

## RA 5301 – Air System Configuration Management

### Rationale

*During the development and In-Service life of an Air System (and related Products, Parts, Appliances), Airborne Equipment and Air Launched Weapons (ALW) there will be changes in design. ► Failure to control the configuration of the Air System (and related Products, Parts and Appliances) may compromise Type Airworthiness (TAW) and Air Safety. ◀ In order to preserve TAW and ensure the Air System remains safe to operate, it is necessary to implement strict management of the design configuration. This is achieved by carrying out Configuration Management (CM) in accordance with (iaw) a defined plan under the supervision of a management board. This is a joint endeavour between Industry and MOD stakeholders, with the lead for specific responsibilities moving from Industry to MOD during the project lifecycle. This Regulatory Article (RA) details the regulatory requirements that facilitate the management of design Configuration and records, through the life of the design.*

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### Regulation 5301(1)

#### Configuration Management Principles

5301(1) The Type Airworthiness Authority (TAA)<sup>1</sup> **shall** manage the Configuration of their Air System (and related Products, Parts, Appliances), Airborne Equipment and ALW iaw an agreed Configuration Management Plan (CMP) under the oversight of an established design Configuration governance system.

### Acceptable Means of Compliance 5301(1)

#### Configuration Management Principles

1. CM activities **should** be conducted iaw a CMP prepared to the applicable requirements of Defence Standard (Def Stan) 05-057<sup>2</sup>.
2. A CMP **should** be maintained throughout the life of the Air System (including related Products, Parts, Appliances), Airborne Equipment and ALW.
3. As a minimum, a CMP **should**:
  - a. Reference the Configuration Status Record (CSR) management process to enable the Configuration of an item to be established at any time during its life cycle.
  - b. Detail the principal CM activities of planning, identifying, changing, accounting, ► ◀ Auditing and ► **verifying** ◀ an item's Configuration.
4. A governance system **should** be established comprising of Configuration Control Boards (CCB)<sup>3</sup> and supporting committees as required to review and make decisions on changes to design and to ensure the effective delivery of the agreed change programme.
5. The procedures for a CCB, its chairpersonship and mandatory attendees **should** be included in the CMP. In order to provide the necessary support, and input appropriate recommendations, a CCB **should** consist of, as a minimum, the following members each of whom will have executive authority<sup>4</sup>:

<sup>1</sup> Refer to RA 5301(2) for the TAA / Design Organization (DO) relationship when Under Contractor Control (UCC).

<sup>2</sup> Refer to Def Stan 05-057 – Configuration Management of Defence Materiel.

<sup>3</sup> DOs may use different terminology but CCB is used throughout this Regulation for convenience to describe the management board responsible for dispositioning design changes.

<sup>4</sup> The TAA or Commodity Chief Engineer (Commodity CE) will require appropriate delegations to make the required commercial commitments or be supported by staff with the required authority.

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- a. TAA<sup>5</sup> or Commodity CE (Chair<sup>6</sup>).
  - b. Representative(s) of the DO(s) affected (Chair<sup>7</sup>).
  - c. TAM (if applicable).
  - d. Specialist adviser(s) (if required)<sup>8</sup>.
  - e. Representative(s) of the Service user(s) and Military Continuing Airworthiness Manager (Mil CAM).
  - f. Representative(s) of the Production Organization (PO)<sup>9</sup> (if not the DO).
  - g. Representative of the Release To Service Authority (RTSA) when discussing changes which could necessitate an update of the extant Release To Service (RTS)<sup>10</sup>.
6. Generic CCB Responsibilities **should** include the need to:
- a. Consider and make decisions on proposed changes to design which affect project performance, cost, timescale or delivery.
  - b. Define and approve the limits of delegated authority to any subordinate committees.
  - c. Review and improve CM processes as required.
  - d. Ensure compliance with CM processes.
7. A CSR **should** be prepared by the DO and maintained through life iaw the requirements of Def Stan 05-057 to enable effective management of design Configuration and Design Records<sup>11</sup>.
8. The TAA or Commodity CE **should** ensure that the DO retains the Design Records and manufacturing data relating to the articles supplied or the work performed under the contract for a minimum of 5-years beyond the Product's, Part's, Appliance's, Airborne Equipment's and ALW's Out-of-Service date<sup>12</sup>. The master copy of any Design Record **should not** be altered during this period without the written permission of the TAA or Commodity CE.
9. The TAA or Commodity CE **should** ensure that the DO tasking arrangements facilitate provision of copies of particular CSR and Design Records in an agreed format when requested.
10. The outcome from the CCB **should** be recorded in ►a manner that provides an Auditable trail<sup>12</sup>. ◀
- CM of Flight Simulation Training Devices (FSTD)**
11. The TAA **should** consider possible effects of Air System Design Changes on the CM of associated FSTD. Any Design Changes that are considered to affect this parity **should** be passed to the relevant FSTD Senior Responsible Owner (SRO)<sup>13</sup>.

<sup>5</sup> Where the Air System is not UK MOD-owned, 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.

<sup>6</sup> The TAA or Commodity CE will chair the CCB when the design is Under Ministry Control – see RA 5301(3).

<sup>7</sup> The DO will chair the CCB when the design is Under Contractor Control – see RA 5301(2).

<sup>8</sup> Specialist roles may include Safety, Environmental, Quality, Commercial or Finance.

<sup>9</sup> Refer to RA 5835 – Production Organizations (MRP Part 21 Subpart G).

<sup>10</sup> Refer to RA 1300 – Release To Service.

<sup>11</sup> Refer to MAA02 – MAA Master Glossary.

<sup>12</sup> Refer to RA 1225 – Air Safety Documentation Audit Trail.

<sup>13</sup> Where an SRO is not appointed the Operating Duty Holder (ODH), Accountable Manager (Military Flying) (AM(MF)) or In-Service Capability Manager, on behalf of the ODH or AM(MF), **should** fulfil this responsibility, ie In-Service Modification where an SRO is not appointed or Contractor Flying Approved Organization Scheme.

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## Configuration Management Principles

12. Initial Configuration Control of the design is vested in the DO who manages the CSR. This contains the indexes to drawings, documentation, specifications and design changes, including ancillary equipment, packaging and Service-supply items. It is to be kept up to date through-life on behalf of the TAA or Commodity CE by the DO. The CSR provides a baseline for defining the Configuration state through-life. Normally a CSR is produced for each item of equipment<sup>14</sup> for which a Certificate of Design (CofD)<sup>15</sup> is required upon delivery of the equipment to the TAA or Commodity CE.
13. The DO is responsible for the design of equipment to meet the specification based on a development programme, within the constraints imposed by the contract.
14. CM will need to be applied by the DO and TAA or Commodity CE in order to:
- Maintain effective control of the approved Configuration.
  - Ensure that change proposals are processed in a timely manner and are appropriately justified with a documented Audit trail.
  - Apply an embodiment priority classification<sup>16</sup> based on the urgency and applicability of the change.
  - Enable the implementation of authorized changes and make use of Configuration Status Accounting<sup>2</sup> to track progress from concept through to completion.
  - Ensure that the impact of individual design changes are assessed across the whole Air System (and related Products, Parts, Appliances), Airborne Equipment and ALW and that a review process maintains the agreed progress of embodiment.
  - Ensure that a focal point for the Maintenance of CM is appointed and individual authorities and responsibilities for CM are identified within a DO / Delivery Team (DT)<sup>17</sup>.
  - Ensure that all relevant supporting information for CM is included during the UCC / Under Ministry Control (UMC)<sup>18</sup> transition. This will include the plan and supporting information (eg Configuration baseline, control system, data, decision histories and Audit trail records).
15. The Knowledge in Defence<sup>19</sup> and the DE&S Air Engineers Toolkit Design Configuration Management Tools websites provides governing policy that outlines the CM principles to be applied by a DO, TAA, Commodity CE and their suppliers to ensure that equipment design is effectively managed through life.

### Configuration Management Plan

16. The CMP will be used to define how the CM requirements of an item will be managed throughout the life cycle of the item. An overview of the main requirements is provided below with further detail in Def Stan 05-057.
- Purpose, scope and programme milestones.
  - Organization structures, committees and Responsibilities.
  - Configuration change management procedures.
  - Change control of the CM documentation.

<sup>14</sup> For convenience, 'equipment' refers to the Air System, Product, Part, Appliance, Airborne Equipment or ALW which is being managed by the TAA or Commodity CE within the context of the relevant paragraph.

<sup>15</sup> Refer to RA 5103 – Certificate of Design.

<sup>16</sup> This is the classification of the Modification as detailed in Def Stan 05-057; it must not be confused with classification as Major or Minor iaw RA 5820 – Changes in Type Design (MRP Part 21 Subpart D). Input will be required from the end users of the modified item.

<sup>17</sup> ► Where the term DT or Commodity DT is used in this RA, this may include the TAM and organizations supporting the TAM. ◀

<sup>18</sup> During development, and before designs are brought UMC, the DO is free to alter the design, without reference to the MOD, within the constraints of the specification.

<sup>19</sup> Refer to <https://www.gov.uk/guidance/knowledge-in-defence-kid> and Defence Equipment & Support (DE&S) Air Engineers Toolkit Design Configuration Management Tools.

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- e. Interfaces with other plans.
- f. Procedures for auditing compliance with CM requirements.

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5301(2)**

**Configuration Management Under Contractor Control**

5301(2) Whilst the design is UCC, the DO **shall** lead CM activities.

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**Configuration Management under Contractor Control**

17. A CMP **should** be developed by the DO and agreed with the TAA or Commodity CE at the commencement of the contract and **should** be subject to review and revision ►◀ as the design progresses.
18. Within the CMP, the DO **should** establish the CCB to bring ► the design under formal control. ◀ At this phase of the project the CCB **should**:
- a. Prepare and maintain a provisional CSR.
  - b. Record and control the standard of design to be manufactured.
  - c. Make available to the TAA or Commodity CE the record of its decisions.
19. The TAA or Commodity CE **should** be invited to the CCB when the schedule to bring the design(s) UMC is to be discussed. Interim arrangements **should** be agreed by which the TAA or Commodity CE will gain sufficient knowledge and control over the Air System, Product, Part, Appliance, Airborne Equipment or ALW Configuration to accept transfer to UMC.
20. Prior to the Design Records being brought UMC, the TAA or Commodity CE **should** establish the Local Technical Committee (LTC), ensuring that Terms of Reference are agreed by the CCB and detailed in the CMP.
21. The DO **should** make the CSR available for issue to the TAA or Commodity CE before the design transitions to UMC unless alternative arrangements have been made via the CCB.
22. If the design is not brought UMC by the time of initial RTS, the TAA **should** set out the plan within the RTS Recommendations for achieving UMC and how CM for In-Service Air Systems will be managed.

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23. The design will be UCC during the project development phase which would typically end at acceptance of the CofD when the design will normally transition to UMC. The transition to UMC does not necessarily mean that the design fully meets the specification.
24. Formal control of the design will be required as a lead-in to the process of bringing the design UMC. It may also be required when long lead-time items need to be ordered. Formal control will normally be progressive as each group of designs becomes sufficiently stable.
25. The CofD will be produced when the TAA or Commodity CE and the DO agree, via the CCB, that the design adequately meets the requirements of the specification within the limits and exceptions stated.

**Regulation  
5301(3)**

**Configuration Management under Ministry Control**

5301(3) Whilst the design is Under Ministry Control, the TAA or Commodity CE **shall** lead CM activities.

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26. The TAA **should** ensure that the approved Air System Configuration is accurately documented in the Air System Document Set<sup>20</sup>.
27. The TAA or Commodity CE **should** ensure that their CMP describes the CM dependencies with the DO and interfacing Products, Parts, Appliances, Airborne Equipment and ALW.
28. The CCB **should** be chaired by the TAA or Commodity CE who **should** ensure the required attendance. In addition to the generic CCB ► **Responsibilities** ◀ listed in paragraph 6, the CCB **should**:
- Approve the development of Modifications based on LTC recommendations.
  - Authorize the DO<sup>21</sup> to proceed with approved changes iaw the agreed commercial arrangements.
  - Approve the recommended Modification classification<sup>16</sup> and roll-out plan from the LTC<sup>22</sup>.
  - Set requirements for monitoring compliance with the DO's CMP so that UMC can be assured.
29. After the design is brought UMC, the TAA or Commodity CE **should** authorize any change to the Design Records using the procedures detailed in the agreed CMP.
30. The TAA or Commodity CE **should** chair ►<sup>23</sup>◀ the LTC and ensure the required mandatory attendance as detailed in the CMP.
31. The LTC **should** make recommendations to the CCB based on technical scrutiny of design change proposals.
32. The outcome of the LTC **should** be recorded in ► **a manner that provides an Auditable trail**<sup>12</sup>. ◀

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33. A TAA ►<sup>17</sup>◀ will have a CMP for each Mark or Type for which they hold Responsibility. A Commodity CE will have a CMP for Products, Parts, Appliances, Airborne Equipment and ALW that may be subject to design changes. The relationship between an Air System and its ► **support organizations** ◀ will be recorded in the Air System Airworthiness Strategy<sup>24</sup> and Support Policy Statement<sup>25</sup>, and managed via appropriate business agreements.
34. The TAA or Commodity CE will ensure that, where items are shared across multiple DTs, CM is strictly maintained and duplicated activities are avoided.
35. For smaller and more simple programmes it may be appropriate to combine the CCB and LTC into a suitable single forum, but the CMP will clearly articulate how the intent of this Regulation is met.

**Local Technical Committee**

36. ► ◀
37. An LTC will consist of the following members:
- TAA or Commodity CE (Chair).

<sup>20</sup> Refer to RA 1310 – Air System Document Set.

<sup>21</sup> Refer to RA 5850 – Military Design Approved Organization (MRP Part 21 Subpart J).

<sup>22</sup> Def Stan 05-057 Annex E describes potential embodiment considerations; the Mil CAM will manage embodiment by platform tail number.

<sup>23</sup> ► It is only acceptable for the TAA or Commodity CE to delegate chairpersonship of LTC meetings to appropriate Letter of Airworthiness Authority (LoAA) or Letter of Air Safety Notification (LoAN) holders when formalized arrangements are in place for the TAA or Commodity CE to be fully informed of the outcomes of the LTC. ◀

<sup>24</sup> Refer to RA 5010 – Type Airworthiness Strategy.

<sup>25</sup> Refer to RA 5407 – Support Policy Statement.

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- b. TAM (if applicable).
  - c. Specialist ►◀ representatives as required<sup>8</sup>.
  - d. Representative(s) of the DO(s) affected.
  - e. Representative(s) of the PO<sup>9</sup> if not the DO.
  - f. RTSA representative when discussing changes which could necessitate an update of the extant RTS.
  - g. Additional representatives of ► organizations ◀ affected by the proposed changes.
  - h. Subject Matter Experts to advise on specialist technical aspects.
38. The members detailed in the CMP, or by exception deputies fully empowered to act on their behalf, will be present at all LTC meetings.
39. The LTC will provide a forum for dealing with technical and associated matters, including design changes, to make decisions and where necessary make recommendations to the CCB for Modification proposals and their classification. An LTC is the committee through which the Design Records are managed.
40. The LTC ► recorded outputs ◀ will reference any significant changes to the information given on a Modification Proposal Form<sup>2</sup> and the effects thereof.
41. Although the greater part of the activity of an LTC is devoted to design changes and associated Modifications, it is not intended that it be limited to such work. It can also officiate as a means of resolving, or referring to MOD, local questions which may arise in the implementation of specified technical requirements, such as whether a new CofD may be required<sup>26</sup>, or whether a change in a design, manufacture or supply process will necessitate requalification testing.
42. An LTC may deal with a range of equipment at a contractor's<sup>27</sup> premises, or more than one LTC may be established at a contractor's premises to deal with different types of equipment. The range of each LTC will be agreed by the TAA or Commodity CE setting up the LTC using the process detailed in the respective CMP.

<sup>26</sup> Refer to RA 5305(3): In-Service Design Changes – Modification Procedure.

<sup>27</sup> Contractor is used as a generic term to include industry organizations who may be involved in the design or production of relevant Products, Parts, Appliances, Airborne Equipment or ALW.