

NPA/24/17

Title of Proposal: Bi-annual 5000 Series up-issue

RA(s) or Manual Chapter(s): RA5010, RA5726, RA5835, RA5850 & RA5865.

Organizations and / or business sectors affected: DTs & DOs.

RFC Serial No: MAA/RFC/2023/116, 2023/118, 2023/119, 2023/123, 2023/235, 2023/238, 2024/045, 2024/050, 2024/051, 2024/052, 2024/053, 2024/054, 2024/055

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N/A	N/A	N/A	N/A

Cross-references to Other Documents or Relevant Sources

Other MRP Amendments: N/A

Service Inquiry Recommendations: N/A

AAIB Recommendations: N/A

Other Investigation Recommendations: N/A

Any Other Document: N/A

Feedback Notes for the Regulated Community

The Regulated Community are invited to offer feedback about the proposed amendment in the following areas:

- Air or Flight Safety impact
- Operational impact
- Errors or omissions
- Timescale for implementation
- Cost of implementation
- Amendment to internal processes/orders
- Resourcing the outcome of change
- (Contract amendments because of the change)

The format for feedback is available within a single Excel Template file on both internal and external MAA websites; it is important to use this format to ensure that your responses are considered and answered correctly.

Summary of Proposed Amendment

Objective: To enhance clarity and to maintain coherency across the MRP.

Changes made: Enhanced clarity wrt TAw Strategy review, POA, HDO role and Repairs.

Impact Assessment: Some additional work by the DTs and DOs when first published to understand the changes and update any local procedures / documents.

Consultation Period Ends: 20 May 2024

The consultation period for this proposed amendment ends on the stated date. Please send your feedback, using the Response Form, via email to DSA-MAA-MRPEnquiries@mod.gov.uk

MAA Approval

Post	Name	Rank	Signature
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RA 5010 - Type Airworthiness Strategy

Rationale

A Type Airworthiness (TAW) Strategy is required for each Air System type to set down the intended approach to Type-related Air Safety and the demonstration and sustainment of TAW through life. Not having the TAW Strategy in place may result in key stakeholders not being sufficiently aware of the TAW management details for each Air System, resulting in the lack of evidence necessary to support TAW decision making. This RA sets out the requirements and processes necessary to support the TAW Strategy.

Contents

5010(1): Type Airworthiness Strategy

Regulation 5010(1)

Type Airworthiness Strategy

5010(1) The TAW Authority (TAA) or TAW Manager (TAM)¹ **shall** produce and maintain a through life TAW Strategy for an Air System² that supports the Air System Safety Case (ASSC)³.

Acceptable Means of Compliance 5010(1)

Type Airworthiness Strategy

1. Under arrangements for Civilian Operated Air Systems which invoke a TAA and TAM▶◀, the TAA **should** ▶prepare◀ a TAW Strategy. Under arrangements for Special Case Flying¹, the TAM **should** ▶prepare◀ a TAW Strategy.
2. The TAW Strategy **should** be:
 - a. ▶◀ Approved by the Defence Equipment and Support (DE&S) Operating Centre Director (OCD) or Sponsor at project initiation.
 - b. Updated as the project matures in line with ASSC³ requirements and to support initial Release To Service, Military Permit To Fly (MPTF) (In-Service) ▶or◀ MPTF (Special Case Flying) issue.
 - c. ▶ In-Service Air Systems **should** review their TAW Strategy on succession of the TAA or OCD and integration of significant TAW Strategy updates. The review **should** ensure continued validity and that ◀ the strategy continues to support the ASSC▶³◀ argument(s).
 - d. Updated by TAA or TAM and approved by the OCD or Sponsor.
 - e. Signed by TAA or TAM, and approved by the OCD or Sponsor, within 6 months of ▶the TAA or TAM receiving their Letter of Airworthiness Authority (LoAA) / Letter of Appointment (LoA)⁴.◀
3. The TAA or TAM **should** ensure that:
 - a. Key stakeholders⁵ are invited to comment on initial issue of the TAW Strategy and on significant update⁶, prior to approval.
 - b. Key stakeholders are informed of routine updates⁶ to the TAW Strategy when approved by OCD or Sponsor.
4. The TAA or TAM **should** ensure that the TAW Strategy includes:

¹ ▶Where the Air System is not UK MOD-owned, TAW management regulatory responsibility by either the TAA or TAM needs to be agreed within the Sponsor's approved model; refer to RA 1162 – Air Safety Governance Arrangements for Civilian Operated (Development) and (In-Service) Air Systems, or refer to RA 1163 – Air Safety Governance Arrangements for Special Case Flying Air Systems.◀

² Open Category and Specific S1 sub-category Remotely Piloted Air Systems (RPAS) do not require a TAW Strategy. Specific S2 sub-category and Certified Category RPAS require a TAW Strategy. Refer to RA 1600 Series – Remotely Piloted Air Systems.

³ Refer to RA 1205 – Air System Safety Cases.

⁴ ▶Refer to RA 1003 – Delegation of Airworthiness Authority and Notification of Air Safety Responsibility.◀

⁵ Key stakeholders include (but are not limited to) the Senior Responsible Owner (SRO), Aviation Duty Holders (ADH), Accountable Manager (Military Flying) (AM(MF)), the relevant Release To Service Authority (RTSA), DE&S Airworthiness Team and the MAA.

⁶ The definition of significant and routine update to TAW Strategy is at the discretion of the OCD or Sponsor, as described in the Guidance Material of this RA.

**Acceptable
Means of
Compliance
5010(1)**

- a. A clearly defined context, scope and boundary, including a declaration of the In-Service Date, Out of Service Date, and the intended military use of the Air System⁷ and ground-based systems key to the Air System's safe operation.
- b. The delegation of responsibilities between the TAA and TAM, if applicable.
- c. The approach to establishing and sustaining an effective Air Safety Management System (ASMS)⁸ with appropriate interfaces.
- d. Detail on the approach to establishing the Type Design⁹ and managing in-Service design changes^{10, 11}.
- e. The approach for ensuring the use of Airworthiness competent organizations and persons^{12, 13}.
- f. The approach to assurance and review of TAw management activities, including Quality Management Systems, Independent Technical Evaluation, Independent Safety Auditing and independent review of publications.
- g. Detail on the approach to delivering and sustaining the Air System TAw through proactive Integrity Management¹⁴, reactive Fault and Occurrence investigation¹⁵ and Hazard Management activity¹⁶.
- h. Identification and approach to integration of equipment and systems that are included within the Type Airworthiness Safety Assessment (TASA)^{16, 17} but are managed or supplied by other TAw organizations¹⁸.
- i. The approach to Configuration Management¹⁹ and Air System Document Set management^{20, 21}.
- j. The approach to Airworthiness Information Management²² and Data Exploitation²³.
- k. The approach to production acceptance, including an overview of oversight and how production concessions and waivers will be managed²⁴.
- l. The approach for assessing and ensuring sufficient human and capital resource to conduct the required tasks.

**Guidance
Material
5010(1)**

Type Airworthiness Strategy

5. The TAw Strategy facilitates the following management elements:
 - a. Identification and development of project-specific TAw and Safety-related standards, guidelines, procedures and training, including addressing all Airworthiness related standards that the TAA or TAM expects to employ to demonstrate compliance with the Type Certification Basis^{9, 10}. Where a Military Type Certificate is not awarded, the approach is likely to be based on Defence Standard (Def Stan) 00-970²⁵ unless otherwise agreed with the MAA.

⁷ Including sufficient Air Safety consideration of the integration of equipment to support Air System operation. Refer to RA 1340 – Equipment Not Basic to the Air System.

⁸ Refer to RA 1200 – Air Safety Management and RA 5011 – Type Airworthiness Safety Management System.

⁹ Refer to RA 5810 – Military Type Certificate (MRP Part 21 Subpart B).

¹⁰ Refer to RA 5820 – Changes in Type Design (MRP Part 21 Subpart D).

¹¹ Refer to RA 5305 – In-Service Design Changes.

¹² Refer to RA 1002 – Airworthiness Competent Persons.

¹³ Refer to RA 1005 – Contracting with Competent Organizations.

¹⁴ Refer to RA 5726 – Integrity Management.

¹⁵ Refer to RA 5825 – Fault Reporting and Investigation.

¹⁶ Refer to RA 5011 – Type Airworthiness Safety Management System.

¹⁷ Refer to RA 5012 – Type Airworthiness Safety Assessment.

¹⁸ Refer to RA 5013 – Air Safety Management of Equipment and Commodity Items.

¹⁹ Refer to RA 5301 – Air System Configuration Management.

²⁰ Refer to RA 1310 – Air System Document Set

²¹ Refer to RA 5815 – Instructions for Sustaining Type Airworthiness.

²² Refer to RA 1223 – Airworthiness Information Management

²³ Refer to RA 1207 – Air Safety Data Management and Exploitation

²⁴ Refer to RA 5835 – Production Organizations.

²⁵ Refer to Def Stan 00-970 – Certification Specifications for Airworthiness.

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5010(1)**

- b. Ensuring that resource provision is sufficient to produce and sustain an airworthy design by carrying out necessary engineering and Safety Management activities.
- c. Articulating the relationship (contractual or otherwise) with, and requirements placed upon, stakeholder organizations for the generation of the TASA. These may include the Front Line Command (FLC), Capability SRO, current or future ADH or AM(MF), the Design and Production Organizations, the appropriate Test and Evaluation (T&E) organization²⁶, the Military Continuing Airworthiness Manager (Mil CAM), Defence Aircrew Publications Squadron, and other relevant contractors and other defence equipment organizations (eg Commodity Delivery Teams¹⁸).
- d. Where the TAA or TAM proposes either using evidence supporting a civil Type Certificate or claiming credit for the certification activities of another military regulator, details will be provided in the TAw Strategy, along with a statement of intent to use MAA recognition if applicable.

Users of the TAw Strategy

- 6. The TAA or TAM will generate their TAw Strategy to guide their planning of the acquisition of and support to the Air Systems under their responsibility. The TAA or TAM will use the Strategy to lay out how they will satisfy their Airworthiness responsibilities.
- 7. The associated OCD or Sponsor will use the document to approve the TAA or TAM approach to delivering airworthy Air Systems. The OCD or Sponsor's approval of the TAw Strategy represents their endorsement that TAw aspects of the programme are viable.

The Airworthiness Strategy through the CADMID/T²⁷ Cycle

- 8. The TAw Strategy is particularly important in the early stages of the CADMID/T cycle. The first issue of the TAw Strategy will be available before Outline Business Case (OBC). Thereafter it will evolve throughout the life of the project, remaining relevant through to disposal.
- 9. At OBC, the TAw Strategy is expected to indicate basic details of the policies and approach that the TAA or TAM intends to adopt throughout the life of the Air System. By Full Business Case (FBC), the TAw Strategy is expected to be further refined to accurately provide the context, policies and processes adopted by the TAA or TAM.
- 10. The TAA or TAM requirement to review the TAw Strategy in line with ASSC review will need to be an auditable review, but may conclude that an update to the TAw strategy is not required at time of review.
- 11. The definition of a significant update to TAw Strategy (which therefore requires stakeholder comment before approval) is at the discretion of the OCD or Sponsor, but is likely to include any of the following circumstances:
 - a. Changes in scope or approach to the delivery of TAw (perhaps because the assumptions that were made in the original TAw Strategy proved to be incorrect).
 - b. Changes in commercial arrangements that have the potential to impact Air Safety.
 - c. Significant changes in the Air System operating environment and / or usage.
 - d. Planning the delivery of Airworthiness in a new stage of the CADMID/T cycle.
 - e. Significant changes in legislation, regulation or policy.

²⁶ Refer to RA 2370 – Test and Evaluation.

²⁷ The Concept, Assessment, Demonstration, Manufacture, In-Service and Disposal (CADMID) Cycle. In some cases, Termination of service is more appropriate than Disposal.

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RA 5726 – Integrity Management

Rationale

The technical and organizational uncertainties associated with military aviation contribute to a complex range of Hazards that may compromise Air System Integrity. A comprehensive, through-life, Integrity Management (IM) approach enables these potential Airworthiness threats to be managed. Whilst support from various stakeholders is needed for effective IM, the overall responsibility is assigned to the Type Airworthiness Authority's (TAA)¹. This RA details these TAA IM responsibilities and will be read in conjunction with the Manual of Air System Integrity Management (MASIM)².

Contents

Definitions Relevant to this RA

5726(1): Integrity Management

5726(2): Establishing Integrity Management

5726(3): Sustaining Integrity Management

5726(4): Validating Integrity

5726(5): Recovering Integrity

5726(6): Exploiting Integrity

Definitions

Definitions Relevant to this RA

1. **Integrity.** The ability of an Air System to retain its design intended properties and function throughout its service life when maintained and operated in accordance with (iaw) the Air System Document Set (ADS).
2. **Integrity Baseline.** The artefacts that define the Design Organization's (DO) contribution to the ADS for an Integrity discipline. In a Claim-Argument-Evidence approach, the Integrity Baseline (the 'Claim') is underpinned by Integrity Assertions (the 'Argument') of the Integrity Evidence (the 'Evidence'). Integrity Baselines are established prior to entry of the Air System to service and are updated through-life.
3. **Integrity Assertions.** Declarations made in the Integrity Baseline that a feature of the design has Integrity. The Integrity Assertions within the Integrity Baseline (the 'Claim') are the outcome of an assessment (the 'Argument') of the Integrity Evidence (the 'Evidence').
4. **Integrity Evidence.** The design and Certification products that underpin the Integrity assertions stated explicitly / implicitly in the Integrity baseline. In the first instance Integrity evidence is produced to support the Air System entering service and may be based upon design assumptions and / or service operating intent. When in-service, the Integrity evidence is continuously updated according to analysis of Service Data. It is captured in an Integrity Evidence record.
5. **Service Data.** The information relating to the usage, condition, failures or loads experienced by an Air System that, when collected and analyzed, needs to be tested against the Integrity Evidence to support the Integrity Baseline.
6. **IM Systems.** The IM programmes, tools and processes, established by the TAA, that are necessary to assure the Integrity of the Air System. These Systems capture and assess Service Data to better understand the usage of the Air System, the failures of systems, and / or the loads that it experiences. Programmes are established to better understand the condition of the Air System.
7. **Independent Airworthiness Advisor (IAA).** An IAA is a competent individual, independent of the DO, who provides independent Air System technical advice to the

¹ Where the Air System is not UK MOD-owned, Type Airworthiness (TAw) management regulatory responsibility by either the TAA or Type Airworthiness Manager (TAM) needs to be agreed within the Sponsor's approved model; refer to RA 1162 – Air Safety Governance Arrangements for Civilian Operated (Development) and (In-Service) Air Systems, or refer to RA 1163 – Air Safety Governance Arrangements for Special Case Flying Air Systems. Dependant on the agreed delegation of TAw responsibilities TAM may be read in place of TAA as appropriate throughout this RA.

² Refer to the Manual of Air System Integrity Management (MASIM).

Definitions

TAA³. To be considered a Suitably Qualified and Experienced Person (SQEP), they will be a Chartered Engineer, ►and◄ have a ►◄ minimum of 5 years' experience in Air System design, Safety Assessment, IM or Maintenance; relevant to both the Air System type and the specialization for which advice will be given.

**Regulation
5726(1)****Integrity Management**

5726(1) The TAA **shall** be responsible for IM, for all Air System types within their Area of Responsibility, to maintain Integrity.

**Acceptable
Means of
Compliance
5726(1)****Integrity Management**

8. As a key enabler of the Air System Safety Case⁴, the TAA **should** ensure an IM programme is in place prior to the Air System In-Service Date (ISD) and is maintained throughout the life of the Air System.

9. The Establish-Sustain-Validate-Recover-Exploit (ESVRE) management framework **should** be used to confirm the Integrity Assertions to provide confidence in the Integrity Baseline and counter threats to Integrity identified by evolving Integrity Evidence.

10. The TAA **should** consider the most effective and efficient strategy for managing IM activities. As a minimum, consideration **should** be given to the need for separate activities for the three most commonly used Integrity disciplines (Structural, Systems and Propulsion), including Integrity Working Groups (IWG). The overall approach **should** be recorded in the Air System Integrity Strategy Document (AISD).

11. Where threats to Integrity are identified, they **should** be managed, and continually reviewed in response to In-Service developments and Service Data.

12. All those with responsibilities which impact on, or which contribute to Integrity **should** identify to the TAA at the earliest opportunity any decision, activity or change in circumstances that has the potential to pose a threat to Integrity.

13. Delivery Team (DT) personnel with specific Integrity responsibilities **should** be identified by the TAA and attend the appropriate Integrity course⁵.

14. IM for Remotely Piloted Air Systems **should** be in accordance with RA 1600(2)⁶.

**Guidance
Material
5726(1)****Integrity Management**

15. For guidance on all aspects of IM, refer to the MASIM².

**Regulation
5726(2)****Establishing Integrity Management**

5726(2) The TAA **shall** establish IM to demonstrate that the Air System is airworthy to operate through all conditions detailed in the Release To Service (RTS), Military Permit To Fly (MPTF) (In-Service) or MPTF (Special Case Flying) and reflect the usage set out in the Statement of Operating Intent (SOI).

³ The IAA is not to be confused with the Independent Technical Evaluator or Independent Safety Auditor.

⁴ Refer to RA 1205 – Air System Safety Cases.

⁵ For further training details see RA 1440 – Air Safety Training.

⁶ Refer to RA 1600(2): Remotely Piloted Air System Regulatory Requirements.

**Acceptable
Means of
Compliance
5726(2)**

Establishing Integrity Management

Integrity Governance

16. The TAA **should** establish an IM Strategy that is:
 - a. Communicated to stakeholders through the AISD prior to Full Business Case approval of the project.
 - b. Managed through an IM Plan (IMP) initiated prior to ISD.
 - c. Implemented through a 6-monthly IWG initiated prior to the ISD.
 - d. Implemented with defined boundaries and interfaces between various IM disciplines.
 - e. Implemented with defined mechanisms for reporting on the status of Integrity of the Air System within Defence Equipment & Support (DE&S) and to the Aviation Duty Holder (ADH) / Accountable Manager (Military Flying) (AM(MF)).
17. The AISD **should** be owned by the TAA and endorsed on first release and following any significant amendment.
18. The IWG **should** be chaired by the TAA or a holder of a delegated Letter of Airworthiness Authority (LoAA) that refers specifically to the role of IWG Chair, who is at least OF4 (or equivalent).
19. The IWG Chair **should** ensure that the IWG comprises a quorum of SQEP stakeholders (identified below), and additional stakeholders as necessary.
 - a. DO / Coordinating DO.
 - b. DT⁷ member(s) responsible for IM.
 - c. Service provider / Support contractor (if applicable).
 - d. Continuing Airworthiness Management Organization (CAMO) member responsible for IM.
 - e. Civil Aviation Authority for military registered Aircraft subject to civil oversight⁸.
 - f. DT Safety Manager.
 - g. **▶ IAA(s) with the requisite SQEP (ie Structures, Propulsion, Systems, software etc)⁹. ◀**
 - (1) **▶ ◀**
 - (2) **▶ ◀**
 - h. Release To Service Authority (RTSA) or Sponsor representative.
 - i. MAA **should** be invited but will attend on a Risk-based basis although the MAA **should not** form part of the quorate SQEP stakeholders list.

Integrity Evidence and Baseline

20. The TAA **should** identify the Integrity Baseline, including the underpinning Integrity Evidence and Integrity Assertions.
21. The SOI (AP101X-XXXX-15S or equivalent) **should** be owned and authorized by the ADH or AM(MF) and **should** include requirements for all relevant disciplines, to be published in the ADS no later than the issue of the Type Certification Basis¹⁰. The TAA and ADH or AM(MF) **should** ensure that an SOI for all new Air System types and significant Marks, is developed in consultation with, and formally conveyed to, the Air

⁷ **▶ Where the term DT or Commodity DT is used in this RA, this may include the TAM and organizations supporting the TAM where appropriate. ◀**

⁸ Refer to RA 1165 – UK Civil Aviation Authority Oversight of UK Military Registered Air Systems.

⁹ **▶ An experienced ISAA is regarded as SQEP in pan-discipline IM matters from a regulatory compliance perspective, but an IAA in the required field **should** address specific issues in disciplines other than Structures. ◀**

¹⁰ Refer to RA 5810 – Military Type Certificate (MRP Part 21 Subpart B).

**Acceptable
Means of
Compliance
5726(2)**

System DO. In turn, the Air System DO **should** communicate this information to the Type Certified Product DOs (ie Propulsion System DO).

22. Where an Air System is operated, or intended to be operated, by multiple Operating Duty Holders (ODH) / AM(MF), the SOI **should** be owned and authorized by the lead end-user ADH or AM(MF) and **should** encompass the full scope of activities to be conducted by all ODH / AM(MF).

23. The TAA **should** ensure that all critical or significant items², eg Structural Significant Items or Functionally Significant Items, have appropriate associated Maintenance activities derived by suitable methodology, in consultation with the DO, as part of the Integrity Baseline.

24. The TAA **should** authorize the component lives (Critical and Non-Critical) and, where applicable exchange rates identified by the DO, and promulgate these in AP101X-XXXX-5A1 or equivalent Maintenance schedule.

25. The TAA **should** ensure that Commodity DT Chief Engineers (DT CE) establish the lifing details and Continuing Airworthiness requirements of components for which they are responsible and present their Integrity Evidence and Integrity Assertions to the TAA for final authorization.

IM Systems

26. The TAA, in consultation with the DO, **should** identify any IM Systems requirements necessary to assure the Integrity of the Air System.

27. The TAA **should** establish:

- a. Health monitoring and usage monitoring systems and ensure that thresholds for acceptable capture rate of usage data are defined, to enable inspection and replacement of components to be scheduled with adequate confidence.
- b. A system to capture usage against sortie profiles throughout the life of the Air System and a means to quantify unmonitored sorties.
- c. An approach to validate the usage data through engagement with the DO during the design and introduction to service of the Air System.
- d. In consultation with the DO, an exceedance monitoring system in order to capture events that may be a threat to the Integrity of the Air System.
- e. An Air System Fault Reporting, Analysis and Corrective Action System.
- f. A Configuration Status Record (CSR)¹¹ for the Air System. The CSR **should** detail the Configuration of each Air System Type Design and its components in sufficient detail to maintain Configuration Control (CC) and to support Integrity decisions.

28. The TAA **should** ensure that IM programmes, or the capability to conduct them, are in place in order to understand the condition of the Air System In-Service. The nature of these programmes of activity are likely to be particular to an Integrity discipline.

29. The TAA **should** agree with the CAMO and DO stakeholder, access to, and the means of providing, Service Data from the Forward and Depth domains.

30. The TAA **should** define limits for investigation / urgent action on any data loss from monitoring systems and implement a process to monitor and react. Limits may differ depending on the complexity, reliability and criticality of the monitoring system.

31. The TAA **should** ensure that an Environmental Damage (ED) Prevention and Control (EDPC) programme, including measures to manage the Risk to Airworthiness arising from ED, is established in cooperation with the DO.

32. The TAA **should** ensure IM is supported by an Examination Programme (EP), established prior to the ISD, which **should** include:

¹¹ Refer to RA 5301 – Air System Configuration Management.

**Acceptable
Means of
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5726(2)**

- a. Classification of significant items as either At Risk (AR) or Not at Risk (NAR) from Accidental Damage (AD) or ED.
 - b. Scheduled examinations based on this classification, and examination and retirement of components according to their fatigue clearances or component lives.
 - c. A Sampling Programme (SP), for components not normally inspected during scheduled examinations, which includes any requirements for teardown¹² to inform the Maintenance schedule.
 - d. An inspection of all critical or significant items, iaw the Preventive Maintenance and EP / SP programmes, before the fleet leader reaches 80% of its original design life (or revised life, if less).
33. The TAA or Commodity DT Leader (DTL) **should** ensure appropriate arrangements are in place for the SP with the DO. The DO **should**:
- a. Notify the TAA or Commodity DT CE of the date, time and location scheduled for the tests and / or strip examination of SP materiel subject to fault action.
 - b. Submit a report to the TAA or Commodity DTL, covering the following points:
 - (1) The deterioration in performance and / or the degree of wear which has occurred.
 - (2) The recommended future service life for this type of item and whether further sampling is required.
 - (3) Those features of design which limit life extension and whether Modification action is feasible and economic.
34. The TAA **should** ensure, where appropriate, that experience and data from other operators of the same Air System type, or Air Systems in similar roles, is used to inform the IM of their Air System.

**Guidance
Material
5726(2)**

Establishing Integrity Management

35. For guidance refer to the MASIM².

**Regulation
5726(3)**

Sustaining Integrity Management

- 5726(3) The TAA **shall** ensure that IM is sustained, and In-Service Data used, to continuously monitor and counter threats to Integrity.

**Acceptable
Means of
Compliance
5726(3)**

Sustaining Integrity Management

Integrity Governance

36. The TAA **should** review and monitor outputs from the IM Systems and report key issues to the IWG.
37. The AISD and the IMP **should** be reviewed by all stakeholders prior to every IWG and both **should** be ratified by the quorate members of the IWG.
38. The TAA **should** identify any unmitigated or unquantified Airworthiness Risks, associated with IM which have been accepted by the relevant IWG, and raise them to the Platform Safety and Environment Panel and / or the Air System Safety Working Group.

Integrity Evidence and Baseline

39. All changes to component lives, Maintenance thresholds or intervals **should** be:

¹² Refer to Military Aircraft Structures Airworthiness Advisory Group (MASAAG) Paper 105 Guidance and Best Practice for Teardown Inspections.

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5726(3)**

- a. Supported by a Risk Assessment.
 - b. Conveyed to the IWG and reviewed periodically.
 - c. Considered within the Type Airworthiness Safety Assessment.
 - d. Authorized by personnel with the appropriate delegated authority supported by independent assessment as required.
40. Stakeholders **should** report any significant changes in usage or operation to the IWG.

IM Systems

41. The TAA **should**:
- a. Ensure that IM systems created in the Establishing phase are implemented correctly and periodically reviewed, with significant findings, including data loss, unmonitored sorties and CC issues, reported to the IWG.
 - b. Maintain IM systems in an effective condition in order to maximize the capture, use and monitoring of Service Data by the CAMO, the DT and the IWG, respectively.
 - c. Ensure that lost usage data is restored if possible; if not, a technical assessment of the loss **should** be carried out. The TAA / TAM **should** ensure that procedures, or appropriate fill-in rates for lost usage data, are in place and applied as required.
 - d. Ensure that the Air System technical log¹³ reflects the 'as flown' Configuration is maintained for the life of the Air System and is populated with all relevant arisings that have the potential to impact Integrity.
 - e. Ensure that any IM Programmes created in the Establishing phase are implemented correctly and periodically reviewed, and a summary of the results reported to each IWG.

**Guidance
Material
5726(3)**

Sustaining Integrity Management

42. For guidance refer to the MASIM².

**Regulation
5726(4)**

Validating Integrity

- 5726(4) The TAA **shall** ensure that Integrity Evidence, Assertions and Baseline are periodically validated.

**Acceptable
Means of
Compliance
5726(4)**

Validating Integrity

Integrity Governance

43. The TAA **should** use the IWG to validate the Integrity Baseline against the most up to date Service Data and analysis available.
44. The TAA **should** ensure that the validity of the Integrity Baseline is confirmed at the completion of the IWG.

Integrity Evidence, Assertions and Baseline

45. The Integrity Evidence and Baseline **should** be reviewed and updated, with the support of the DO, in response to findings occasioned by validating activities.
46. The TAA **should** ensure that cleared life is reviewed in response to changes to fleet planning assumptions.
47. The TAA **should** ensure that component lifing, recording processes and metrics, are periodically reviewed.

¹³ Air System technical log includes MF700 (or Air System equivalent) / Airworthiness Information Management.

**Acceptable
Means of
Compliance
5726(4)**

48. The TAA **should** ensure that the Maintenance schedule¹⁴ is reviewed at least every 5 years.

IM Systems

49. The TAA, with the assistance of the Military Continuing Airworthiness Manager and DO, **should** review and validate Maintenance processes.

50. The TAA **should** support the ADH or AM(MF) to ensure that the first usage data validation (conversion of the SOI into an SOI and Usage (SOIU)), which forms the baseline for comparison against future validation data, is undertaken once usage is considered to be stable or no later than 3 years after ISD. The ADH or AM(MF) **should** authorize the amendment to each issue of SOIU.

51. The TAA **should** support the ADH or AM(MF) review of the SOI / SOIU and make the results available to the IWG. These reviews **should** be undertaken by the ADH or AM(MF) as follows:

- a. A basic annual review by the appropriate ADH or AM(MF), to confirm that the SOI or SOIU (as appropriate) remains an accurate record.
- b. A detailed qualitative and quantitative triennial review is conducted using Aircrew interviews, data obtained via the Aircraft log, on-board Systems and / or instrumented flights to confirm future intent and validate usage against the Design Usage Spectrum assumptions.
- c. Establishing the 'so what' to anticipated changes.
- d. The review confirms that the expected and validated usage is within the RTS, MPTF (In-Service) or MPTF (Special Case Flying) limits.

52. Following SOIU reviews:

- a. The TAA **should** task DO support to determine the effect of any SOI / SOIU changes on the Integrity Baseline and their recommended operating limitations and Maintenance instructions.
- b. The TAA **should** retain an audit trail of all changes made to any of their TAw limitations, instructions or arrangements as a result of the SOI / SOIU review in current Regulations¹⁵.
- c. The ADH or AM(MF) **should** make aircrew familiar with the changes that have been made to Sortie Profile Codes (SPC) within the SOIU and the need for both accurate recording and efficacy of reporting of any changes in usage.

53. The ADH or AM(MF) **should** ensure that the SOI / SOIU (AP101X-XXXX-15S or equivalent) is updated in the ADS.

54. The TAA **should** ensure that results from the EP (including scheduled examinations, and where necessary, the SP and teardown¹² and forensic examination) are collated, reviewed and subjected to trend analysis to inform Maintenance Schedule Reviews, update the IWG on the efficacy of the EP and permit the DO to update lifing predictions.

55. The TAA **should** verify the ability of a system or component to: retain its function within defined limits, function without undue frequency of failure and function without adverse effect on other Systems or components.

56. The TAA **should** ensure that where a Safety-critical system relies upon measurement of a parameter (such as temperature or pressure) this system **should** have an appropriate calibration policy and procedure defined in the ADS.

57. A programme for usage validation **should** be conducted through engagement with the DO, by means of a Structural Health Monitoring System (SHMS), Health and Usage Monitoring System (HUMS), Operational Loads Measurement (OLM) / Operational Data Recording (ODR) or other usage monitoring Systems, on a representative sample of In-Service Air Systems.

¹⁴ Refer to RA 5320 – Air System Maintenance Schedule – Design and Validation.

¹⁵ Refer to RA 1225 – Air Safety Documentation Audit Trail.

**Acceptable
Means of
Compliance
5726(4)**

58. The TAA **should** ensure the timing of usage validation programmes is being determined by its aims. The requirement to carry out the validation **should** be reviewed at least every 6 years by the TAA (concurrently with a triennial SOIU review) with the decision and rationale supported by evidence and documented in the AISD.

59. The usage validation programme **should** be considered following any Major Change in usage or rate of life consumption or in conjunction with any plans for a Major Type Design change, significant change in usage or life extension, ie where re-validation of significant parameters is necessary, decisions on usage data validation requirements **should** be documented in the AISD.

60. The TAA **should** initiate an Ageing Air System Audit¹⁶.

**Guidance
Material
5726(4)**

Validating Integrity

61. For guidance refer to the MASIM².

**Regulation
5726(5)**

Recovering Integrity

5726(5) The TAA **shall** ensure that any loss or potential compromise of Integrity is recovered.

**Acceptable
Means of
Compliance
5726(5)**

Recovering Integrity

Integrity Governance

62. The TAA **should** treat a loss or potential compromise of Integrity as an Airworthiness Issue and act to recover Integrity.

63. Any recommendations at an IWG to amend inspection intervals **should** be ratified by the LoAA holder prior to incorporation in the Maintenance schedule.

Integrity Evidence, Assertions and Baseline

64. The TAA **should** ensure the established IM Systems are implemented where the Integrity Evidence and Assertions no longer supports the Integrity Baseline.

65. The TAA **should** ensure that the need for measures to conserve life is considered where life may be insufficient to reach the planned Out of Service Date.

66. The TAA **should** consider the need for Modification, refurbishment or component replacement to mitigate fatigue damage in order to meet fleet planning objectives.

67. The TAA **should** ensure that repairs are:

- a. Developed by an approved DO.
- b. Assessed against the appropriate design standard, with lifing and inspection requirements clearly established, and consideration given to the effect of adjacent and / or previous repairs.
- c. Recorded in the Air System technical log.

68. Remedial action **should** be taken, and the IWG notified, if significant deviation in individual Air System weight and balance is identified by the CAMO.

**Guidance
Material
5726(5)**

Recovering Integrity

69. For guidance refer to the MASIM².

**Regulation
5726(6)**

Exploiting Integrity

5726(6) The TAA **shall** ensure that Integrity is exploited to make best use of the inherent capabilities of the Air System.

¹⁶ Refer to RA 5723 - Ageing Air System Audit.

**Acceptable
Means of
Compliance
5726(6)****Exploiting Integrity**

70. The TAA **should** ensure activities are put in place to record, report and, if required, act where the Service Data and analysis suggests there may be an opportunity to relax requirements within the Integrity Baseline without introducing new threats to Integrity.

71. Any recommendations at an IWG to relax requirements within the Integrity Baseline **should** be ratified by the LoAA holder prior to incorporation in the Maintenance schedule.

**Guidance
Material
5726(6)****Exploiting Integrity**

72. For guidance refer to the MASIM².

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RA 5835 – Production Organizations (MRP Part 21 Subpart G)

Rationale

Although the MAA does not currently require the specific approval of Production Organizations (PO)¹, it is essential that the engineering process link between design and production is established. Without adequate Assurance that the engineering processes between design and PO are linked, there is potential for PO to manufacture Products, Parts, Appliances, Airborne Equipment and Air Launched Weapons that do not meet the designs produced by the Design Organization(s) (DO). This RA ensures that a level of Assurance is identified and that Air Systems (and related Products, Parts and Appliances) are produced by competent organizations and show conformity to the applicable design data and are in a condition for safe operation.

Contents

5835(1): Production Organizations

Regulation 5835(1)

Production Organizations

5835(1) The Type Airworthiness Authority (TAA)² or Commodity Chief Engineer (CE) **shall** ensure that 'prime'³ PO hold a ► ◀ Part 21 Subpart G approval ► that is accepted by the MAA or have a nationally accredited Quality Management System (QMS) with an appropriate scope for Production. ◀

Acceptable Means of Compliance 5835(1)

Production Organizations

Common Acceptable Means of Compliance (AMC)

1. ► Part 21 Subpart G approvals from one of the following organizations are categorized as accepted by the MAA. If a 'prime' DO holds any of these approvals, they **should** submit their Production Organization Exposition (POE) to the TAA or Commodity CE to confirm that its scope is appropriate for the production tasks:
 - a. European Union Aviation Safety Agency (EASA).
 - b. Federal Aviation Administration (FAA)⁴.
 - c. Civil Aviation Authority (CAA).
 - d. A National Military Airworthiness Authority that the MAA has a Recognition in place with and that Recognition specifically enables the use of their Part 21 Production Organization Approvals (as detailed on the MAA Recognition webpage⁵). ◀
2. If the 'prime' PO does not hold a recognized Part 21 Subpart G approval ► accepted by the MAA ◀, or the approval held does not cover the scope of the production tasks, the TAA or Commodity CE **should** assure themselves that the 'prime' PO:
 - a. Hold AS/EN 9100 certification and comply with Allied Quality Assurance Publication (AQAP) 2310 covering the scope of production tasks. The certification **should** be issued by a Certification Body holding suitable accreditation, with the right scope, from a National Accreditation Body (NAB)⁹ who is a signatory to the International Accreditation Forum (IAF) or IAF

¹ Refer to RA 1005 – Contracting with Competent Organizations.

² Where the Air System is not UK owned, Type Airworthiness (TAW) management regulatory responsibility by either the TAA or Type Airworthiness Manager (TAM) needs to be agreed within the Sponsor's approved model; refer to RA 1162 – Air Safety Governance Arrangements for Civilian Operated (Development) and (In-Service) Air Systems or refer to RA 1163 – Air Safety Governance Arrangements for Special Case Flying Air Systems. Dependant on the agreed delegation of TAW responsibilities TAM may be read in place of TAA as appropriate throughout this RA.

³ 'Prime' refers to the highest level of Air System, Product, Part or Appliance procured by the DO or Delivery Team within an arrangement / contract.

⁴ FAA Production Approval Regulations are a subset of the Title 14 Code of Federal Regulations (CFR) known as 14 CFR Part 21 Subpart G

⁵ ► MAA Recognition – www.gov.uk/government/publications/maa-recognition. ◀

**Acceptable
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Compliance
5835(1)**

Accredited Regional Multi-Lateral Agreements (MLA). The Quality system **should** contain:

- (1) Control procedures for traceability including a definition of clear criteria of which Parts or Appliances need such traceability eg Critical Parts.
 - b. Submit their POE to the TAA or Commodity CE, as appropriate, to enable assessment of competency¹.
3. The TAA or Commodity CE **should** assure themselves that the 'prime' PO can demonstrate that it has established and is able to maintain a QMS to ensure that each Product, Part and Appliance produced by the organization or by its partners, or supplied from or subcontracted to outside parties, conforms to the applicable design data and is in condition for safe operation.
 4. The TAA or Commodity CE **should** assure themselves that the 'prime' PO has a documented arrangement in place with the appropriate DO describing in detail how to reliably use the applicable design data to manufacture a Product, Part or Appliance.
 5. This arrangement **should** detail as a minimum:
 - a. The responsibilities of the PO and DO with respect to the arrangement.
 - b. The procedures to deal adequately with production deviations and non-conforming Parts⁶.
 - c. The procedures and associated responsibilities to achieve adequate configuration control of manufactured Parts (ie traceability).
 - d. The procedure for requesting and managing changes in manufacturing methods or materials.
 6. The TAA or Commodity CE **should** assure themselves that the 'prime' PO has the facilities and processes to:
 - a. Keep full records of all work carried out⁷.
 - b. Maintain an auditable trail of approved concessions and deviations.
 - c. Ensure that their Products, Parts and Appliances conform to the approved type design.
 7. Where a 'prime' PO uses Parts or Appliances from a sub-contractor, the TAA or Commodity CE **should** assure themselves that the 'prime' PO has an auditable process to demonstrate design conformity, Safety for operation and that full records of work carried out are retained.
 8. If the TAA or Commodity CE is procuring through a Foreign Military Sales (FMS) contract, they **should** assure themselves of the design conformity and Assurance for operation of the Product, Part or Appliance.

Additional AMC – TAA only

9. In addition to the requirements of paragraph 2, the TAA **should** ensure that the 'prime' PO is subject to Defence Quality Assurance – Field Force (DQA-FF) surveillance.
10. The collaboration between the 'prime' PO and DO **should** be agreed by the TAA, irrespective of whether the DO is acting as a Co-ordinating Design Organization (CDO) or Air System CDO⁸.

Additional AMC – Commodity CE only

11. In derogation to paragraph 4, where Products, Parts and Appliances are procured to prescribed technical specifications without reach back to the DO (eg standard Parts, Commercial Off the Shelf parts etc) the Commodity CE **should** assure themselves of the design conformity and Assurance for operation of the Product, Part or Appliance.

⁶ Refer to RA 5825 – Fault Reporting and Investigation.

⁷ Refer to RA 1225 – Air Safety Documentation Audit Trail.

⁸ Refer to RA 1014 – Design Organizations and Co-ordinating Design Organizations – Airworthiness Responsibilities.

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5835(1)**

12. The Commodity CE **should** assure themselves of the governance and Assurance management systems in place for / within POs to ensure the design conformity and Assurance for operation of the procured Product, Part of Appliance. Additionally, the Commodity CE **should** have right of access / investigation of production arrangements to ensure Quality and traceability of Products, Parts and Appliance is maintained.

**Guidance
Material
5835(1)**

Production Organizations

Common Guidance Material (GM)

13. The POE may follow the format as defined in EASA Part 21 Subpart G detailing as a minimum:

- a. A statement confirming that the POE and any associated manuals which define production processes will be complied with.
- b. The organizational structure showing associated chains of responsibility.
- c. A list of certifying staff.
- d. A general description of the facilities located at each address.
- e. A description of the PO's scope of work.
- f. The procedure for the notification of organizational changes to the TAA or Commodity CE.
- g. The amendment procedure for the POE.
- h. A description of the QMS and the procedures necessary to demonstrate that the Products, Parts and Appliances conform to the relevant design and are in a condition for the safe operation.

14. The documented arrangement between the PO and DO may follow the sample format defined in EASA Part 21 Subpart G.

15. The 'prime' PO is responsible for determining and applying acceptance standards for physical condition, configuration status and conformity of supplied Products, Parts and Appliances, whether to be used in production or delivered to customers as spare Parts.

16. The control of POs holding an EASA Part 21 Subpart G approval for the Parts or Appliances to be supplied can be reduced to a level at which a satisfactory interface between the two QMS can be demonstrated. Thus, the 'prime' PO can rely upon documentation for Parts or Appliances released under a supplier's EASA 21.A.163 privileges.

17. A PO ► (that is not the Prime PO) ◀ who does not hold a ► ◀ Part 21 Subpart G ► approval that is accepted by the MAA (see paragraph 1) ◀ is considered as a sub-contractor under the direct control of the 'prime' PO's Management System.

18. If several TAAs are relying on the same division of an organization as a PO, they might decide to co-ordinate work to achieve compliance with RA 5835(1).

19. Quality Assurance of FMS procurement may follow the processes detailed in the Knowledge in Defence⁹.

20. A change in place or method of manufacture or a change of explosive material or source of explosive material will require Independent Ordnance, Munitions and Explosives Safety Advisor advice¹⁰.

Additional GM – TAA / TAM only

21. Where the TAM is delegated to deliver Type Airworthiness responsibility¹¹, the tasking of DQA-FF will be through the TAA.

⁹ <https://www.gov.uk/guidance/knowledge-in-defence-kid>.

¹⁰ Refer to Regulation DSA 02.OME(2) – Appointment of an independent OME safety advisor.

¹¹ Refer to RA 1162 – Air Safety Governance Arrangements for Civilian Operated (Development) and (In-Service) Air Systems.

**Guidance
Material
5835(1)**

Additional GM – Commodity CE only

22. Nil.

RA 5850 – Military Design Approved Organization (MRP Part 21 Subpart J)

Rationale

The Design Approved Organization Scheme (DAOS) is a mechanism by which the competence of a Design Organization (DO) can be assessed. The use of a non DAOS organization for design services may introduce design errors to the Design. Approval under DAOS is subject to adherence with the established procedures and rules governing the responsibilities and privileges for Military Design Approved Organizations.

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- 5850(1): Responsibilities of a Design Organization**
- 5850(2): Scheme Inclusion and Approval Award**
- 5850(3): Design Management System (MRP Part 21.A.239)**
- 5850(4): Design Organization Exposition**
- 5850(5): Approval Requirements (MRP Part 21.A.245)**
- 5850(6): Changes in Design Management System (MRP Part 21.A.247)**
- 5850(7): Investigations and Inspections (MRP Part 21.A.257)**
- 5850(8): Failures, Malfunctions and Defects**
- 5850(9): Findings (MRP Part 21.A.258)**
- 5850(10): Validity of Approval (MRP Part 21.A.259)**
- 5850(11): Privileges (MRP Part 21.A.263)**
- 5850(12): Designs using Government Furnished Equipment**
- 5850(13): Record Keeping**

Regulation 5850(1)

Responsibilities of a Design Organization

5850(1) A DO or Co-ordinating DO (CDO) **shall** fulfil the defined design and development responsibilities under their Terms of Approval.

Acceptable Means of Compliance 5850(1)

Responsibilities of a Design Organization

1. For Civilian-Owned or Civilian Operated Air Systems the Air System Sponsor can split Type Airworthiness (TAW) responsibility between the Type Airworthiness Authority (TAA) and a Type Airworthiness Manager (TAM), the TAA **should** provide advice to the Sponsor on the most appropriate split of responsibilities¹. Dependant on the agreed split of TAW design responsibilities TAM may be read in place of TAA as appropriate throughout this RA.
2. The DO **should** review this RA in its entirety, noting the term DO throughout includes DO, CDO and Air System CDO. Therefore, CDO and Air System CDO may be read in place of DO as appropriate throughout this RA.
3. The DO **should**:
 - a. Meet the responsibilities as defined².
 - b. Maintain its DO Exposition (DOE) in conformity with the Design Management System (DMS).
 - c. Ensure that the DOE references the basic working documents within the organization.

¹ Where the Air System is not UK MOD-owned, TAW management regulatory responsibility by either the TAA or TAM needs to be agreed within the Sponsor's approved model; refer to RA 1162 – Air Safety Governance Arrangements for Civilian Operated (Development) and (In-Service) Air Systems, or refer to RA 1163 – Air Safety Governance Arrangements for Special Case Flying Air Systems. Dependant on the agreed delegation of TAW responsibilities TAM may be read in place of TAA as appropriate throughout this RA.

² Refer to RA 1014 – Design Organizations and Co-ordinating Design Organizations – Airworthiness Responsibilities.

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5850(1)**

- d. Determine that the design of Products, Parts, Appliances, Airborne Equipment and Air Launched Weapons (ALW) or changes or Repairs thereof, comply with applicable Airworthiness requirements or contracted specifications and have no feature that can lead to an unsafe condition.
- e. Provide to the TAA or Commodity Chief Engineer (CE) associated documentation confirming compliance, and when applicable a Certificate of Design (CofD)^{3, 4, 5}.
- f. Ensure TAA or Commodity CE is provided access to the Design data, including instructions associated with unsafe conditions such as Airworthiness Directives⁶ (AD), Service Bulletins⁶ (SB) for civil-derived Air Systems, or Special Instructions (Technical) (SI(T))⁷ for military designed Air Systems.

**Guidance
Material
5850(1)**

Responsibilities of a Design Organization

4. The role of the DO, CDO or Air System CDO to meet the Airworthiness responsibilities of RA 1014² will be established by the TAA.

**Regulation
5850(2)**

Scheme Inclusion and Approval Award

- 5850(2) An organization **shall** be included in the DAOS and awarded approval for a defined range of Products, Parts, Appliances, Airborne Equipment and ALW, only when the organization has been assessed and approved by the Military Aviation Authority (MAA).

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5850(2)**

Scheme Inclusion and Approval Award

5. An organization seeking inclusion in the scheme **should** apply using MAA DAOS Form 80, which can be found on the MAA website under Approval Schemes⁸, through the MOD sponsor to the MAA.
6. Before a review of the organization's design, development and post-design support arrangements is undertaken, the DO **should** satisfy the MAA that:
 - a. It is in the interests of MOD to include the organization in the Scheme.
 - b. The organization holds Quality Management System (QMS) Certification to AS/EN 9100, or to ISO 9001 providing the scope of the Certification covers the proposed DO Terms of Approval.

**Guidance
Material
5850(2)**

Scheme Inclusion and Approval Award

7. Inclusion in DAOS is normally an essential pre-requisite for the award of design and development contracts for Air Systems (including their Products, Parts and Appliances), Airborne Equipment and ALWs. Although it is understood that an organization may wish to bid for a contract, it is the TAA or Commodity CE's responsibility to consider whether, in this case, the organization is capable of holding a DAOS approval. The DAOS approval is recognition that the MOD accepts that an organization has demonstrated an appropriate standard of compliance and that a specified performance attribute or objective has been achieved.
8. When evidence presented by the organization demonstrates that it satisfies the requirements of RA 5850, a DAOS approval will be issued by the MAA.
9. A list of organizations that have been granted approval is published by the MAA⁹.

³ Refer to RA 5103 – Certificate of Design.

⁴ Refer to RA 5820 – Changes in Type Design (MRP Part 21 Subpart D).

⁵ Refer to RA 5865 – Repairs (MRP Part 21 Subpart M).

⁶ Refer to RA 5805 – Airworthiness Directives and Service Bulletins (MRP Part 21 Subpart A).

⁷ Refer to RA 5405 – Special Instructions (Technical).

⁸ Refer to <https://www.gov.uk/government/publications/design-approved-organization-scheme-daos>.

⁹ Refer to <https://www.gov.uk/government/publications/list-of-maa-approved-organisations>.

**Guidance
Material
5850(2)**

Terms of Approval

10. The Terms of Approval will identify the types of design work, categories of Air Systems (including their Products, Parts and Appliances), Airborne Equipment and ALWs for which the designer can operate as a DO, and the functions and duties that the organization is approved to perform. Those terms will be issued as part of the DO approval.
11. The Terms of Approval encompass the Certificate and Schedule issued by the MAA:
- a. The Certificate identifies the approved organization and its primary design location.
 - b. The Schedule includes:
 - (1) The scope of work (development, design changes and / or Repair and post design services unless otherwise stated), with any appropriate limitations against which the approval has been granted.
 - (2) The categories of Products, Parts, Appliances, Airborne Equipment and ALWs.
 - (3) Airworthiness and design signatories.
 - (4) Military Permit to Fly (MPTF) signatories.
 - (5) Approved TAM.
 - (6) Privileges that can be invoked by the relevant TAA or Commodity CE by contract.
 - (7) TAM responsibilities.
 - (8) Reference to the DOE, provided in accordance with (iaw) RA 5850(4).

Changes to the Terms of Approval

12. An application for a change to the Terms of Approval will be made on MAA DAOS Form 82, which can be found on the MAA website under Approval Schemes⁸.
13. Approval of a change in the Terms of Approval will be confirmed by an appropriate amendment of the Certificate and Schedule as appropriate.

**Regulation
5850(3)**

Design Management System (MRP Part 21.A.239)

- 5850(3) The DO **shall** demonstrate that it has established and is able to maintain a DMS for the control and supervision of the design, and of design changes, of Products, Parts and Appliances, Airborne Equipment and ALWs covered by the application.

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Compliance
5850(3)**

Design Management System (MRP Part 21.A.239)

14. The DO **should** establish, implement and maintain a DMS that includes a Safety Management System and a design Assurance system with clear lines of responsibility and accountability throughout the organization.
15. The DMS **should**:
- a. Correspond to the size of the organization and the nature and complexity of its activities, taking into account the Hazards and the associated Risks that are inherent in these activities; and
 - b. Be established under the direct accountability of a single manager according to Annex A of this RA.
16. The DMS **should** be such as to enable the organization:
- a. To ensure that the design of the Products, Parts and Appliances, Airborne Equipment and ALWs or the design change or Repair solution thereof, comply

Acceptable Means of Compliance 5850(3)

with the applicable Airworthiness requirements or contracted specifications and establish the extent of compliance with the requirements by Inspection, Demonstration, Analysis and Test.

b. To ensure that its responsibilities are properly discharged iaw the RA 5000 series as required by the organization's contract with MOD, and in particular:

- (1) The appropriate provisions of RA 5800 series.
- (2) The Terms of Approval issued under RA 5850(2).
- (3) CofD³.
- (4) Defence Air Safety Management¹⁰.
- (5) Configuration Management of design¹¹.

c. To independently monitor the compliance with, and adequacy of, the documented procedures of the system. This monitoring **should** include a feedback system to a person or a group of persons having the responsibility to ensure corrective actions are resolved.

17. The DO **should** hold regular design reviews to validate the design proposals, completion of which **should** be checked as part of the DMS.

18. The DMS **should** include an independent verification function to validate that the compliance evidence meets Certification requirements, on the basis of which the organization submits a CofD and associated documentation to the TAA or Commodity CE.

19. The DMS **should** ensure that complete Instructions for Sustaining Type Airworthiness (ISTA)¹² and operating instructions (as required), are provided to the TAA or Commodity CE for the Air System, Product, Part, Appliance, Airborne Equipment and ALWs. The DMS **should** ensure that support and updated ISTA and operating instructions are provided, as required, throughout the life cycle of the Air System.

20. The DO **should** specify and document the manner in which the DMS accounts for the acceptability of the Products, Parts or Appliances, Airborne Equipment and ALWs designed and / or the tasks performed by partners or subcontractors.

Guidance Material 5850(3)

Design Management System (MRP Part 21.A.239)

21. The system monitoring function may be undertaken by the existing Quality Assurance organization when the DO is part of a larger organization. For an explanation of the terms used within a DMS refer to Annex A.

22. The independent verification function is undertaken by Compliance Verification Engineers (CVE), as detailed within Annex A; this is a DO focussed role to ensure compliance with the applicable Certification requirements. This is not to be confused with the role of the Independent Technical Evaluator (ITE), who is appointed by the **▶TAA◀**, independent of the DO and will provide independent analysis of the DO evidence.

23. However, when the approved DO is introducing a Minor Change⁴ to the Air System under privilege¹³ the role of the ITE may, in agreement with the TAA, be satisfied by the independent assessment conducted by the CVE.

¹⁰ Refer to RA 1200 – Air Safety Management.

¹¹ Refer to RA 5301 – Air System Configuration Management.

¹² Refer to RA 5815 – Instructions for Sustaining Type Airworthiness.

¹³ Refer to RA 5850(11): Privileges (MRP Part 21.A.263).

**Regulation
5850(4)**

Design Organization Exposition

5850(4) As part of the DMS the DO **shall** furnish a DOE to the MAA describing, directly or by cross-reference, the organization, the relevant procedures and the Products, Parts, Appliances, Airborne Equipment and ALWs to be designed, changed or Repaired.

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5850(4)**

Design Organization Exposition

24. The DOE **should** be produced and include the content detailed in Annex B. The DOE **should** be concise with sufficient information that is relevant to the Terms of Approval sought by the DO. If the DOE is completely or partially integrated into the company organization manual, identification of the information required by RA 5850(4) **should** be provided by giving appropriate cross references and these documents made available to the MAA.

25. Where any Products, Parts, Appliances, Airborne Equipment or ALWs or any changes to these are designed by partner organizations or subcontractors, the DOE **should** articulate how the DO is able to give, for all Products, Parts, Appliances, Airborne Equipment and ALWs, the Assurance of compliance required by RA 5850(3) above. The statement **should** contain, directly or by cross-reference, descriptions and information on the design activities and organization of those partners or subcontractors, as necessary to establish this statement.

26. To maintain DAOS approval, the DOE **should** remain an accurate reflection of the organization with ►significant◀ amendment submitted to the MAA for approval. Amendment submission **should not** be taken to confer that approval for the DAOS change is in place.

27. To demonstrate compliance with RA 5850(4), a DO with a European Union Aviation Safety Agency (EASA) or a UK Part 21 Subpart J approval can use this in support of obtaining a DAOS Approval. In these instances, the DO **should** submit the handbook used in their civil approval providing it covers the required Terms of Approval. In addition, the DO **should** provide the MAA with a supplementary Exposition that identifies the additional measures that have been put in place over and above those set down in its extant civil handbook and associated procedures, to account for the differences in complying with the MAA Regulatory Publications (MRP). For a DO with other civil approvals, a justification **should** be submitted identifying why this is considered appropriate, and advice and agreement **should** be sought from the DAOS branch prior to submission of an application. This **should** demonstrate that the supplemental exposition route is appropriate for the associated Products, Parts, Appliances, Airborne Equipment or ALW.

28. To obtain and maintain approval of a TAM, a DO **should** submit a Type Airworthiness Management Supplement using the template hosted on the MAA Website.

Organization.

29. The DOE **should** show that:

- a. The Head of the DO (HDO) for which an application for approval has been made, has the direct or functional responsibility for all departments of the organization which are responsible for the design of the Products, Parts and Appliances, Airborne Equipment and ALWs. If the departments responsible for design are functionally linked, the HDO still carries the ultimate responsibility for compliance of the organization with this RA.
- b. The HDO has the direct or functional responsibility for all departments of the organization which are involved in the design of changes to design or Repairs to Products, Parts, Appliances, Airborne Equipment and ALWs.
- c. An Office of Airworthiness, or equivalent function, has been established and staffed on a permanent basis to act as the focal point for co-ordinating

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Airworthiness matters; it reports directly to the HDO or is integrated into an independent Quality Assurance organization reporting to the HDO.

- d. Person(s) have been nominated to liaise with the Authority and to co-ordinate Airworthiness matters. Their position in the organization **should** allow direct reporting to the manager responsible for design.
- e. Responsibilities for all tasks related to the design and approval of changes to design or Repairs to Products, Parts, Appliances, Airborne Equipment and ALWs are assigned to ensure that all areas are covered.
- f. Responsibilities for all tasks related to Design Investigations are assigned in such a way that gaps in authority are excluded.
- g. The process for tailoring of the design system is dependant on complexity of design activities.
- h. Co-ordination between technical departments and the Head of Independent System Monitoring (HISM) has been established:
 - (1) To ensure quick and efficient reporting and resolution of difficulties encountered using the DO handbook and associated procedures.
 - (2) To maintain the DMS.
 - (3) To optimize auditing activities.

**Guidance
Material
5850(4)**

Design Organization Exposition

30. A template Design Organization Exposition and Type Airworthiness Management Supplement are provided on the MAA website.

**Regulation
5850(5)**

Approval Requirements (MRP Part 21.A.245)

5850(5) The DO **shall** demonstrate that:

- a. Staff in all technical departments are of sufficient numbers and experience and have been given appropriate authority to discharge their allocated responsibilities.
- b. There is full and efficient coordination between departments and within departments in respect of Airworthiness.

**Acceptable
Means of
Compliance
5850(5)**

Approval Requirements (MRP Part 21.A.245)

General

31. The DO **should** ensure that the accommodation, facilities and equipment are adequate to enable the staff to satisfy the Airworthiness requirements or contracted specifications for the Product, Part, Appliance, Airborne Equipment and ALWs.
32. The data submitted iaw RA 5850(4) **should** show that sufficient skilled personnel are available and suitable technical and organizational provisions have been made for carrying out the Design Investigation¹⁴ defined under RA 5850(3).

Personnel

33. The DO **should** show that the personnel available to comply with this RA are, due to their special qualifications and number, able to provide Assurance of the design, design change or Repair of Products, Parts, Appliances, Airborne Equipment and ALWs, as well as the compilation and verification of all data needed to meet the applicable Certification Specifications.
34. Evidence of their qualifications and experience **should** be documented for the persons who accept the duties defined by the following roles:

¹⁴ The term 'Design Investigation' means the tasks of the organization in support of the Military Type Certificate (MTC) or other Design approval processes necessary to show and verify and to maintain compliance with the applicable Certification Specifications.

**Acceptable
Means of
Compliance
5850(5)**

- a. Chief Executive. A statement of the qualification and experience of the Chief Executive is normally not required unless they are also filling one of the other specified roles (paragraphs 34b-e);
 - b. HDO. ► The position of HDO, due to the nature of the role in the DO, can also hold additional roles such as the TAM where clear independence, sufficient capacity and clear separation of the responsibilities can be demonstrated. ◀
 - c. Head of Airworthiness (HoA);
 - d. HISM. The position of the HISM, due to the nature of the role in independent system monitoring, **should not** be permitted to hold additional roles such as ► TAM, ◀ HDO, HoA or CofD signatory.
 - e. CVE.
 - f. TAM.
35. The credentials of the, HDO, HoA, HISM and TAM **should** be provided to MAA using MAA DAOS Form 4.
 36. Anyone who has authority to sign the CofD, or MPTF (Development) within the DO **should** also provide the MAA with a MAA DAOS Form 4.
 37. For the CVE, no individual statement is needed. CVEs **should** be selected by the DO based on their knowledge, background and experience as defined in the DOE. When necessary, complementary training **should** be established to ensure that CVEs have sufficient background and knowledge in the scope of their authorization.
 38. The DO **should** maintain a record of the CVE personnel, which includes details of the scopes of their authorizations. The CVE personnel **should** be given reasonable access on request to their own records. As part of its investigations, MAA **should** have the right to access the data held in such a system.
 39. Where a TAM holds other roles in the DO, independence **should** be demonstrated.
 40. The DO **should** maintain a record of anyone who has authority to sign the Flight Clearance Note for Non-Production Standard Propulsion Systems in support of a MPTF (Development)¹⁵. As part of its investigations, the MAA **should** be given access to the data held in such a system.

Technical

41. The Chief Executive **should** provide the necessary resources for the proper functioning of the DO.
42. The DO **should** have access to:
 - a. Workshops and production facilities which are suitable for manufacturing prototype models and test specimens.
 - b. Accommodation and test facilities which are suitable for carrying out tests and measurements needed to demonstrate compliance with the applicable Certification Specifications.

**Guidance
Material
5850(5)**

Approval Requirements (MRP Part 21.A.245)

Technical

43. The test Facilities may be subjected to additional technical conditions related to the nature of the tests performed.
44. Staff will be suitably qualified and with commensurate levels of experience appropriate for the role they have been assigned.
45. For smaller DOs, certain roles within the DO may be combined. Combinations of responsibilities are acceptable where:

¹⁵ Refer to RA 5880 – Military Permit to Fly (Development) (MRP Part 21 Subpart P).

**Guidance
Material
5850(5)**

- a. The role of the HDO may be fulfilled by the Chief Executive of the legal entity;
- b. The HDO and the HoA are the same person, provided that the person has the competence to fulfil both functions;
- c. The role of the HISM is an external person for all or part of the role;
- d. A part-time HoA, provided that the person is directly involved in the DO, and not by an agreement between two DOs, and provided that the availability of the person ensures that response times will be adequate.

**Regulation
5850(6)**

Changes in Design Management System (MRP Part 21.A.247)

5850(6) After the issue of a DO Approval, each change to the DMS that is significant to the showing of compliance or to the Airworthiness of the Product, Part, Appliance, Airborne Equipment and ALWs **shall** require approval by the MAA.

**Acceptable
Means of
Compliance
5850(6)**

Changes in Design Management System (MRP Part 21.A.247)

46. An application for approval of a change to the DO **should** be made using MAA DAOS Form 82 and submitted to the MAA. Before implementation of the change the DO **should** demonstrate to the MAA, on the basis of submission of proposed changes to the DOE, that it will continue to comply with this RA after implementation.

**Guidance
Material
5850(6)**

Changes in Design Management System (MRP Part 21.A.247)

Significant changes in the DMS

47. In addition to a change in ownership, the following changes to the DMS will be considered as 'significant' to the showing of compliance or to the Airworthiness of the Products, Parts, Appliances, Airborne Equipment and ALWs:

- a. **Organization**
 - (1) Change in the industrial organization (partnership, suppliers, design work-sharing) unless it can be shown that the independent checking function of the showing of compliance is not affected.
 - (2) Change in the parts of the organization that contribute directly to the Airworthiness (independent checking function, Office of Airworthiness (or equivalent)).
 - (3) Change to the independent monitoring principles.
- b. **Responsibilities.** Change of the management staff assessed for Airworthiness competence:
 - (1) HDO;
 - (2) HoA;
 - (3) HISM;
 - (4) Change of CofD or MPTF signatory;
 - (5) Or, new distribution of responsibilities affecting Airworthiness.
- c. **Procedures.** Change to the principles of procedures related to:
 - (1) The design Certification.
 - (2) The classification of changes and Repairs as Major or Minor⁴.
 - (3) The management of Major Changes and major Repairs.
 - (4) The approval of the design of Minor Changes and minor Repairs¹³.
 - (5) The issue of information and instructions.
 - (6) Documentary changes to the Aircraft Flight Manual.
 - (7) Type Airworthiness.
 - (8) The configuration control, when Airworthiness is affected.

**Guidance
Material
5850(6)**

(9) The acceptance of design tasks undertaken by partners or subcontractors iaw RA 5850(4).

(10) MPTF (Development).

d. **Resources.** Substantial change in the number and / or experience of staff.

**Regulation
5850(7)**

Investigations and Inspections (MRP Part 21.A.257)

5850(7) The DO **shall** make arrangements that allow the MAA to make any investigations, inspections, including investigations of partners and subcontractors, or review any report necessary to determine compliance with this RA.

**Acceptable
Means of
Compliance
5850(7)**

Investigations and Inspections (MRP Part 21.A.257)

48. Arrangements **should** be made to allow the MAA to make investigations of the DO including partners, subcontractors and suppliers. This includes assisting and co-operating with the MAA in performing inspections and Audits conducted during initial assessment and subsequent Assurance.

**Guidance
Material
5850(7)**

Investigations and Inspections (MRP Part 21.A.257)

49. Assistance to the MAA includes all appropriate means associated with the facilities of the DO to allow the MAA to perform these inspections and Audits, such as a meeting room and office support.

**Regulation
5850(8)**

Failures, Malfunctions and Defects

5850(8) The DO **shall** ensure that a robust process is in place for collecting, investigating and analyzing reports of and information related to failures, malfunctions and defects, as identified by themselves, their partners or subcontractors.

**Acceptable
Means of
Compliance
5850(8)**

Failures, Malfunctions and Defects

Failures, Malfunctions and Defect Reporting

50. The DO **should** make appropriate arrangements to report to the TAA or Commodity CE any failure, malfunction, defect or other occurrence related to an Air System, Product, Part or Appliance, Airborne Equipment and ALW and which has resulted in or may result in an unsafe condition.

51. The DO **should** ensure they have a system in place for the management and tracking of failure, malfunction and defect reporting for their Air System, Product, Part or Appliance, Airborne Equipment and ALW that is agreed with the TAA or Commodity CE.

52. The DO **should** notify the TAA or Commodity CE of any potential need for a restriction on flying limitations (or Special Flying Instruction) arising from any reported failure, malfunction or defect.

53. The DO **should** raise and distribute a Narrative Fault Report when:

a. A failure, malfunction or defect occurs which could affect the Safety of personnel, or materiel, or operational effectiveness, or availability of materiel, and which is not of sufficient urgency to require an urgent report being sent but is nevertheless sufficiently important to justify a detailed investigation.

b. When required by a Service Inquiry or as directed by the TAA or Commodity CE.

Acceptable Means of Compliance 5850(8)

Failures, Malfunctions and Defect Investigation and Closure

54. The DO **should** ensure they have a system in place for the investigation of failures, malfunctions and defects for their Air System, Product, Part or Appliance, Airborne Equipment and ALW, that is agreed with the TAA or Commodity CE.
55. In the case of a failure, malfunction or defect arising from a design or production deficiency, the relevant DO or Production Organization, as appropriate, **should** investigate the cause and report the results to the TAA or Commodity CE.
56. When failures, malfunctions and defects are reported on materiel which has been procured as both Contractor Furnished Equipment and Government Furnished Equipment, a common investigation and reporting procedure **should** be used.
57. On receipt of a request for an investigation, the DO **should** call forward all faulty materiel required for investigation.
58. The DO **should** ensure they have a system in place for the rectification and closure of reported failures, malfunctions and defects, that is agreed with the TAA or Commodity CE.

Quarantine

59. The DO **should** ensure that when they are in possession or control of materiel that is reported as faulty, it is quarantined and protected to prevent deterioration or disturbance which may hamper investigation and is disposed of in a controlled manner.

Guidance Material 5850(8)

Failures, Malfunctions and Defects

60. A Narrative Fault Report may be made on a MOD Form 760 Narrative Fault Report or equivalent.
61. Failure, malfunction and defect investigation priorities may be determined by the TAA or Commodity CE.
62. The DO will agree with the MOD individual authorizing the request the format and distribution of investigation reports resulting from data analysis requests.

Regulation 5850(9)

Findings (MRP Part 21.A.258)

- 5850(9) After receipt of notification of findings, the DO **shall** demonstrate corrective action appropriate to the level of the finding.

Acceptable Means of Compliance 5850(9)

Findings (MRP Part 21.A.258)

63. After receipt of notification of findings under the administrative procedures established by the MAA, the DO **should** demonstrate corrective action to the satisfaction of the MAA within the agreed period¹⁶.
64. In the case of a significant finding resulting in the suspension or revocation of their DO Approval¹⁷, the DO **should** provide confirmation of receipt of this notice in a timely manner.

Guidance Material 5850(9)

Findings (MRP Part 21.A.258)

65. In case of a significant finding, the DO may be subject to a partial or full suspension or revocation of its approval.
66. Details of Findings levels and Observations can be found in MAA03¹⁶.
67. The MAA will inform the relevant TAA(s) or Commodity CE and sponsor of any findings and Corrective Action Requirements (CAR).

¹⁶ Refer to MAA03: MAA Regulatory Processes, Annex H – MAA Assurance.

¹⁷ Refer to MAA01: MAA Regulatory Principles.

**Regulation
5850(10)**

Validity of Approval (MRP Part 21.A.259)

5850(10) A DAOS approval **shall** be issued for an unlimited duration and remain valid subject to:

- a. The DO remaining in compliance with applicable RAs;
- b. The MAA or its nominated representative being granted access to the organization to determine continued compliance with applicable RAs; and
- c. The approval Certificate not being surrendered, suspended or revoked.

**Acceptable
Means of
Compliance
5850(10)**

Validity of Approval (MRP Part 21.A.259)

68. The DO **should** confirm in writing prior to any formal MAA assessment or not later than every 3 years from the last notification that the contents of their approval Certificate and DOE remain valid. Failure to provide the required confirmation can result in the suspension of the approval.

**Guidance
Material
5850(10)**

Validity of Approval (MRP Part 21.A.259)

69. Nil.

**Regulation
5850(11)**

Privileges (MRP Part 21.A.263)

5850(11) A DO **shall** operate privileges only when they have been invoked by the appropriate TAA or Commodity CE.

**Acceptable
Means of
Compliance
5850(11)**

Privileges (MRP Part 21.A.263)

Invoking specific privileges

70. The DO **should** only operate privileges when they have had their competence assessed by the MAA, their Terms of Approval contain the relevant provision, and the privileges are invoked in writing by the TAA or Commodity CE.

71. Once invoked, the DO **should** be entitled, within its Terms of Approval and under the relevant procedures of the DMS, to operate the privilege to:

- a. Classify changes to design¹⁸ and Repairs¹⁹ as Minor or Major.
- b. Approve Minor Changes²⁰ and minor Repairs²¹.
- c. Issue information and instructions, containing the following statement: "The technical content of this documentation is approved under the authority of MAA DAOS ref. [UK.MAA.DAOS.xxxx]," where 'xxxx' represents the reference number. NB: This privilege **should not** be used for instructions relating to an unsafe condition²², including ADs⁶ and SI(T)s⁷.
- d. To approve the flight conditions under which a MPTF (Development) can be issued¹⁵, except for initial flights of:
 - (1) A new type of Air System; or
 - (2) An Air System modified by a Major Change; or
 - (3) An Air System whose flight and / or piloting characteristics have been modified; or

¹⁸ Refer to RA 5820(1): Classification of Changes in Type Design (MRP Part 21.A.91).

¹⁹ Refer to RA 5865(3): Classification of Repairs (MRP Part 21.A.435) .

²⁰ Refer to RA 5820(3): Approval of Minor Changes (MRP Part 21.A.95).

²¹ Refer to RA 5865(5): Issue of a Repair Design Approval (MRP Part 21.A.435).

²² Refer to RA 5825 – Fault Reporting and Investigation.

**Acceptable
Means of
Compliance
5850(11)**

(4) An Air System dedicated to expanding the agreed flight envelope, as defined within an extant Release To Service²³ (RTS).

e. Issue a MPTF (Development)¹⁵ for an Air System it has designed or modified, or for which it has approved the conditions under which the MPTF (Development) can be issued and when the DO itself is controlling the configuration of the Air System under its scope of DO approval, noting that the Privileged DO cannot issue the initial MPTF (Development).

72. The DO **should** develop its own internal procedures for the relevant privileges identified in paragraph 71, based on the requirements of Annex C.

73. The DO **should** assure the TAA or Commodity CE that any changes approved under the provision of any privilege that has been invoked are accurately classified.

74. The DO **should** assure the TAA or Commodity CE that there is a robust mechanism for managing the configuration control of the Air System or equipment for any changes approved under the provisions of any privilege that has been invoked.

75. The DO **should** provide the TAA or Commodity CE or their authorized representative a declaration that the change or Repair has been approved.

76. The TAA or Commodity CE or their authorized representative **should** acknowledge receipt of declaration of approval.

77. The TAA or Commodity CE **should** make appropriate arrangements for Configuration Management in conjunction with the DO, to ensure that the application of design changes, including any SI(T) or SB to the same Air System or equipment, is managed effectively and is transparent to the Operating Duty Holder.

78. The privileges invoked **should** remain valid until such time as they are surrendered, suspended or revoked. In the situation where the individual invoking the privileges departs their post, the privileges invoked **should** remain valid for a maximum period of 3 months until such time as the new incumbent can re-assess the award of privileges. The privileges **should** be automatically revoked if not re-awarded within the 3 month period.

**Guidance
Material
5850(11)**

Privileges (MRP Part 21.A.263)

Invoking Specific Privileges

79. Whilst the TAA or Commodity CE has the ability to revoke privileges, the MAA holds the ultimate sanction of limiting the scope of an organization's approval if it is deemed the ►TAA◄ or organization is not fully compliant with the MRP.

80. The information and instructions, including the necessary data, are issued by the DO to the TAA or Commodity CE to implement a change, a Repair, or an inspection. Some are also issued to provide Maintenance organizations with all necessary Maintenance data for the performance of Maintenance, including implementation of a change, a Repair, or an inspection.

81. The preparation of this data involves design, production and inspection. As the overall responsibility, through the privilege, is allocated to the DO, these aspects will be properly handled by the DO to obtain the privilege "to issue information and instructions containing a statement that the technical content is approved", and a procedure will exist.

82. In derogation to para 71 sub-paras a to d, for a military Air System derived from a civil type certified Air System, the holder of a MAA DAOS approval may be entitled to declare to the TAA the applicability, through validation of no impact to the military Certification basis and the intended use, of the following when it has already been approved by an MAA agreed civil aviation authority or a DO²⁴ utilizing its civil-approval privilege:

a. A Minor design change; or

²³ Refer to RA 1300 – Release To Service.

²⁴ Where an Alternative Acceptable Means of Compliance has been approved by the MAA for use of the civil approval under RA 1005 – Contracting with Competent Organizations or RA 1014 – Design Organizations and Co-ordinating Design Organizations - Airworthiness Responsibilities.

**Guidance
Material
5850(11)**

- b. An ISTA; or
- c. Revisions to the flight manual.

**Regulation
5850(12)**

Designs using Government Furnished Equipment

5850(12) The DO **shall** obtain the authority of the MOD before altering the design of any Government Furnished Equipment (GFE).

**Acceptable
Means of
Compliance
5850(12)**

Designs using Government Furnished Equipment

83. If the DO has any doubt about the design suitability of any item, or has proposals for design changes, they **should** advise the MOD at the earliest opportunity.

**Guidance
Material
5850(12)**

Designs using Government Furnished Equipment

84. The installation, functional and environmental interface definitions documentation may be formally referred to as the Interface Control Documentation (ICD).

85. Where GFE is provided without the appropriate supporting Design Records (eg CofD, ICD), the DO will communicate the omission to the relevant TAA or Commodity CE for their decision to proceed with the design change.

**Regulation
5850(13)**

Record Keeping

5850(13) All relevant design information, drawings, test reports, including inspection records and Type Airworthiness Management information **shall** be held by the appropriate DO, and available if required.

**Acceptable
Means of
Compliance
5850(13)**

Record Keeping

86. Such documentation **should** be held in order to provide the information necessary to ensure the Type Airworthiness of an Air System and be retained²⁵.

**Guidance
Material
5850(13)**

Record Keeping

87. International or collaborative programmes will be required to co-ordinate custodianship of appropriate documentation.

²⁵ Refer to RA 1225 – Air Safety Documentation Audit Trail.

Annex A**Design Management System (DMS)****Definitions**

1. The system monitoring function may be undertaken by the existing Quality Assurance organization when the DO is part of a larger organization.
2. The DMS is the organizational structure, responsibilities, procedures and resources to ensure the proper functioning of the DO.
3. The DMS includes a Safety Management System and a design Assurance system with clear lines of responsibility and accountability throughout the organization. Design Assurance means all those planned and systematic actions necessary to provide adequate confidence that the organization has the capability:
 - a. To design Products, Parts or Appliances iaw the applicable Certification Specifications.
 - b. To show and verify the compliance with the applicable Certification Specifications, or Product, Part, Appliance, Airborne Equipment and ALW specifications.
 - c. To demonstrate to the MAA this compliance for the purposes of DAOS approval and to the TAA when required.

Design Management System

4. The complete process starts with the Certification Specifications and Product, Part and Appliance specifications that culminates in Type Certification. It establishes the relationship between the design, the Design Investigation and design Assurance processes.
5. Effective design Assurance demands a continuing evaluation of factors that affect the adequacy of the design for intended applications, in particular that the Product, Part or Appliance, complies with applicable Certification Specifications and will continue to comply after any change. Such changes include amendment to place of manufacture, manufacturing methods or material sources²⁶.
6. Two main aspects **should** therefore be considered:
 - a. How the planned and systematic actions are defined and implemented, from the very beginning of design activities up to Type Airworthiness activities;
 - b. How these actions are regularly evaluated and corrective actions implemented as necessary.

Design Management System - Independent checking function of the showing of compliance

7. The independent checking function of the showing of compliance **should** consist of the verification by a person not creating the compliance data. Such person may work in conjunction with the individuals who prepare compliance data.
8. The verification **should** be shown by signing compliance documents, including test programmes and data.
9. There is normally only one CVE nominated for each Certification Specification, or Product, Part and Appliance specifications for a given design activity.
10. A procedure **should** cover the non-availability of nominated persons and their replacement when necessary.

Planned and Systematic Actions

11. For the DO carrying out Design Investigation of Products, Parts, Appliances, Airborne Equipment and ALW, the subsequent tasks and procedures will be defined and put in place to cover the planned and systematic actions.

General

12. To issue or, where applicable, supplement or amend the DOE iaw RA 5850(6), in particular to indicate the initiation of design activities on a Product, Part, Appliance, Airborne Equipment and ALW.
13. To assure that all instructions of the DOE are adhered to.
14. To nominate staff as CVEs responsible to approve compliance documents.

²⁶ A change in place or method of manufacture or a change of explosive material or source of explosive material will require Independent Ordnance, Munitions and Explosives Safety Advisor advice; refer to DSA 02.OME(2) – Appointment of an Independent OME Safety Advisor.

15. To nominate personnel belonging to the Office of Airworthiness with appropriate responsibilities.
16. To ensure full and complete liaison between the DO and related organizations having responsibility for Products, Parts and Appliances manufactured to the specification.
17. To provide the Assurance to the TAA or Commodity CE that prototype models and test specimens adequately conform to the design.

Chief Executive and HDO (or their Deputy)

18. The Chief Executive will provide the necessary resources for the proper functioning of the DO.
19. The HDO, or an authorized representative, **should** sign a CofD³ stating compliance with the applicable Certification Specifications, or Product, Part, Appliance, Airborne Equipment and ALW specifications, after verification of satisfactory completion of the Design Investigation. law RA 5810²⁷ and RA 5820⁴, their signature on the CofD confirms that the procedures as specified in the DOE have been followed.
20. The functions of Chief Executive and HDO may be performed by the same person.

Compliance Verification

21. Approval by signing of all compliance documents, including test programmes and data, necessary for the verification of compliance with the applicable Certification Specifications as defined in the Certification Programme.
22. Internal approval of the technical content (eg completeness, technical accuracy), including any subsequent revisions, of the manuals for the subsequent release by the TAA or Commodity CE.

Office of Airworthiness

23. Liaison between the DO and the TAA or Commodity CE with respect to all aspects of the Certification programme.
24. Ensuring that a DOE is prepared and updated as required in RA 5850(4).
25. Co-operation with the MAA in developing procedures to be used for the design Certification process.
26. Issuing of guidelines for documenting compliance.
27. Co-operation in issuing guidelines to ensure compliance with the Regulations for the preparation of the manuals, SB, SI(T), design changes, drawings, specifications and standards.
28. Ensuring distribution of applicable Certification Specification and other specifications.
29. Co-operating with the TAA or Commodity CE in proposing the Type Certification Basis.
30. Interpretation of Certification Specification and requesting decisions of the TAA or Commodity CE.
31. Advising of all departments of the DO in all questions regarding Airworthiness approvals and Certification.
32. Preparation of the Certification programme and co-ordination of all tasks related to Design Investigation in concurrence with the TAA or Commodity CE.
33. Regular reporting to the TAA or Commodity CE about Design Investigation progress and announcement of scheduled tests in due time.
34. Ensuring co-operation in preparing inspection and test programmes needed for demonstration of compliance.
35. Establishing and maintaining the compliance checklist to provide evidence underpinning the Compliance Statement.
36. Checking that all compliance documents are prepared as necessary to show compliance with all Certification Specifications, as well as for completeness, and signing for release of the documents.
37. Checking the required design definition documents described in RA 5810 and ensuring that they are provided to the TAA or Commodity CE for approval when required.
38. Preparation, if necessary, of a draft for a Type Certificate Data Sheet and / or Type Certificate Data Sheet Modification.

²⁷ Refer to RA 5810 – Military Type Certificate (MRP Part 21 Subpart B).

39. Providing verification to the HDO that all activities required for Design Investigation have been properly completed.
40. Approving the classification of changes⁴ and granting the approval for Minor Changes when appropriately privileged to do so.
41. Monitoring of significant events on other aeronautical Products, Parts, Appliances, Airborne Equipment and ALW as far as relevant to determine their effect on Airworthiness of Products, Parts, Appliances, Airborne Equipment and ALW being designed by the DO.
42. Ensuring co-operation in preparing SB, SI(T) and the Structural Repair Manual and subsequent revisions, with special attention being given to the manner in which the contents affect Certification Specifications for subsequent approval by the TAA or Commodity CE.
43. Ensuring the initiation of activities as a response to failure (Air Safety Occurrences) evaluation and complaints from the operation and providing of information to the TAA or Commodity CE in case of Airworthiness impairment.
44. Advising the TAA or Commodity CE with regard to the issue of SI(T).
45. Ensuring that the manuals to be approved by the TAA or Commodity CE, including any subsequent revisions are checked to determine that they meet the respective requirements and that they are provided to the TAA or Commodity CE for approval.

Maintenance and Operating Instructions

46. Ensuring the preparation and updating of all Maintenance and operating instructions needed to maintain Airworthiness iaw relevant Certification Specifications. For that purpose, the DO will:
 - a. Establish the list of all documents it is producing; and
 - b. Define procedures and organization to produce and issue these documents to the TAA or Commodity CE.

Continued Effectiveness of the Design Management System

47. The organization **should** establish the means by which the continuing evaluation (system monitoring) of the DMS will be performed in order to ensure that it remains effective.

Annex B

Design Organization Exposition Requirements

Part 1 - Organization

1. Document title and Organizations document reference number.
2. Organization name, address, telephone, telex, facsimile numbers, e-mail address.
3. Index.
4. List of effective pages with revision / date / amendment identification for each page.
5. Distribution list.
6. Objective of DOE and binding statement.
 - a. The DOE **should** be signed by the Chief Executive and the HDO and declared as a binding instruction for all personnel charged with the development and Design Investigation of Products, Parts, Appliances, Airborne Equipment and ALW.
7. Responsible person(s) for administration of the DO handbook.
8. Amendments.
 - a. Amendment record sheet.
 - b. A system **should** be clearly laid down for carrying out amendments to the DOE, including how amendments are identified within the document.
9. Presentation of DO (including locations).
 - a. An introduction, or foreword, explaining the purpose of the document for the guidance of the organization's own personnel. Brief general information concerning the history and development of the organization and, if appropriate, relationships with other organizations which can form part of a group or consortium, **should** be included to provide background information for the MAA.
10. Scope of work (with identification of type and models of Products, Parts, Appliances, Airborne Equipment and ALW) according to the following classification:
 - a. General areas, eg type of Air Systems, Product, Part, Appliance, Airborne Equipment and ALW.
 - b. Technologies handled by the organization (composite, wood or metallic construction, electronic systems, software, etc).
 - c. A list of types and models for which the design approval has been granted and for which privileges can be exercised, supported by a brief description for each Products, Parts, Appliances, Airborne Equipment and ALW.
 - d. For Repair design, classification and (if appropriate) approval activities it is necessary to specify the scope of activity in terms of Products, Parts, Appliances, Airborne Equipment and ALW.
11. Organization structure.
 - a. A description of the organization, its departments, their functions and the names of those in charge: a description of the line management.
 - b. A description of functional relationships between departments, including assigned responsibilities and delegated authority of all parts of the organization which, taken together, constitute the organization's DMS.
 - c. A general description of the way in which the organization performs its functions in relation to the Airworthiness and continued operational suitability of the product it designs, including co-operation with the Production Organization when dealing with any Airworthiness actions that are related to production of the Product, Part, Appliance, Airborne Equipment and ALW as deemed applicable by the TAA or Comodity CE.
 - d. A chart indicating the functional and hierarchical relationship of the DMS to Management and to other parts of the organization within the DMS and the control of the work of all partners and sub-contractors.

12. Human resources.
 - a. A description of the human resources, facilities and equipment, which constitutes the means for design and where appropriate, for ground and flight testing.
 - b. An outline of the system for controlling and informing the Staff of the organization of current changes in engineering drawings, specifications and design Assurance procedures.
13. Management staff.
 - a. A description of assigned responsibilities and delegated authority of all parts of the organization which, taken together constitute the organization's DMS; also, the chains of responsibilities within the DMS, and the control of the work of all partners and subcontractors.
14. Record Keeping.
 - a. A description of the recording system for:
 - (1) The design, including relevant design information, drawings and test reports, including inspection records of test specimens.
 - (2) The means of compliance.
 - (3) The compliance documentation (compliance check list, reports).
15. Certifying personnel.
 - a. The names of the DO authorized signatories. Nominated persons with specific responsibilities **should** be listed.
 - b. A clear definition of the tasks, competence and areas of responsibility of the Office of Airworthiness.
 - c. A statement of Suitably Qualified and Experienced Person(s) (SQEP) responsible for making decisions affecting Airworthiness in the organization.
16. Independent system monitoring.
 - a. A description of the means by which the continuing evaluation (system monitoring) of the DMS will be performed in order to ensure that it remains effective.
17. Evidence of a QMS Certification (as defined by the Defence Authority for Technical and Quality Assurance Mandatory Requirement for Appropriate Certification) to AS/EN 9100, or to ISO 9001 providing the scope of Certification covers the proposed DO Terms of Approval.
18. A description of the means by which the organization monitors and responds to problems affecting the Airworthiness or operational suitability of its product during design, production and In-Service.
19. A description of the procedures for the establishment and the control of the Maintenance and operating instructions as instructed by the TAA.

Part 2 - Procedures

20. A general description of the way in which the organization performs all the design functions in relation to Airworthiness, operational approvals including:
 - a. The procedures followed and forms used in the design investigation process to ensure that the design of, or the change to the design of, the product as applicable is identified and documented and complies with the applicable Certification Specifications, including contracted requirements.
 - b. The procedures for classifying design changes as 'Major' or 'Minor' and for the approval of Minor changes, if appropriately privileged to do so.
 - c. The procedures for classifying and approving unintentional deviations from the approved design data occurring in production (concessions or non-conformances), if appropriate to do so²⁸.
 - d. The procedures for re-establishing a Type Design definition for Parts and Appliances of orphaned Products or for obsolete Parts and Appliances, for which the original design drawings or data no longer exist.
 - e. The procedure for classifying and obtaining approval for Repairs, if appropriately privileged to do so.

²⁸ Refer to Def Stan 05-061 Part 1 – Quality Assurance Procedural Requirements – Concessions.

- f. The procedures for the establishment and the control of the Maintenance and operating instructions
 - g. The procedures for the establishment and the control of the MPTF (Development).
 - h. The procedures and controls related to the utilization of Artificial Intelligence within the design and development process. The DOE **should** make clear where and how this is utilized in relation to the DOs approval scope.
21. In addition, the organization controls and records the design documentation and means of compliance for:
- a. The basic Product, Part, Appliance, Airborne Equipment and ALW.
 - b. Design changes to the Product, Part, Appliance, Airborne Equipment and ALW.
 - c. The design schemes for Product, Part, Appliance, Airborne Equipment and ALW Repairs.
 - d. The reporting and response to Product, Part, Appliance, Airborne Equipment and ALW failures / malfunctions and defects.
22. The organization **should** identify (by reference or explicit description) the procedures it uses to select subcontractors and manage the design of Products, Parts, Appliances, Airborne Equipment and ALW produced.
23. The organization **should** identify (by reference or explicit description) the procedures it uses to control design production, including production by subcontractors charged with the design and production of Products, Parts, Appliances, Airborne Equipment and ALW and subcontractors charged with production of the approved design. Procedures **should** include:
- a. Changes in manufacturing location, method, source material.
 - b. Where novel production processes such as additive manufacturing are utilized.
24. Control of design subcontractors.
25. Co-ordination with production.
26. Sustained Airworthiness.
- a. A description of the way in which the organization performs its functions in relation to the Sustained Airworthiness of the Product, Part, Appliance, Airborne Equipment and ALW it designs.
27. Collecting / Investigating failures, malfunctions and defects.
- a. A description of the means by which the organization monitors and responds to problems affecting the Airworthiness of its Product, Part, Appliance, Airborne Equipment and ALW.

Guidance Material - Statement of Qualifications and Experience

28. Three different types of functions are named or implicitly identified, using qualified and experienced personnel:
- a. The Chief Executive.
 - b. The other management staff:
 - (1) HDO.
 - (2) HoA.
 - (3) The HISM.
 - c. Personnel making decisions affecting Airworthiness:
 - (1) CVE.
 - (2) Personnel of the Office of Airworthiness making decisions affecting Airworthiness, especially those linked with the privileges identified in RA 5850(11) approving the classification of changes, Repairs and granting the approval of Minor Changes.

Chief Executive

29. The Chief Executive **should** provide the necessary resources for the proper functioning of the DO. A statement of the qualification and experience of the Chief Executive is normally not required.

Other Management Staff

30. The person or persons nominated **should** represent the management structure of the organization and be responsible through the HDO to the Chief Executive for the execution of all functions as specified in RA 5850. Depending on the size of the organization, the functions can be subdivided under individual managers.

31. The nominated managers **should** be identified and their credentials furnished to the MAA on MAA DAOS Form 4 in order that they can be seen to be appropriate in terms of relevant knowledge and satisfactory experience related to the nature of the design activities as performed by the organization.

32. The responsibilities and the tasks of each individual manager **should** be clearly defined, in order to prevent uncertainties about the relations, within the organization. Responsibilities of the managers **should** be defined in a way that all responsibilities are covered.

Personnel making decisions affecting Airworthiness

33. For personnel making decisions affecting Airworthiness, no individual statement is required. The applicant **should** show to the MAA that there is a system to select, train, maintain and identify them for all tasks where they are necessary. The following guidelines for such a system are proposed:

- a. These personnel **should** be identified in the DO handbook, or in a document linked to the DO handbook. This and the corresponding procedures are there to enable them to carry out the assigned tasks and to properly discharge associated responsibilities.
- b. The needs, in terms of quantity of these personnel to sustain the design activities, **should** be identified by the organization.
- c. These personnel **should** be chosen based on their knowledge, background and experience.
- d. When necessary, complementary training **should** be established, to ensure sufficient background and knowledge in the scope of their authorization. The minimum standards for new personnel to qualify in the functions **should** be established. The training **should** lead to a satisfactory level of knowledge of the procedures relevant for the role.
- e. Training policy forms part of the DMS and its appropriateness forms part of the investigation by the MAA within the organization approval process and subsequent surveillance of persons proposed by the organization.
- f. This training **should** be adapted in response to experience gained within the organization. The organization **should** maintain a record of these personnel which includes details of the scope of their authorization. The personnel concerned **should** be provided with evidence of the scope of their authorization.

34. The following minimum information **should** be kept on record:

- a. Name.
- b. Experience and training.
- c. Position in organization.
- d. Scope of the authorization.
- e. Date of first issue of the authorization.
- f. If appropriate, date of expiry of the authorization.
- g. Identification number of the authorization.

35. The record can be kept in any format and **should** be controlled:

- a. Persons authorized to access the system **should** be kept to a minimum to ensure that records are not altered in an unauthorized manner or that such confidential records do not become accessible to unauthorized persons.
- b. Personnel can be given access to their own record.
- c. Under the provision of RA 5850(7) the MAA **should** have access to the data held in such a system.
- d. The organization **should** keep the record for at least 2 years after a person has ceased employment with the organization or revocation of the authorization, whichever is the sooner.

Annex C

Internal Procedures for Operating Specific Privileges

Classify changes to Design and Repairs as Minor or Major (refer to RA 5850 paragraph 71.a)

Intent

1. The DO **should** develop its own internal procedure for the classification of changes to design and Repairs as Minor or Major in order to obtain the associated privilege.

Content

2. The procedure **should** address the following points:
 - a. The identification of changes to design or Repairs.
 - b. Classification.
 - c. Justification of the classification.
 - d. Authorized signatories.
 - e. Supervision of changes to design or Repairs initiated by subcontractors.
3. For changes to design, criteria used for classification **should** be in compliance with RA 5820.
4. For Repairs, criteria used for classification **should** be in compliance with RA 5865⁵.

Identification of changes to design or Repairs

5. The procedure **should** indicate how the following are identified:
 - a. Major Changes to design or major Repairs.
 - b. Those Minor Changes to design or minor Repairs where additional work is necessary to show compliance with the applicable Certification Specifications.
 - c. Other Minor Changes to design or minor Repairs requiring no further showing of compliance.

Classification

6. The procedure **should** show how the effects on Airworthiness are analysed, from the very beginning, by reference to the applicable Certification requirements.
7. If no specific Certification Specifications are applicable to the change or Repairs, the above review **should** be carried out at the level of the Product, Part, Appliance or system where the change or Repair is integrated and where specific Certification Specifications are applicable.

Justification of the classification

8. All decisions of classification of changes to design or Repairs as Major or Minor **should** be recorded. These records **should** be easily accessible to the TAA for sample check.

Authorized signatories

9. All classifications of changes to design or Repairs **should** be accepted by an appropriate authorized signatory.
10. The procedure **should** indicate the authorized signatories for the various Products, Parts, Appliances, Airborne Equipment and ALW listed in the Terms of Approval.
11. For those changes or Repairs that are handled by subcontractors, it **should** be described how the DO manages its classification responsibility.

Supervision of changes to design or Repairs initiated by subcontractors

12. The procedure **should** indicate, directly or by cross-reference to written procedures, how changes to design or Repairs **should** be initiated and classified by subcontractors and are controlled and supervised by the DO.

Approve Minor Changes to design and minor Repairs (refer to RA 5850 paragraph 71.b)

Intent

13. The DO **should** develop its own internal procedure for the approval of Minor Changes to design or minor Repairs in order to obtain the associated privilege.

Content

14. The procedure **should** address the following points:
- a. Compliance documentation.
 - b. Approval under the DO privilege.
 - c. Authorized signatories.
 - d. Supervision of Minor Changes to design or minor Repairs handled by subcontractors.

Compliance documentation

15. For those Minor Changes to design or minor Repairs where additional work to show compliance with the applicable Certification Specifications is necessary, compliance documentation **should** be established and independently checked as required by RA 5850(3).

16. The procedure **should** describe how the compliance documentation is produced and checked.

Approval under the DO privilege

17. For those Minor Changes to design or minor Repairs where additional work to show compliance with the applicable Certification Specifications is necessary, the procedure **should** define who the change is approved by under the DO privilege.

18. This document **should** include at least:
- a. Identification and brief description of the change or Repair and reasons for change or Repair.
 - b. Applicable Certification Specifications and methods of compliance.
 - c. Reference to the compliance documents.
 - d. Effects, if any, on limitations and on the approved documentation.
 - e. Evidence of the independent checking function of the showing of compliance.
 - f. Evidence of the approval under the privilege of RA 5850(11) by an authorized signatory.
 - g. Date of the approval.

19. For the other Minor Changes to design or minor Repairs, the procedure **should** define a means to identify the change or Repair and reasons for the change or Repair and to formalise its approval by the appropriate engineering authority under an authorized signatory. This function can be delegated by the Office of Airworthiness but **should** be controlled by the Office of Airworthiness, either directly or through appropriate procedures of the DO Design Management System.

Authorized signatories

20. The persons authorized to sign for the approval under privilege **should** be identified (name, signature and scope of authority) in appropriate documents that are linked to the DO handbook.

Supervision of Minor Changes to design or minor Repairs handled by subcontractors

21. For the Minor Changes to design or minor Repairs that are handled by subcontractors, the procedure **should** indicate, directly or by cross-reference to written procedures how these Minor Changes to design or minor Repairs are approved at the subcontractor level and the arrangements made for supervision by the DO.

Issue of information and instructions (refer to RA 5850 paragraph 71.c)**Intent**

22. The DO **should** develop its own internal procedure for the issue of information and instructions.

Content

23. For the information and instructions issued under this privilege, the DO **should** establish a procedure addressing the following points:
- a. Preparation.
 - b. Verification of technical consistency with corresponding approved change(s), Repair(s) or approved data, including effectivity, description, effects on Airworthiness, especially when limitations are changed.
 - c. Verification of the feasibility in practical applications.

d. Authorized signatories.

24. The procedure **should** include the information and instructions prepared by subcontractors or vendors and declared applicable to its Products, Parts, Appliances, Airborne Equipment and ALW by the DO.

Statement

25. The statement provided in the information and instructions **should** also cover the information and instructions prepared by subcontractors or vendors and declared applicable to its Products, Parts and Appliances by the DO.

26. The technical content **should** be related to the Design Records and accomplishment instructions and its approval **should** mean that:

- a. The Design Records has been appropriately approved.
- b. The instructions provide for practical and well defined installation / inspection methods and, when accomplished, the Products, Parts, Appliances, Airborne Equipment and ALW are in conformity with the approved Design Records.

27. Where appropriate, this technical data **should** be clearly identified within the CofD for the TAA or Commodity CE.

28. Information and instructions related to required actions issued under an AD or SI(T) **should** be submitted to the TAA to ensure compatibility with the AD or SI(T) content and **should** contain a statement that they are, or soon to be, subject to an AD or SI(T) issued.

To approve the flight conditions under which a MPTF (Development) can be issued (refer to RA 5850 paragraph 71.d)

Intent

29. The DO **should** develop its own internal procedure to determine and approve that an Air System can fly under the appropriate restrictions compensating for the lack of an extant RTS.

Content

30. The procedure **should** address the following points:

- a. Decision to use the privilege.
- b. Management of the Air System configuration.
- c. Determination of the conditions that **should** be complied with to perform safe flight.
- d. Documentation of flight conditions substantiations.
- e. Approval under the approved DO privilege, when applicable.
- f. Authorized signatories.

31. The procedure **should** include a decision to determine:

- a. Flights for which this privilege can be exercised.
- b. Flights for which the approval of flight conditions by the TAA are required.

32. The procedure **should** indicate:

- a. How the Air System, for which an application for a MPTF (Development) is made, is identified and how changes to the Air System **should** be managed.

Determination of the conditions that should be complied with to perform safe flight

33. The procedure **should** describe the process used by the DO to justify that an Air System can perform the intended flight. The process **should** include:

- a. Identification of deviations from the extant RTS or applicable Airworthiness requirements.
- b. Analysis, calculations, tests or other means used to determine the conditions or restrictions under which the Air System can perform safe flight.
- c. The establishment of specific Maintenance instructions and conditions to perform these instructions.

- d. Independent technical verification of the analysis, calculations, tests or other means used to determine under which conditions or restrictions the Air System can perform the intended flight(s) safely.
- e. Statement by the Office of Airworthiness (or equivalent), that the determination has been made iaw the procedure and that the Air System has no features and characteristics making it unsafe for the intended operation under the identified conditions and restrictions.
- f. Approval by an authorized signatory.

Documentation of flight conditions substantiations

34. The analysis, calculations, tests, or other means used to determine the conditions or restrictions under which the Air System can perform in flight safely, **should** be compiled in compliance documents. These documents **should** be signed by the author and by the person performing the independent technical verification.
35. Each compliance document **should** have a number and issue date. The various issues of a document **should** be controlled.

Authorized signatories

36. The person(s) authorized to sign the approval form **should** be identified (name, signature and scope of authority) in the procedure, or in an appropriate document linked to the DOE.

Issue a MPTF (Development) iaw RA 5880 (refer to RA 5850 paragraph 71.e)

Intent

37. The DO **should** develop its own internal procedure for the issue of a MPTF (Development)¹⁵ for an Air System it has designed or modified, or for which it has approved under privilege the conditions under which the MPTF (Development) can be issued and when the DO itself is controlling under its DO Terms of Approval the configuration of the Air System and is attesting conformity with the design conditions approved for the flight.

Content

38. The procedure **should** address the following points:
- a. Conformity with approved conditions.
 - b. Issue of the MPTF (Development) under privilege in the scope of the DO approval.
 - c. Authorized signatories.
 - d. Interface with the TAA for the flight.

Conformity with approved conditions

39. The procedure **should** indicate how conformity with approved conditions is made, documented and attested by an authorized person.

Issue of the MPTF (Development) under the DO privilege

40. The procedure **should** describe the process to prepare the MPTF (Development) and how compliance is established before signature of the MPTF (Development).

Authorized signatories

41. The person(s) authorized to sign the MPTF (Development) under the privilege in the scope of the DO approval **should** be identified (name, signature and scope of authority) in the procedure, or in an appropriate document linked to the DOE.

Interface with the TAA for the flight

42. The procedure **should** include provisions describing the communication with the TAA for compliance with the local requirements which are outside the scope of the flight conditions.

RA 5865 – Repairs (MRP Part 21 Subpart M)

Rationale

During the design and development of ► **Air Systems**, ◀ consideration will be given to the possible need for Repairs. It is important that only approved organizations undertake the design of such Repairs. Failure to correctly control the Repair process may result in unforeseen outcomes. Design Organizations (DO) whose terms of approval covers the classification or the design of Repairs are subject to certain obligations relating to those approvals.

Contents

- 5865(1): Scope (MRP Part 21.A.431A)
- 5865(2): Demonstration of Capability (MRP Part 21.A.432B)
- 5865(3): Classification of Repairs (MRP Part 21.A.435)
- 5865(4): Repair Design (MRP Part 21.A.433)
- 5865(5): Issue of a Repair Design Approval (MRP Part 21.A.435)
- 5865(6): Production of Repair Parts (MRP Part 21.A.439)
- 5865(7): Repair Embodiment (MRP Part 21.A.441)
- 5865(8): Limitations (MRP Part 21.A.442)
- 5865(9): Unrepaired Damage (MRP Part 21.A.445)
- 5865(10): Record Keeping (MRP Part 21.A.447)

Regulation

5865(1)

Scope (MRP Part 21.A.431A)

5865(1) The term “Repair” **shall** be understood to mean the elimination of damage and / or restoration to an airworthy condition ► **and approved configuration**. ◀

The elimination of damage by replacement of Parts or Appliances without the necessity for design activity **shall** be considered as a Maintenance task and therefore require no approval under this Regulation.

Acceptable Means of Compliance

5865(1)

Scope (MRP Part 21.A.431A)

1. Standard Repairs that follow design data published in the Instructions for Sustaining Type Airworthiness (ISTA)¹, containing acceptable methods, techniques and practices for carrying out and identifying standard Repairs, **should** require no additional approval under this Regulation.

Guidance Material

5865(1)

Scope (MRP Part 21.A.431A)

2. Nil.

Regulation

5865(2)

Demonstration of Capability (MRP Part 21.A.432B)

5865(2) The Type Airworthiness Authority (TAA) or Commodity Chief Engineer (CE) **shall** ensure that the DO holds an extant approval from the MAA under the Design Approved Organization Scheme (DAOS) covering the relevant scope of activities².

¹ Refer to RA 5815 – Instructions for Sustaining Type Airworthiness.

² Refer to RA 5850 – Military Design Approved Organization (MRP Part 21 Subpart J).

**Acceptable
Means of
Compliance
5865(2)**

Demonstration of Capability (MRP Part 21.A.432B)

3. For Civilian-Owned / Civilian Operated Air Systems the Air System Sponsor has the opportunity to split Type Airworthiness (TAW) responsibility, with regards to Repairs, between the TAA and a Type Airworthiness Manager (TAM), the TAA **should** provide advice to the Sponsor on the most appropriate split of TAW Repair responsibilities³, noting that a TAM **should not** authorize major Repairs.
4. The TAA or Commodity CE **should** enable a direct interface between the Product, Part, Appliance, Airborne Equipment and Air Launched Weapons DO and the DO designing the Repair for the availability of appropriate Design Records and the timely provision of Design advice when requested by the DO designing the Repair.
5. The DO **should** have the appropriate Design Records and staff to Design and conduct airworthy Repair schemes.

**Guidance
Material
5865(2)**

Demonstration of Capability (MRP Part 21.A.432B)

6. Nil.

**Regulation
5865(3)**

Classification of Repairs (MRP Part 21.A.435)

- 5865(3) A Repair **shall** be classified major or minor either by the TAA or by a privileged DO⁴.

**Acceptable
Means of
Compliance
5865(3)**

Classification of Repairs (MRP Part 21.A.435)

7. A new repair **should** be classified as major if the result on the approved Type Design has an appreciable effect on structural performance, weight, balance, Systems, operational characteristics or other characteristics affecting the Airworthiness of the Product, Part or Appliance.
8. A Repair **should** be classified as major if it needs extensive static, fatigue and damage tolerance strength justification and / or testing in its own right, or if it needs methods, techniques or practices that are unusual (ie unusual material selection, heat treatment, material processes, jiggling diagrams, etc).
9. Repairs that require a re-assessment and re-evaluation of the original certification substantiation data to ensure that the Air System still complies with all the relevant requirements **should** be considered major Repairs.
10. The DO **should** provide a recommended classification, with supporting justification, to the TAA for all major Repairs.
11. For major Repairs, the TAA **should** consider if a Change to the Type Design⁵ is a better solution than repairing the Air System.

**Guidance
Material
5865(3)**

Classification of Repairs (MRP Part 21.A.435)

Clarification of the term's major / minor

12. It is understood that not all the Certification substantiation data will be available to those persons / organizations classifying repairs. A qualitative judgement of the effects of the Repair will therefore be acceptable for the initial classification. The subsequent review of the design of the Repair may lead to it being re-classified, owing to early judgements being no longer valid.

Airworthiness concerns for major / minor classification

13. The following are to be considered for the significance of their effect when classifying Repairs. If the effect is considered to be significant then the Repair is to be

³ Where the Air System is not UK MOD-owned, Type Airworthiness (TAW) management regulatory responsibility by either the TAA or TAM needs to be agreed within the Sponsor's approved model; refer to RA 1162 - Air Safety Governance Arrangements for Civilian Operated (Development) and (In-Service) Air Systems, or refer to RA 1163 - Air Safety Governance Arrangements for Special Case Flying Air Systems. Dependant on the agreed delegation of TAW responsibilities TAM may be read in place of TAA as appropriate throughout this RA.

⁴ Invoked in accordance with (iaw) RA 5850 – Military Design Approved Organization (MRP Part 21 Subpart J).

⁵ Refer to RA 5820 – Changes in Type Design.

**Guidance
Material
5865(3)**

classified major. The Repair may be classified as minor where the effect is known to be without appreciable consequence. Considerations for classifying Repairs major / minor are not limited to those listed below:

- a. **Structural performance.** Structural performance of the product includes static strength, fatigue, damage tolerance, flutter and stiffness characteristics. Repairs to any element of the structure are to be assessed for their effect upon the structural performance.
 - b. **Weight and Moment.** The weight of the Repair may have a greater effect upon smaller Air Systems as opposed to larger Air System's. The effects to be considered are related to overall Centre of Gravity (CofG) and load distribution. Control surfaces are particularly sensitive to the changes due to the effect upon the stiffness, mass distribution and surface profile which may have an effect upon flutter characteristics and controllability.
 - c. **Systems.** Repairs to any elements of a System are to be assessed for the effect intended on the operation of the complete System and for the effect on System redundancy. The consequence of a structural Repair on an adjacent or remote System are also to be considered as above, (for example: airframe Repair in the area of a static port).
 - d. **Operational characteristics** Changes may include:
 - (1) Stall characteristics.
 - (2) Handling.
 - (3) Performance and drag.
 - (4) Vibration.
 - e. **Other characteristics**
 - (1) Changes to load path and load sharing.
 - (2) Change to noise and emissions.
 - (3) Fire protection / resistance.
14. Examples of major Repairs:
- a. A Repair that requires a permanent additional inspection to the approved Maintenance schedule, necessary to ensure the TAw of the product.
 - b. A Repair to life limited or critical parts.
 - c. A Repair that introduces a change to the Aircraft Flight Manual⁶.

Note:

Temporary Repairs for which specific inspections are required prior to installation of a permanent Repair do not necessarily need to be classified as major. Also, inspections and changes to inspection frequencies not required as part of the approval to ensure TAw do not cause classification as major of the associated Repair.

**Regulation
5865(4)**

Repair Design (MRP Part 21.A.433)

5865(4) The applicant for approval of a Repair Design **shall** demonstrate its compliance with the Type Certification Basis (TCB) plus any amendments to the TCB.

⁶ The Aircraft Flight Manual contains the limitations within which the Air System is to be considered airworthy, and instructions and information necessary to the flight crew for the safe operation of the Air System ie the Aircrew Manual in military terms.

**Acceptable
Means of
Compliance
5865(4)**

Repair Design (MRP Part 21.A.433)

15. A Repair to a (European) Technical Standard Order ((E)TSO)⁷ article **should** be treated as a change to the (E)TSO design and **should** be processed in accordance with the issuing authority procedures.

16. The applicant for approval of a Repair design **should** submit all necessary substantiation data (eg analysis, calculations or tests) to the TAA⁸.

17. The TAA **should** consider the implications of a Repair scheme embodied that does not restore static strength, stiffness, fatigue life, functionality and Airworthiness to the original design levels, in order that consideration can be given to the need for an amendment to the Air System Release To Service (RTS).

18. Any Repair not meeting design limitations **should** be recorded and agreed with the TAA.

Repair schemes

19. The DO **should** respect any extant design limits and comply with the following requirements:

a. The DO **should** notify the TAA where an RTS limitation may be necessary following the incorporation of an approved Repair scheme.

b. Where there is a Repair, any limitations prescribed by the Air System DO or ►TAA◄ for structure, aerodynamics, weight, CofG, and Systems (including software) **should** be respected. Designs **should not** transgress such limitations without the written technical agreement of the Air System DO for the Air System concerned.

c. Arrangements **should** exist for all Repair schemes, where technical advice or written technical agreement is required, as defined by paragraph 19b above, to be passed to the Air System DO. The Air System DO **should** provide advice as to whether or not the proposed Repair transgresses the prescribed design limitations.

d. The DO **should** seek the written approval of the TAA to design any Repair where the Air System DO advise that prescribed design limitations will be transgressed.

20. In designing Air System Repairs the DO **should** comply with the following requirements:

a. The Air System DO **should** be consulted by the DO designing the Repair when there is no valid precedent, principle, DO Repair Instruction or sufficient evidence to prove restoration with the TCB.

b. A complete list of all Repair schemes, and consequently changes to the Air System build standard, **should** be forwarded to the ►TAA◄ for the Air System affected, for configuration management purposes and Maintenance of any Design Records.

c. Consideration **should** be given to whether the approved Repair scheme has a sufficiently wide application to be included in the ISTA¹.

21. Repair schemes **should** individually identify the designing DO.

Repair Design substantiation data

22. Relevant substantiation data associated with the design of a new major Repair and record keeping **should** include:

a. Damage identification and reporting source.

b. Major Repair design approval sheet identifying applicable specifications and references of justifications.

c. Repair drawing and / or instructions and scheme identifier.

⁷ The (E)TSO abbreviation **should** be taken to mean a TSO from the USA or a European TSO.

⁸ Note not applicable for minor Repairs approved under privilege.

**Acceptable
Means of
Compliance
5865(4)**

- d. Correspondence with the TAA, DO or (E)TSO approval holder, if its advice on the design has been sought.
 - e. Structural justification (static strength, fatigue, damage tolerance, flutter etc) or references to this data.
 - f. Effect on the Air System, engines and / or Systems (performance, flight handling, etc as appropriate).
 - g. Effect on the Maintenance schedule.
 - h. Effect on Airworthiness limitations, the Flight Manual and the Operating Manual.
 - i. Weight and balance change.
 - j. Special test requirements.
23. Relevant minor Repair documentation **should** include paragraphs 22a and 22c. Other points of paragraph 22 **should** be included where necessary. If the Repair is outside the approved Type Design, justification for classification **should** be provided.

**Guidance
Material
5865(4)**

Repair Design (MRP Part 21.A.433)

24. The term 'Repair scheme' will be taken to include 'Repair instructions'.
25. When manuals and other instructions for TAw are as approved, they may be used by operators without further approval to cope with anticipated In-Service problems arising from normal usage provided that they are used strictly for the purpose for which they have been developed.

Repair schemes

26. Repair schemes which restore the original structural designer's intent inherently meet the full load spectrum of the Air System design. A Repair scheme is not a Modification and therefore a full Safety Assessment (SA), iaw Def Stan 00-056⁹, is not required in order to substantiate the Repair's Structural Integrity (SI) and Airworthiness.
27. A list of DO approved Repair schemes which have not been included in the ISTA will be retained in a master list forming part of the Design Records.

**Regulation
5865(5)**

Issue of a Repair Design Approval (MRP Part 21.A.435)

- 5865(5) The TAA **shall** ensure that the Repair design complies with the applicable TCB prior to approval.

**Acceptable
Means of
Compliance
5865(5)**

Issue of a Repair Design Approval (MRP Part 21.A.435)

28. The approval for major Repair designs **should** be issued only:
- a. By the TAA.
 - b. For minor Repairs by the TAA or by an appropriately privileged DO.
29. In order for the TAA to approve Repair designs the following **should** be applicable:
- a. The TCB for the Product, Part or Appliance to be repaired has been identified together with all other relevant requirements.
 - b. All records and substantiation data including documents showing compliance with all relevant Certification Specifications are held for review by the MAA.
30. All major Repairs **should** be accompanied with a Certificate of Design (CofD) and installation instructions¹⁰.

⁹ Refer to Def Stan 00 – 056 – Safety Management Requirements for Defence Systems.

¹⁰ Note: A minor Repair has no appreciable effect on Airworthiness as it is returning the item to the approved certification basis, a CofD will not be required for a minor Repair.

**Acceptable
Means of
Compliance
5865(5)**

31. A summary list of all Repair approvals **should** be provided to the TAA on a regular basis as agreed.

Air Systems Type Certified by the MAA

32. The TAA **should** seek MAA approval in cases of major Repairs proposed by DO approval holders, if the major Repair is:

- a. Related to new interpretation of the Certification Specifications as used for Type Certification.
- b. Related to different means of compliance from that used for Type Certification.
- c. Related to the application of Certification Specifications different from that used for Type Certification.

**Guidance
Material
5865(5)**

Issue of a Repair Design Approval (MRP Part 21.A.435)

33. **Approval by DO.** Approval of Repairs through the use of privileges invoked by the TAA¹, means an approval issued by the DO without requiring TAA involvement. The MAA will monitor application of this procedure within the surveillance plan for the relevant organization. When the organization exercises this privilege, the Repair release documentation is to clearly state that the privilege has been identified under their DAOS approval.

34. **Previously approved data for other applications.** When it is intended to use previously approved data for other applications, it is expected that applicability and effectiveness would be checked with an appropriately approved DO. After damage identification, if a Repair solution exists in the available approved data, and if the application of this solution to the identified damage remains justified by the previous approved Repair design, (structural justifications still valid, possible Airworthiness limitations unchanged), the solution can be considered approved and can be used again.

35. **Temporary Repairs.** These are Repairs that are life limited, to be removed and replaced by a permanent Repair after a limited service period. These Repairs are to be classified under RA 5865(3) and the service period defined at the approval of the Repair and recorded in the Technical Log.

36. **Fatigue and damage tolerance.** When the repaired Product is released into service before the fatigue and damage tolerance evaluation has been completed, the release is to be for a limited period, defined at the issue of the Repair.

**Regulation
5865(6)**

Production of Repair Parts (MRP Part 21.A.439)

5865(6) Parts and Appliances to be used for the Repair **shall** be manufactured iaw production data based upon all the necessary Design data as provided by the DO:

- a. By an appropriately recognized¹¹ Production Organization (PO); or
- b. By an Approved Maintenance Organization (AMO)¹², or a Military Maintenance Organization (MMO)¹³.

**Acceptable
Means of
Compliance
5865(6)**

Production of Repair Parts (MRP Part 21.A.439)

37. Parts or Appliances used for the Repair **should** be appropriately marked¹⁴.

¹¹ Refer to RA 5835 – Production Organizations (MRP Part 21 Subpart G).

¹² Refer to RA 4800 to RA 4821 (MRP Part 145).

¹³ Refer to RA 4809 – Acceptance of Components (MRP 145.A.42).

¹⁴ Refer to RA 5885 – Identification of Products, Parts and Appliances (MRP Part 21 Subpart Q).

**Guidance
Material
5865(6)**

Production of Repair Parts (MRP Part 21.A.439)

38. Nil.

**Regulation
5865(7)**

Repair Embodiment (MRP Part 21.A.441)

5865(7) The embodiment of a Repair **shall** be made:

- a. By an appropriately recognized¹¹ PO; or
- b. By an AMO¹⁵ or MMO using the necessary installation instructions issued by the TAA or a privileged DO¹⁶.

**Acceptable
Means of
Compliance
5865(7)**

Repair Embodiment (MRP Part 21.A.441)

39. The TAA or a privileged DO **should** transmit to the organization performing the Repair all the necessary installation instructions.

**Guidance
Material
5865(7)**

Repair Embodiment (MRP Part 21.A.441)

40. Nil.

**Regulation
5865(8)**

Limitations (MRP Part 21.A.443)

5865(8) The instructions and any limitations for a Repair design **shall** be submitted by the Repair design approval holder to the TAA.

**Acceptable
Means of
Compliance
5865(8)**

Limitations (MRP Part 21.A.443)

41. Any limitations associated with major Repairs **should** be identified in the CofD¹⁷.

**Guidance
Material
5865(8)**

Limitations (MRP Part 21.A.443)

42. Nil.

**Regulation
5865(9)**

Unrepaired Damage (MRP Part 21.A.445)

5865(9) When a damaged Product, Part or Appliance is left unrepaired and is not covered by previously approved data, the TAA or a privileged DO **shall** approve its continued use.

**Acceptable
Means of
Compliance
5865(9)**

Unrepaired Damage (MRP Part 21.A.445)

43. When the DO evaluates the unrepaired damage for its Airworthiness consequences, they **should** inform the TAA.

44. When the organization evaluating the unrepaired damage is neither the TAA nor the DO, this organization **should** justify that the information on which the evaluation is based is adequate either from its own resources or through an arrangement with the original DO.

¹⁵ Appropriately approved iaw RA 4800 – RA 4821 (MRP Part 145).

¹⁶ Where there is a Continuing Airworthiness Management Organization, these instructions are to be transmitted through them to the AMO or MMO.

¹⁷ Refer to RA 5103 – Certificate of Design.

**Acceptable
Means of
Compliance
5865(9)**

45. The TAA **should** evaluate the unrepaired damage for Airworthiness consequences and if in any doubt, **should** consult with the DO.

**Guidance
Material
5865(9)****Unrepaired Damage (MRP Part 21.A.445)**

46. This is not intended to supersede the normal Maintenance practices defined by the DO, (eg blending out corrosion and re-protection, stop drilling cracks, etc), but addresses specific cases not covered in the ISTA.

47. A damaged Product, Part or Appliance that is left unrepaired can be approved for its continued use by a TAA.

**Regulation
5865(10)****Record Keeping (MRP Part 21.A.447)**

5865(10) For each Repair, all relevant design information, drawings, test reports, instructions and limitations issued iaw RA 5865, justification for classification and evidence of the Repair design approval, **shall**:

- a. Be held by the Repair design approval holder at the disposal of the TAA.
- b. Be retained by the Repair design approval holder in order to provide the information necessary to ensure the TAW of the repaired Products, Parts or Appliances.

**Acceptable
Means of
Compliance
5865(10)****Record Keeping (MRP Part 21.A.447)**

48. Nil.

**Guidance
Material
5865(10)****Record Keeping (MRP Part 21.A.447)**

49. Nil.