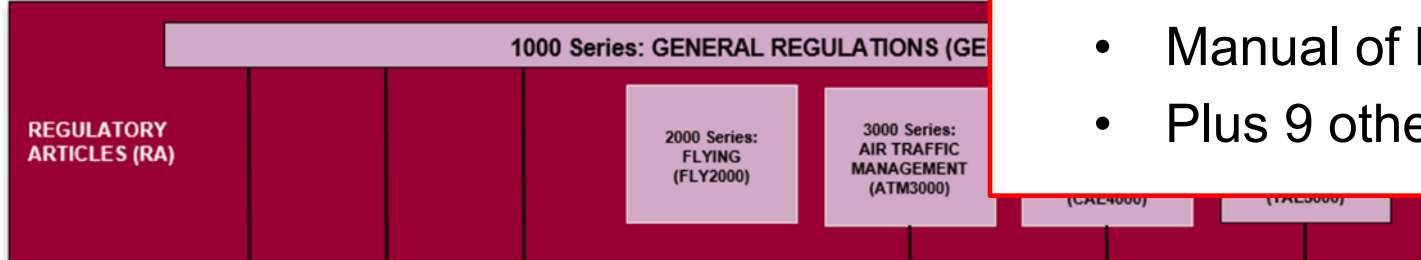
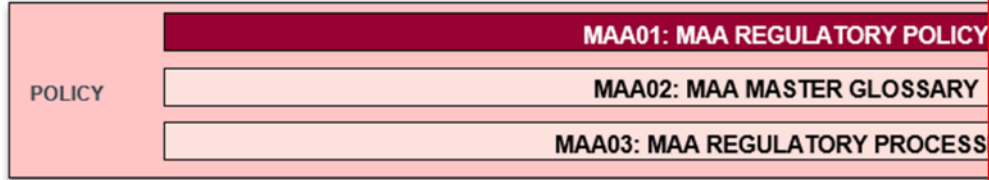
Regulatory Articles (RA) are broken down into five distinct series:

- 1000 Series: General Regulations (GEN)
- 2000 Series: Flying Regulations (FLY)
- 3000 Series: Air Traffic Management Regulations (ATM)
- 4000 Series: Continuing Airworthiness Engineering Regulations (CAE)
- 5000 Series: Type Airworthiness Engineering Regulations (TAE)



[MAA regulatory publications](#)
[Regulatory Article \(RA\) 5810: military type certificate \(MTC\) \(MRP Part 21 Subpart B\) - GOV.UK \(www.gov.uk\)](#)
[Regulatory Article \(RA\) 5820: changes in type design \(MRP Part 21 Subpart D\) - GOV.UK \(www.gov.uk\)](#)

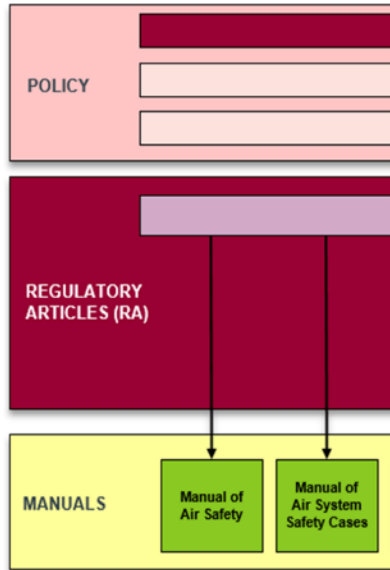
MRP Structure



- ### MAA Manuals:
- Manual of Military Air System Certification (MMAC)
 - Manual of Air System Safety Cases (MASSC)
 - Manual of Air System Integrity Management (MASIM)
 - Manual of Air Safety (MAS)
 - Manual of Military Airworthiness Recognition (MMAR)
 - Plus 9 others.

[MAA regulatory publications](#)

Regulatory Instruction (RI) and Regulatory Notice (RN)



RI

RN

- RIs and RNs used when timely notification is required
ie. quicker than would be achieved with an RA.
- MAA notification will depend upon the nature of the information:
 - **RI** - issued by the MAA to provide direction
- Same authority as MAA regulation.
 - **RN** - conveys regulatory information plus guidance on how to approach or interpret a regulation.
- When appropriate, RIs and RNs will be “uplifted” into the MRP as Regulatory Articles.

[MAA regulatory publications](#)

What is an MCRI? (Military Certification Review Item)

- MCRI provide a record (audit trail) of certification issues, assessments, actions and agreements between the TAA and MAA
e.g. Approval of and changes to the TCB; MAA acceptance of a non-compliance; clarification of certification artifacts and activities between the TAA and MAA.
- Two types of MCRI, **Administrative and Regulatory**



MCRI Type	MASC Process Subject Area/Content
Administrative	Acceptance of the Type Certification Basis (TCB) Proposed Primary Certification Specification
Regulatory	Clarification, discussion and agreement regarding certification issues between the MAA and TAA MCRI will state, chronologically, why an issue is under review, how it will be addressed and record TAA/MAA agreement. Detail any changes made to the TCB.

Types of MCRI

- **Administrative MCRI**

- **MCRI A-03** – Document approval of the TCB
- **MCRI A-09** Used if the proposed Primary Certification Specification is not the MAA's benchmark (Def Stan 00-970). Referenced by the MCRI A-03.

AET Tool 8R & 8S:
Administrative MCRI A-03
Guidance and Template

AET Tool 8C:
Administrative MCRI A-09
Guidance and Template

- **Regulatory Compliance MCRI**

- **TAA/MAA** Resolution of certification issues:
 - Specific to a single subject
 - Self-contained and self-explanatory
 - Chronological, enabling an **auditable trail**.

AET Tool 8U:
Regulatory Compliance
MCRI Guidance and
Template

A Word about Air Safety

Air Safety Is the state of freedom from unacceptable Risk of Injury to persons, or damage, throughout the life cycle of military Air Systems.....It does not address survivability in a hostile environment.

MAA 002 : MAA Master Glossary

Key driver for certification is about achieving an acceptable level of safety.

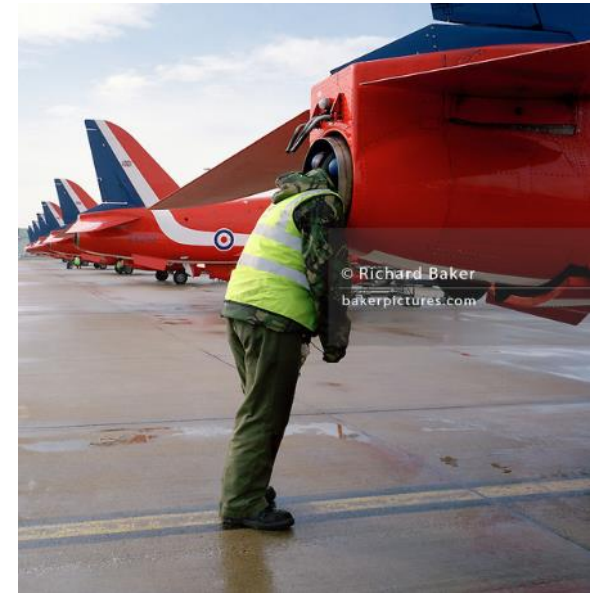
- Prevent accidents
- Legal duty – H&S At Work Act 1974
- Moral duty
- Maintain capability
- Financial implications
- Reputation
- Morale

Air Safety Management Training (ASMT) Course.
AET Process 16 for Safety Assessment Tools.

To ensure Risk to Life is ALARP and tolerable; **A**s **L**ow **A**s is **R**easonably **P**racticable

What is the relationship between Certification and the Health and Safety at Work Act 1974?

- Health, safety and wellbeing of employees.
- Number of fatalities at work have **reduced** by around **90% since 1974**.
- The MOD as an **organisation cannot be prosecuted** under the HSWA.
- **Individuals** within the MOD **can be prosecuted** if they are shown to have been negligent or have acted criminally.



If, whilst certifying an Air System or change to Air System, decisions are made that could be thought of as negligent, then you could be open to prosecution.

- Justifiable argument for any decision made
- Evidence retained to support justifiable argument
- Decisions only made within the terms of your Letter of Authority

MACP Introduction: Summary



- What is an Air System?
- What is Certification?
- Why and when is Certification needed?
- MACP framework
- MAA Regulatory Publications
- MCRIIs
- The importance of safety and implications
- Relationship between Certification and the Health and Safety at Work Act 1974



Break