



Ministry of Defence Defence Standard 05-57

Issue 5 Publication Date 17 June 2005

Configuration Management of Defence Materiel



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Foreword

AMENDMENT RECORD

Amd No	Date	Text Affected	Signature and Date

REVISION NOTE

This Standard has been raised to Issue 5 to update its technical content through the inclusion of Configuration Management requirements particular to the Air, Land and Maritime environments.

HISTORICAL RECORD

This standard supersedes the following:

Def Stan 05-57 Issue 4 Amdt 1 Dated 2nd February 2001

Def Stan 05-57 Issue 3 dated 31 March 1993 'Configuration Management of Defence Materiel',

INTERIM Def Stan 05-57 Issue 2 dated 2 September 1985 'Configuration Management Policy and Procedures for Defence Materiel'

INTERIM Def Stan 05-57 Issue 1 Dated 4 July 1980 'Configuration Management Requirements for Defence Equipment'

This standard provides requirements for the Configuration Management (CM) of defence materiel in support of Ministry of Defence (MOD) projects.

- a) This standard has been produced on behalf of the Defence Material Standardization Committee (DMSC) by a Configuration Management Working Group (CMWG) set up under the sponsorship of Defence Quality Assurance Authority (DQAA).
- b) This standard has been agreed by the authorities concerned with its use and is intended to be used whenever relevant in all future designs, contracts, orders etc. and whenever practicable by amendment to those already in existence. If any difficulty arises which prevents application of the Defence Standard, UK Defence Standardization (DStan) shall be informed so that a remedy may be sought.
- c) Any enquiries regarding this standard in relation to an invitation to tender or a contract in which it is incorporated are to be addressed to the responsible technical or supervising authority named in the invitation to tender or contract.
- d) Compliance with this Defence Standard shall not in itself relieve any person from any legal obligations imposed upon them.
- e) This standard has been devised solely for the use of the Ministry of Defence (MOD) and its contractors in the execution of contracts for the MOD. To the extent permitted by law, the MOD hereby excludes all liability whatsoever and howsoever arising (including, but without limitation, liability resulting from negligence) for any loss or damage however caused when the standard is used for any other purpose.

Introduction

This Standard is the CM requirement to be invoked in contracts. This Standard provides the Joint Service discipline for the CM of defence materiel. This discipline applies to both the Contractor and the Authority to ensure effective control from concept to disposal. It is based on the requirements of NATO STANAG 4159, 'NATO Materiel Configuration Management, Policy and Procedures for Multinational Joint Projects' and NATO STANAG 4427 'Introduction of Allied Configuration Management Publications (ACMPs)'.

CM anchors the technical and operational requirements in documentation that is standard for both the Authority and its Contractors. Application of CM principles/practices enables the maintenance and consistency of a product's requirements, design, functional and physical attributes, performance and operational information.

Effective CM ensures that the internal and external interfaces and the various parts of a complete product or system remain compatible, including spares, test equipment, tools, ancillaries and support documentation.

Configuration baselines are established by defining materiel both functionally and physically by means of drawings, specifications and other relevant data and documentation. These are prepared at the level of detail necessary to satisfy project needs and are used to assess the potential effects of any proposed changes and to manage the implementation of approved changes. Materiel is constantly verified against the defined product baseline to ensure conformance.

The Authority's projects normally involve two phases of formal CM for a product, i.e. Under Contractor Control (UCC) or Under Ministry Control (UMC).

Configuration Management of Defence Materiel - Standards for Defence

1 Scope

1.1 The principles of CM shall be applied to the acquisition of defence materiel throughout all phases of the acquisition cycle. The level of application of CM should be defined in the contract and detailed in the CM Plan (CMP).

1.2 This Standard specifies generic CM requirements, which may be tailored to suit individual contract/project needs, taking into account the complexity and nature of the work.

1.3 In addition to the generic CM requirements this Standard also specifies CM requirements particular to the acquisition of Air (**Annex G**), Land (**Annex H**) and Maritime (**Annex I**) platform/equipment.

1.4 CM policy and practices shall be in place and effective from the earliest phase of a contract/project through to the archiving of records following final product disposal. This Standard has been written from the viewpoint of CM throughout the acquisition cycle. It requires that a CM policy be in place at all times but allows for any part of the implementation of that policy to be delegated by the Authority, through contract action and in a controlled manner.

2 Warning

The Ministry of Defence (MOD), like its contractors, is subject to both United Kingdom and European laws regarding Health and Safety at Work, without exemption. All Defence Standards either directly or indirectly invoke the use of processes and procedures that could be injurious to health if adequate precautions are not taken. Defence Standards or their use in no way absolves users from complying with statutory and legal requirements relating to Health and Safety at Work.

3 Related Documents

3.1 The publications listed below are related to this Standard. Publications are grouped and listed in alpha numeric order.

Designation	Title
Def Stan 00-60	Integrated Logistics Support Procedures.
Def Stan 05-10	Drawing Procedures.
Def Stan 05-61 Pt 1	Quality Assurance Procedural Requirements - Concessions.
Def Stan 05-95	Quality System Requirements for the Design, Development, Supply & Maintenance of Software.
AQAP 2110	NATO Quality Assurance Requirements for Design/Development and Production.
AQAP 2120	NATO Quality Assurance Requirements for Production.
AQAP 2130	NATO Quality Assurance Requirements for Inspection and Test.

ISO 10007 Guidelines for Configuration Management.

ISO/IEC 12207 Information Technology - Software life cycle processes.

STANAG 4159 NATO Materiel Configuration Management Policy and Procedures for Multi-National joint Programmes or Projects.

STANAG 4427 Introduction of Allied Configuration Management Publications (ACMPs 1 to 7).

3.2 Reference in this Standard to any related document in any ITT or contract means the edition and all amendments current at the date of such tender or contract unless a specific edition is indicated.

3.3 In consideration of **3.2**, users shall be fully aware of the issue and amendment status of all related documents, particularly when forming part of an ITT or contract. Responsibility for the correct application of standards rests with users.

3.4 DStan can advise regarding where related documents can be obtained. Requests for such information can be made to the DStan help desk. How to contact the help desk is shown on the outside rear cover of this Standard.

4 Definitions and Abbreviations

For the purpose of this standard the definitions and abbreviations used are shown in **Annex A**.

5 Configuration management requirements

5.1 These CM requirements are to ensure that both the Contractor and the Authority apply a compatible CM system through life.

5.2 The CM system shall:

- a) Allow visibility of the configurations of the product throughout its life cycle;
- b) Involve the principal CM activities of planning, identifying, documenting, controlling, accounting for and auditing the product configurations; the process model illustrating these activities is at **Annex B**;
- c) Provide a means for the management of change;
- d) Enable the configuration status and history to be continuously recorded and available;
- e) Control the selection of Configuration Items (CIs) that collectively define the product;
- f) Identify and record the physical and functional characteristics of the CIs;
- g) Establish, record and control product CI interfaces, both internally and externally;
- h) Take account of statutory and regulatory implications;
- i) Be fully documented.
- j) Where applicable recognise and control the unique CM requirements, defined at **Annexes G, H & I** respectively, for the acquisition of Air, Land and Maritime platforms/equipment.

6 Configuration Management and Planning

6.1 The purpose of this function is to plan and manage the CM process for the context and environment in which CM is to be performed and implemented, including provisions for the development and incorporation of improvements to the CM processes. CM planning and management over the product life cycle results in defined and effective CM functions.

6.2 The CMP shall address, but not be limited to:

- a) Purpose, scope and programme;
- b) Organisation structures, committees and responsibilities;
- c) CM contractual requirements and policies;
- d) CM systems, tools, procedures and resources, including Information Technology to be used;
- e) Functional and physical interfaces and co-ordination methodologies;
- f) CI selection and documentation;
- g) Configuration Identification and Documentation;
- h) Configuration Change Management (CCM) procedures including fast track procedures;
- i) Relationship with other plans;
- j) Change control for the CMP;
- k) CM for sub-contracted items;
- l) CM deliverables;
- m) Government Furnished Assets (GFA);
- n) Non-Developmental Items (NDI);
- o) Configuration Status Accounting (CSA);
- p) Configuration Status Record (CSR);
- q) CM Reviews and hand over from UCC to UMC;
- r) Configuration Audit (CA).

6.3 Unless otherwise specified in the contract, the CMP shall be a deliverable document, agreed with the Authority and linked to a contractual milestone. An initial CMP shall be submitted to the Authority as part of the response to ITT. Once accepted, the CMP shall form part of the contract. The CMP shall evolve throughout the life of the product and be progressively reviewed and, where necessary up-dated and re-submitted for acceptance.

6.4 The specific CM practices, resources, timing and extent of activities that are to be employed shall be addressed in the CMP. Guidance on the content of a CMP can be found at **Annex C**.

7 Configuration Identification

7.1 Configuration identification involves the identifying and documenting functional and physical characteristics of the selected Configuration Item (CI).

7.2 Criteria for selection of CIs shall include, but not be limited to:

- a) Safety;
- b) Criticality and complexity;
- c) Costs and purchasing;
- d) Functionality and performance;
- e) Integration, interchangeability and status as a replaceable item;
- f) Integrated Logistic Support (ILS);
- g) Reliability and maintainability;
- h) Organisation, management and responsibility considerations.

7.3 Each CI shall be defined in sufficient detail so that it may be selected, developed, tested, evaluated, produced, accepted, operated, maintained, supported, modified and disposed of.

7.4 Further CIs shall be identified as necessary as the contract/project progresses.

7.5 When a CI is part of a hierarchical structure, selection of subsidiaries shall be influenced by the need for control of the subsidiary CI interfaces.

7.6 Deliverable and non-deliverable software affecting the functional and physical attributes of the product shall be designated as a CI. The choice of subsidiary CIs shall be determined by the breakdown structure to sub-levels of the software system.

7.7 The functional and physical characteristics of each Configured Item shall be documented.

Configuration Identification establishes:

- A method for organising the composition of the product elements and associated information;
- Unique identification of products and product configuration information;
- Consistency between a product itself and the information about the product;
- Product attributes that are defined, documented and baselined.

7.8 A configuration identification process shall be established listing those CM documents that define each Configuration Baseline.

7.9 CM documentation and data shall cover all activities and properties pertinent to the product throughout its life cycle.

7.10 CM documentation and data defining Configuration Baselines e.g. Functional, Developmental and Product shall be mutually consistent and compatible. Each successive level of CM documentation shall be traceable to the next higher level in any hierarchical structure.

7.11 Changes to CM documents shall be separately identified and clearly indicate the areas affected. They shall be maintained, stored and protected using media and disciplines such that accurate retrieval is assured.

7.12 The CM documentation status for each CI shall be identified by means of the CSR.

8 Configuration Change Management

8.1 The CCM process shall:

- a) Identify the CCM authority at all times throughout the product life cycle;
- b) Enable decisions to be taken on proposed changes to the product;
- c) Ensure that compatibility is maintained between the product CIs themselves and those in any interfacing product or system;
- d) Establish CCM groups/committees as required;
- e) Stipulate the terms of reference for each group/committee and controls required to manage the CCM system efficiently and effectively.

9 Configuration Status Accounting

9.1 A CSA process shall be developed for all CIs and be maintained for the life cycle of the product.

9.2 CSA shall record and make available the information necessary to manage the configuration effectively and maintain traceability of the CM documentation, the status of proposed changes to the configuration and the implementation status of authorised changes. Configuration information shall be presented in the formats specified in the CMP. Procedures for CSA shall be detailed in the CMP.

9.3 CSA shall consider, but not be limited to:

- a) Identifiers;
- b) Specification, outline, control, manufacturing and interchangeability drawings / data;
- c) Design review records and certificates of design;
- d) Major deviations/production permits; waivers/concessions;
- e) Design Record;
- f) Computer software documentation;
- g) Proposed and authorised change proposal forms;
- h) Modification state.

9.4 For authorised changes to the approved configuration of a CI, the CSA process shall be capable of recognising the potential for impact on interfacing CIs and systems and be able to track the progress of any resulting changes made necessary to retain compatibility. Where software based tools are used for CM, controls shall be introduced to prevent unauthorised changes and shall be detailed in the CMP.

10 Configuration Status Record

10.1 A CSR shall:

- a) Provide a record for each CI by reference to part numbers, drawings lists and specifications of the planned, current and all earlier approved baselines including, where applicable, those of variants and those of ancillary items such as modification sets and kits, special tools, handling equipment, special to type test equipment and packaging;
- b) Provide a baseline for each CI from which to define the subsequent as-fitted and future modification states of the product throughout its service life;
- c) Record the change status of the product by providing a reference to the change record of each CI, for all authorised modifications, amendments and system changes;
- d) Provide a family tree showing the relationship of all the CIs making up the product by reference to drawings list numbers and/or an illustrated parts catalogue;
- e) Enable the contract build state for each CI to be uniquely defined for production orders;
- f) Enable the product design state to be defined in certificates of design;
- g) Include NDIs & GFA;
- h) Identify any feature in the product with safety or operational implications that may require special tests or examinations;
- i) List all deliverable CM documentation for the product as defined in the CMP; support and in-service publications; software documents and listings; quality plans; risk management plans; safety plans and interface specifications.

10.2 A CSR reference system shall be adopted such that higher level CIs can be cross referred to those of subsidiary and associated CIs, and vice versa.

10.3 The CSR for products containing CIs common to more than one product shall refer to the relevant configuration documentation maintained by the Design Authority (DA) for that common CI.

10.4 A complete product CSR shall be created to provide an overview of constituent CIs by means of a family tree to a level of detail to be agreed by the appropriate authority as defined in the contract.

10.5 The Product Baseline (PBL) CSR shall be certified for accuracy by the DA responsible for that CI, prior to approval for production and before coming UMC.

10.6 A CSR shall list all items used in support of the product, such as special tools, design tools and models, special to type test equipment, handling equipment and packaging.

10.7 A CSR shall be in a format outlined in the CMP and agreed by the appropriate authority. Commercial database packages output shall be compatible with the Authority's data import requirements as specified in the contract.

11 Configuration Audit

11.1 There are two types of CA:

- a) Functional Configuration Audit (FCA);
- b) Physical Configuration Audit (PCA).

11.2 The arrangements for each CA shall be defined in the CMP. These CAs shall be performed by audit teams at any stage during the product life cycle to provide formal verification that the CIs conform to the Configuration Baselines. An example of the CA process is given at **Annex F**.

11.3 The timing of each CA shall be determined in a cost effective manner taking into account overall contract requirements, the work schedule of the Contractor and the availability of the CI.

11.4 CA reports shall be formally presented to the appropriate authority, as defined in the contract, for acceptance and evaluation of any need for corrective action.

12 Under Contractor Control

12.1 The Contractor shall establish, document and maintain a CM system compliant with this standard for use throughout the product life cycle.

12.2 To meet these responsibilities, the Contractor shall:

- a) Produce a CMP to be agreed with the Authority;
- b) Implement progressively a CM system, up to UMC, as the definition of CIs becomes sufficiently established;
- c) Assemble, from the outset, a set of configuration documentation and data and take adequate precautions to preserve it from accidental loss or damage;
- d) Inform the Authority of any proposed change affecting contractual requirements and of any difficulties in complying with the CMP;
- e) Establish CM groups as defined in the CMP to ensure the effectiveness of the CM system;
- f) Arrange to deliver the PBL UMC in accordance with the CMP, phased as necessary for individual CIs;
- g) Bring individual CIs UMC to a programme agreed with the Authority;
- h) Make available, when required by the Authority, configuration documentation and procedures referenced in the CMP;
- i) Provide the Authority with the CSR when a CI is brought UMC;
- j) Enable interfacing with other projects, as agreed with the Authority.

12.3 Where CM requirements are outside the control of the Contractor, advice and assistance shall be sought from the Authority.

13 Under Ministry Control

13.1 The Authority shall maintain the CM system compliant with this standard. To meet this responsibility the Authority shall:

- a) Make contractual arrangements for product CM as necessary;
- b) Continue the operation and maintenance of the CMP;
- c) Receive the PBL UMC in accordance with the CMP;
- d) Appoint as necessary, CCM group with authority to ensure that satisfactory CM system standards are applied and achieved.

13.2 Product CCM applied while UMC shall:

- a) Maintain effective control of the approved configuration;
- b) Ensure that change proposals are processed in a timely manner and are justified and evaluated in terms of performance, whole life costs, support and project time scale;
- c) Apply an Implementation Classification (**Annex E**) to indicate applicability of the change, including the need for retrospective action, and the degree of urgency for embodiment;
- d) Evaluate the impact of concessions;
- e) Enable implementation of authorised changes and make use of CSA to track progress from concept through to completion.

13.3 The requirements in this Section are for the control of Amendments and Modifications, which come within the definitions at **Annex A**. Any changes, which do not meet these definitions, shall be managed in accordance with the processes defined in the CMP. Proposals for Modifications to a CI shall be submitted in an agreed format to the CCM authority (see examples of the data set requirements at **Annex D1 & D2**). The CCM authority should identify opportunities for design integration such that more than one Modification may be embodied concurrently.

13.4 Proposed changes to CIs that are installed in integrated systems shall be assessed in terms of the implications for interfacing products and the overall system concerned. Consequential changes in another product or system shall be addressed collectively to ensure continued compatibility.

13.5 When a Modification to a CI is approved, traceability shall be maintained using CSA and this shall extend to those ancillary items affected and any necessary support requirements.

13.6 The Modification instructions shall include full and comprehensive details necessary to enable the implementation of the modification.

13.7 Where the Modification is to be conducted by a contractor, prior authorisation shall be obtained before work commences. Under exceptional circumstances, with the agreement of the Authority, contingency fast track procedures may be included in the CMP.

Annex A

Definitions and Abbreviations

A.1 Definitions

The following definitions are applicable to this Standard.

Acquisition.

The process of requirement setting, procurement management, support management and termination/disposal, implying a whole-life approach to defence capability.

Acquisition Lifecycle.

The phases of a project that enable the delivery, support and disposal of military capability

Amendment.

Defined as a change to a CI, which corrects errors in design records, makes minor manufacturing changes, introduces an agreed alternative item or brings design records in line with manufacturing practices. It does not require authorisation by the Authority prior to implementation.

Audit Report.

Defined as an accurate record of an Audit. It should consist of official minutes, significant questions and answers, action items, concession details and recommended courses of action resulting from presentations or discussions.

Authority.

Defined as the Secretary of State for Defence or any person(s) duly authorised to act on his behalf or as defined in the contract.

Bought out Item.

Defined as any item that has been procured.

Change.

Defined as an alteration or modification.

Computer Software.

Defined as a combination of associated computer instructions and computer data definitions required, to enable the computer hardware to perform computational or control functions.

Computer Software Documentation.

Defined as technical data, including computer listings and printouts, in human readable form which documents the design or details of computer software, explains the capabilities of the software, or provides operating instructions for using the software to obtain desired results from a computer, including relevant maintenance/support documentation.

Concession.

Defined as formal approval by the customer to a Contractor to depart from the original specified technical requirements.

Configuration.

Defined as the functional and physical characteristics of materiel as described in its technical documentation and later achieved in the product.

Configuration Audit.

Defined as the verification of an item for compliance with its configuration documentation (also see Functional Configuration Audit & Physical Configuration Audit).

Configuration Baseline.

Defined as the configuration documentation/data formally designated and applicable at a specific point in the CI life cycle. The Configuration Baseline, plus the duly approved changes thereto, is defined in the current configuration identification. There are normally three configuration baselines in CM.

- a) Functional Baseline.
- b) Design (Development or Allocated) Baseline.
- c) Product Baseline.

Configuration Change Management.

Defined as the management of change to the formal established configuration baseline by:

- a) The systematic evaluation, co-ordination, approval/disapproval and
- b) dissemination of all proposed changes to a CI and/or its configuration documentation;
- c) Verification of the implementation of all approved changes.

Configuration Documentation.

Defined as the current, agreed technical documentation/data for a CI (the documents can be in any medium).

Configuration Identification.

Defined as the process of identifying and documenting the functional and physical characteristics of CIs.

Configuration Item.

Defined as an item designated for CM.

Configuration Management.

Defined as a management system for establishing a product's functional and physical characteristics and for maintaining consistency with its changing requirements through the life cycle. CM includes the following interrelated processes:

- a) Configuration Management and Planning
- b) Configuration Identification and Documentation.;
- c) Configuration Change Management;
- d) Configuration Status Accounting;
- e) Configuration Audit.

CM Plan.

Defined as the document that formally describes the scope of CM, the CM organisation, the CM procedures for the project/product and the responsibilities for CM.

Configuration Status Accounting.

Defined as the process for creating and organising the data necessary for the performance of cm. The process enables the capture, storage of, and access to, configuration information needed to manage products and product information effectively. The CSR is the configuration database within the CSA. The outputs of the CSA process are configuration information, status and performance measurement, and should be in the formats specified in the CMP.

Configuration Status Record.

Defined as the record produced by the CSA process. It is the source database of configuration information to support through life programme activities including programme management, system engineering, manufacturing, software development, logistic support, maintenance and modification. The CSR should describe the status of the CI at any stage in its life cycle, including where appropriate, the current version of each CI.

Data.

Defined as recorded information, regardless of form or characteristics.

Design Authority.

An organisation appointed by contract to be responsible for a design or modification of a design, and for signing the Certificate of Design. The authority for acceptance of a design and any change to that design remains with the MOD IPTL.

Design Baseline.

Defined as the configuration documentation formally designated at the end of the Assessment and before Demonstration (**Fig 2**). The Design Baseline includes:

- a) Functional and physical characteristics that are allocated from the functional baseline for CIs;
- b) Test requirements demonstrating achievement of functional characteristics;
- c) Interface characteristics with associated CIs;
- d) Design constraints.

Design Record.

Defined as all information necessary to define the design, manufacture, packaging, testing, installation, and servicing of a product.

Design Review.

Defined as a formal, documented engineering management process that is used to subject a design to a systematic critical study. Its purpose is to establish that the design satisfies the specified requirement.

Deviations

Now an obsolete term – refer to Concession. (Defined as written agreement by the customer to a Contractor to depart from the original specified technical requirements prior to production).

Embodiment.

Defined as the process of physically implementing a Modification to the product.

Functional Baseline.

Defined as the configuration documentation, formally designated during Assessment (**Figure 2**), prescribing:

- a) Functional characteristics;
- b) Test requirements;
- c) interface characteristics with associated CIs;
- d) Key lower-level CIs, if any;
- e) Design constraints.

Functional Characteristics.

Defined as the designed scope (i.e. sequence and essential qualities) of the operations to be performed by an item. Functional characteristics are expressed in terms of quantitative performance parameters such as range, speed, lethality, reliability, maintainability, safety; and operating and logistics parameters and their respective tolerances.

Functional Configuration Audit.

Defined as the formal examination of test data and quality assurance records for a CI, prior to acceptance of the PBL, to verify that the CI has achieved the performance and functional characteristics specified in its configuration documentation

Implementation.

Defined as the incorporation of an approved change in accordance with documented direction approved by the appropriate level of authority

Interface.

Defined as the specifically defined physical or functional juncture between two or more CIs.

Interface Control.

Defined as the procedures and documentation, necessary for the identification and management of functional and physical characteristics between two or more systems or CIs.

Item of Production.

Defined as an item that is not yet in the NATO Inventory

Item of Supply.

Defined as an item in the NATO Inventory.

Life Cycle.

Defined as the generic term covering all phases throughout the life of an item or a product from concept to disposal.

Materiel.

Defined as the generic term covering system, equipment, stores, supplies and spares including related documentation manuals, computer software, firmware and services.

Modification.

Defined as a change to a CI after the formal establishment of the configuration baseline.

Modification Proposal.

Defined as the formal documentation that provides engineering information and other data in sufficient detail to support the requirement for the change to a CI and its configuration documentation.

Modification Sets.

Defined as components supplied by a Contractor for the embodiment of a modification, and may include:

- a) Items manufactured by the Contractor;
- b) Items purchased by the Contractor from other suppliers, provided that they are not available from Service Stock;
- c) GFA issued on to the Contractor for inclusion in the modification set.

Modification Kits.

Defined as equipment assembled by Service stores for issue to Units embodying the modification and may include:

- a) Modification set or sets;
- b) Other items drawn from current Service stock i.e. Item of Supply;
- c) contractor supply items that are not purchased in the form of modification set i.e. Bought Out Items (BOI).

Non Developmental Item.

Defined as a procured or procurable item that is or should be available in the commercial market place requiring no modification or only minor adaptation to meet the requirements of the Authority.

NATO Stock Number.

Defined as a 13-digit numeric data string, which on its own uniquely identifies an Item of Supply in the NATO inventory.

Part Number.

Defined as a set of numbers, letters, symbols or some combination thereof, assigned by a manufacturer to identify uniquely the design of a specific part or item of materiel in his own inventory.

Physical Characteristics.

Defined as quantitative and qualitative expressions of material features, such as composition, dimensions, finishes, form, fit, and their respective tolerances.

Physical Configuration Audit.

Defined as the formal examination of the "as-built" configuration of a CI to verify that it conforms to its product configuration documentation.

Product Baseline.

Defined as the configuration documentation for a CI formally designated at the beginning of its production prescribing (see C.1.3):

- a) All necessary physical and functional characteristics of CIs;
- b) The selected functional characteristics designated for production acceptance testing.
- c) The production acceptance tests.

Production Permits.

Now an obsolete term – refer to Concession. (Defined as written agreement by the customer to a Contractor to depart from the original specified technical requirements prior to production).

Project Needs.

Defined as a general term used for the life cycle requirements and considerations given to the development, production, operation, support and disposal of a CI. Project needs include, but are not limited to quality assurance, reliability, maintainability, produceability, test and evaluation, acceptance, approval for production, ILS, personnel, training, availability, interoperability, interchangeability, transportability, survivability, nuclear, biological and chemical hardening, operational readiness, security, safety, schedules, competitive re-procurement, and total life cycle costs.

Proof Installation.

Defined as a formal demonstration that a modification can be embodied, operated and/or tested retrospectively, without amendment, utilising the modification instructions (a modification set from the 1st production batch is normally used).

Requirements Baseline.

Defined as a documented common understanding of what the product is expected to do (its functional and performance requirements). It defines the capabilities the customer expects to receive from the product.

Service Modification.

Defined as a modification designed, approved, and manufactured within the in-service organisations. Service modifications are of an urgent, simple or special nature.

Specification.

Defined as a document that explicitly states the essential technical attributes/requirements for a product and procedures to determine that the product performance meets its attributes/requirements.

Support Equipment.

Defined as the equipment required to maintain an item, system, or facility in its operational status, including related computer programs

System.

Defined as a composite of subsystems, assemblies (or sets), skills, and techniques capable of performing and/or supporting an operational or non-operational role. A complete system includes related facilities, items, materiel, services and personnel required for its operation to the degree that it can be considered a self-sufficient item in its intended operational or non-operational and/or support environment.

Tailored.

Defined as the process by which specific requirements of specifications, standards, and related documents are modified to ensure that each tailored document invoked states only the minimum needs of the particular project.

Technical Data.

Defined as the recorded information, regardless of form or characteristics, of a technical nature. Technical data may document research, developmental or engineering work or be used to define a design or process or to procure, support, maintain, or operate materiel. The data may be graphic or pictorial delineation in media such as drawings or photographs, text in specifications or related performance or design type documents, or computer printouts. Technical data does not include computer software.

Technical Instructions.

Defined as those instructions, which are issued to rectify faults that impair the safety, serviceability or operational efficiency of equipment in service.

Trial Installation.

Defined as the physical and/or functional proof of the proposed design change.

Validation.

The process of determining that the design complies with the specified requirement.

Verification.

The process of determining that the products of a given design & development phase are correct and consistent with respect to the products and standards provided as inputs to that phase.

Version.

Defined as an identified and documented instance of a CI that is identified and documented. Any modification to a CI of a software or hardware product, resulting in a new version, requires configuration management action.

Waivers

Now an obsolete term – refer to Concession. (Defined as written agreement by the customer to a Contractor to depart from the original specified technical requirements prior to production).

A.2 Abbreviations

The following abbreviations are used in this Standard:

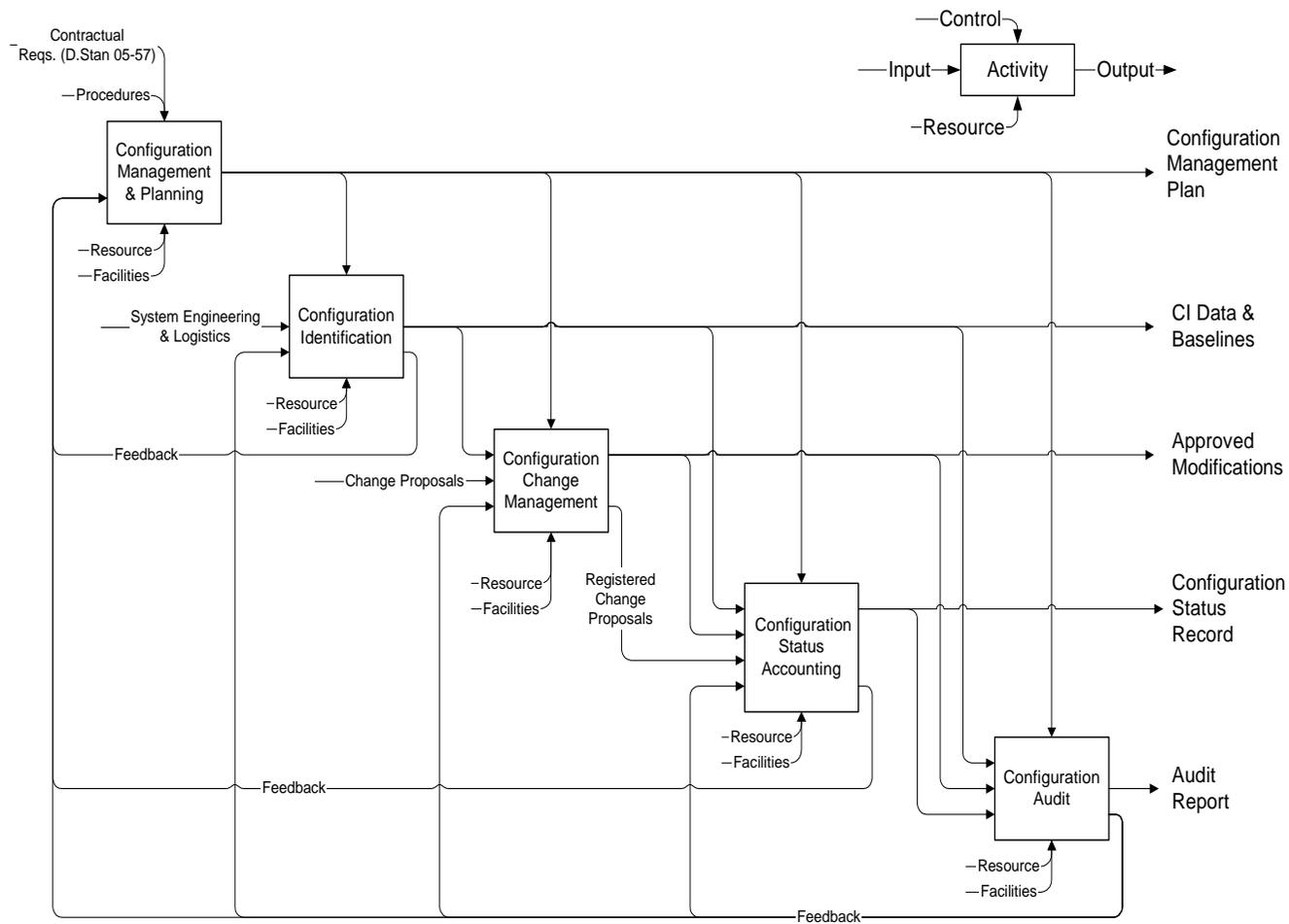
Abbreviation	Meaning
ACMP	Allied Configuration Management Publication
AMS	Acquisition Management System
BOI	Bought Out Item
CA	Configuration Audit
CAD	Computer Aided Design
CAM	Computer Aided Manufacture
CCM	Configuration Change Management
CI(s)	Configuration Item(s)
CITIS	Contractor Integrated Technical Information Service
CM	Configuration Management
CMP	Configuration Management Plan
CMWG	Configuration Management Working Group
CSA	Configuration Status Accounting
CSCI	Computer Software Configuration Item
CSR	Configuration Status Record
CWP	Contractors Working Party
DA	Design Authority
Def. Stan	Defence Standard
DMSC	Defence Materiel Standardization Committee
DR	Design Review
DStan	UK Defence Standardization
EDI	Electronic Data Interchange
EOD	Explosive Ordnance Device
FBL	Functional Baseline
FCA	Functional Configuration Audit
GFA	Government Furnished Assets
HMI	Human Machine Interface
ICY	Interchangeability
ILS	Integrated Logistic Support
ILSP	Integrated Logistic Support Plan
IPT	Integrated Project Team
IPTL	Integrated Project Team Leader
ITT	Invitation To Tender
LSA	Logistic Support Analysis
MOD	Ministry of Defence
MPF	Modification Proposal Form
MRI	Master Record Index now superseded, the CSR contains the functionality of the MRI
MSML	Minimum Standard Modification List
MSPL	Modification Spares Provisioning List
NATO	North Atlantic Treaty Organization
NCP	No Contractor Parts
NDI	Non-developmental Item
NES	Naval Engineering Standard
NSN	NATO Stock Number
PBL	Product Baseline
PCA	Physical Configuration Audit
PI	Proof Installation
QAA	Quality Assurance Authority
RBD	Retrofit embodiment Before Delivery
RBL	Requirements BaselineSDR System Design Review
SRD	System Requirements Document
SLP	Spares Latest Pattern

SOO	Special Order Only
SRR	System Requirements Review
SSP	Sea System Publication
STANAG	Standardisation Agreement (NATO)
TI/PI	Trial Installation/Proof Installation
UCC	Under Contractor Control
UK	United Kingdom
UKNCB	UK National Codification Bureau
UMC	Under Ministry Control

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Annex B

Figure 1 — Configuration Management Process



DRAFT
Unclassified

DRAFT

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Annex C

Configuration Management Plan

C.1 General Requirements

C.1.1 This Annex provides criteria for the development of the CMP throughout the acquisition cycle.

C.1.2 An outline CMP is normally initiated by the Contractor as part of the tendering process and is subsequently updated to cover both hardware and software components of the product while UCC. When the product comes UMC, the CMP is maintained to the Authority's satisfaction using contractual arrangements as required.

C.1.3 The AMS life cycle model with illustrative CMP update events is shown below:

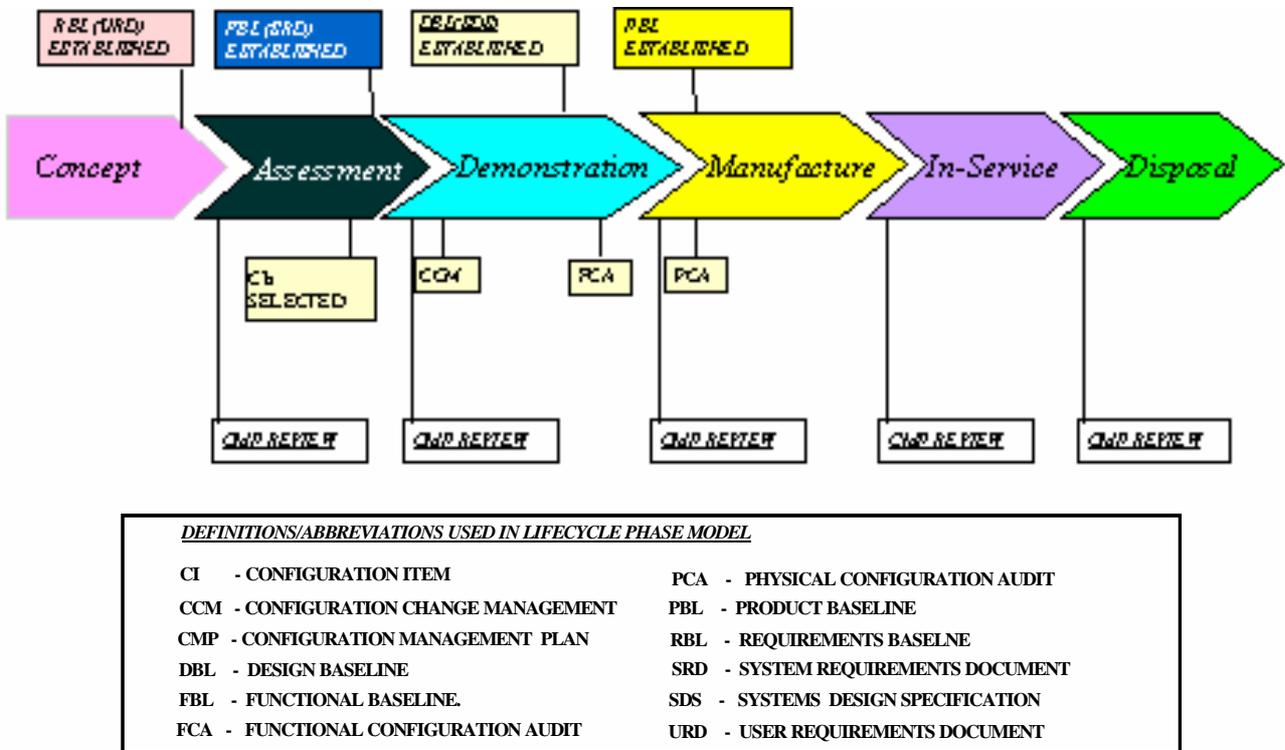


Fig 2: Typical Acquisition Cycle - Configuration Management Model

C.1.4 The CMP should define and document how CM System requirements should be met for a particular product. It should include, but need not be limited to, the content set out under clauses C.2 to C.14 below.

C.2 Purpose and Scope

C.2.1 This section should include:

- a) The purpose and scope of the CMP together with the extent of CM to be applied to the activities associated with the product and project;
- b) An overview of the key contents and structure of the CMP;
- c) A list of definitions, a glossary of terms and a list of acronyms relevant to the CMP;
- d) Those reference specifications, standards, manuals and other documents applicable to the CM of the product. Each document should be completely identified by title, document number, issuing authority and date of issue;
- e) Security instructions that are specific for CM or the CMP or any additional to those contained in the project Security Management Plan;
- f) Instructions for management of CM documents, including the CMP, with the means and methods of review, change controls and authorities, approved signatories, publication and issue;
- g) Special features of the materiel or the project programme which have a bearing on CM.

C.3 Programme

C.3.1 This section should provide:

- a) A list of CM milestones taken from the project management planning database;
- b) A detailed plan for the hand over of individual CIs from UCC to UMC.

C.4 Organisation

C.4.1 This section should identify:

- a) Policies and directives relating to CM;
- b) Responsibilities and authority for CM of all participating groups and organisations;
- c) Relationships among the product organisations including the Authority, Contractor, sub-contractors, design authority, suppliers and customers in the provision of CM;
- d) Identification of the CCM authority, and the change process, at all times throughout the product life cycle.

C.5 Contract

C.5.1 This section should identify:

- a) The contractual CM requirements and the role of the CMP as part of these requirements, including any specific controls to ensure compliance with the additional requirements for Air, Land or Maritime systems;
- b) The means for reporting difficulties in complying with CM contract requirements and those of the CMP;
- c) The arrangements for achieving CM system requirements when sub-contracts are employed.

C.6 Resources

C.6.1 This section should provide explanatory information on :

- a) CIs in both the system design and development environment such as computer aided design programs, and in the manufacturing phase such as special jigs, tools and test equipment;
- b) Those facilities such as, technical data models, databases and information systems with indirect implication for the product CM.

C.6.2 The Curriculum Vitae and job profile of CM experience for CM manager(s).

C.7 Interface Management

C.7.1 This section should include:

- a) The arrangements for use of NDI and GFA;
- b) Details of other projects and products affected by changes to the product CIs and arrangements for co-ordination and the exchange of information;
- c) Methodologies to be adopted for the identification, control and documenting of product external interfaces;
- d) Relationships with databases for co-ordinating CM between products and equipment at the platform or system level;
- e) Arrangements for co-ordination with other project requirements e.g. Standardisation, Codification, and LSA.

C.8 Selection of CIs

C.8.1 This section should contain sufficient information to meet the requirements of **Clause 7** and should outline the baseline generation procedures.

C.9 Configuration Change Management

C.9.1 This section should fulfil the requirements of **Clause 8** and should present plans for:

- a) Implementing a CCM process that provides total visibility for the management of change through the product life cycle;

- b) Processing and submitting change proposals to an approved format to the Authority;
- c) Processing and submitting concessions to the Authority;
- d) Promulgating decisions concerning change proposals and concessions;
- e) Ensuring that the implementation of approved changes is reflected in the CSR;
- f) Establishing a fast track processing procedure for change proposals when directed by the Authority;
- g) Implementing a system for change priorities referenced to the Modification Classification System;
- h) Dealing with change proposals falling outside the definitions of Amendment and Modification.

C.10 Configuration Status Accounting

C.10.1 This section should satisfy the requirements of **Clause 9** and should contain processes for collecting, recording, processing and maintaining all configuration documentation and data necessary for the creation and maintenance of the CSR including:

- a) Formats and data elements for all configuration documentation including software;
- b) Specification, outline, control and manufacturing drawings;
- c) Design review records and certificates of design;
- d) Concessions;
- e) Computer software documentation;
- f) Proposed and authorised change proposals;
- g) Correlation of change proposals on interfacing CIs;
- h) Formal review periodicity and the means for being viewed remotely by all Authority's members.

C.11 Configuration Audits

C.11.1 This section should satisfy the requirements of **Clause 11** and should include:

- a) Procedures for carrying out the FCA and the PCA;
- b) Format for the reporting results of the FCA and PCA;
- c) Schedules for the conduct of the CAs including the relevant design reviews up to hand over to UMC.

Note: An example of the CA Audit process is given at **Annex F**.

C.12 Data Management

C.12.1 The section for data management, which is an essential part of CM should cover:

- a) Description of all data media;
- b) How the management of data should be controlled and verified throughout the product life cycle;

- c) Access/limitation to data and prevention of data corruption;
- d) Means for the distribution and presentation of data;
- e) Data ownership at the working and organisational levels;
- f) Technical publications, and user data;
- g) Data storage details including data preservation.

C.13 Training

C.13.1 CM training and guidance as required by contract.

Annex D1

Example Modification Proposal Form (MPF)

<u>1. CONTRACTOR/DESIGN AUTHORITY</u>	<u>2. MAIN EQUIPMENT</u> <u>SPEC. NUMBER</u>	<u>3. MODIFICATION NUMBER</u> <u>ISSUE NUMBER</u>
<u>4. ORIGIN</u>	<u>5. AUTHORITY IPT</u>	<u>6. EQUIPMENT GROUP CODE</u>
<u>7. TITLE</u> Description Title		
<u>8. EFFECT ON: PROJECT/MODIFICATION(S)</u> a) Before & concurrent changes: b) Benefits to customer (MOD):	<u>9. EFFECT ON: OTHER CONTRACTORS</u>	
<u>10. ESTIMATED DATE OF EMBODIMENT</u> a) TI/PI b) Production c) Repair & Reconditioning d) Conversion	<u>11. DELAY IN PRODUCTION/ CONVERSION</u>	
<u>12. DELIVERY OF MODIFICATION SETS:</u> Date: _____ Rate of: _____		
<u>13. MAN-HOURS FOR SERVICE EMBODIMENT</u> a) Access b) Strip c) Embody d) Re-assembly e) Test f) Total		
<u>14. CONTRACTORS RECOMMENDATION</u> Preparation, Trial Installation or Production work cannot commence on the basis of recommendation.		
Contractor/Design Authority Signature: _____		Date: _____
<u>15. INTEGRATED PROJECT TEAM (IPT)</u> Meeting Number: _____ Date: _____ Item: _____ Previous Item: _____ Meeting Number: _____ Date: _____ Item: _____ Previous Item: _____	<u>16. APPLICABLE CONTRACTS</u> Preparation & Trial Installation Manufacture Of Modification Sets Design Incorporation Embodiment By CWP	

MODIFICATION NUMBER	ISSUE NUMBER
<p>18. MODIFICATION PROPOSAL PRICE / COSTS</p> <p>a) DESIGN PREPARATION and DEVELOPMENT TRIALS</p> <p>i) Preparation £</p> <p>ii) Bench Tests £</p> <p>iii) Trial Installation (PCA) £</p> <p>iv) Static Trials £</p> <p>v) Mobile Trials £</p> <p style="text-align: right;"><u>TOTAL</u> £</p> <p>NB Preparation/Trials costs may be authorised prior to classification of Modification</p> <p>b) EMBODIMENT / MANUFACTURE</p> <p>i) In Production £</p> <p>ii) Evaluation (GW) £</p> <p>iii) Retrospective Before: Delivery Production £</p> <p>iv) Repair & Reconditioning £</p> <p>v) Return to Works £</p> <p>vi) Scrap £</p> <p>vii) Tools for Service – Embodiment £</p> <p>viii) Inspection Media £</p> <p>ix) Test Equipment £</p> <p>x) Production Equipment £</p> <p>xi) Modification Set £</p> <p>xii) Manufacturing Tooling £</p> <p>xiii) Packaging £</p> <p style="text-align: right;"><u>TOTAL</u> £</p> <p>c) DESIGN INCORPORATION</p> <p>i) Up-date Configuration Documentation £</p> <p>ii) Up-date Configuration Status Record £</p> <p>iii) Technical Publication Amendments £</p> <p>iv) Modification Leaflet £</p> <p style="text-align: right;"><u>TOTAL</u> £</p>	<p>19. ADDITIONAL INFORMATION (As required)</p>
	<p>20. AUTHORITY IPT DECISION This decision is the authority to proceed with the work, subject to classification & approval by the 'Authorised Signatories' (Block 21).</p> <p>MODIFICATION CLASSIFICATION:</p>
	<p>21. MODIFICATION APPROVAL</p> <p>Authority:</p> <p>Signature: _____ Date: _____</p> <p>Approved Contractor/Design Authority:</p> <p>Signature: _____ Date: _____</p>

Annex D2

Information for Completion of Example Modification Proposal Form

D2.1. The Modification Proposal Form (MPF) has been designed to provide a generic means of proposing modifications when applying the requirements of this Standard. The form can be tailored to meet the specific requirements of the product life cycle. The agreed format and information required is to be configured and identified in the CMP. The following information is given to assist in completing the MPF (reference is made to each box of the Modification proposal Form). Where it is inappropriate to complete a box, a diagonal line is to be inserted.

BOX 1: The name and address of the Design Authority (DA) or Contractor (if not the DA) should be specified. In the latter case the name and address of the DA should also be provided.

BOX 2: The name of the main equipment (including project) should be specified e.g. Nimrod, Astute, FOAS, Radar Type 31 etc. The type or mark or model number, if applicable, and the part number and NATO stock number should also be given including the 'platform' specification.

BOX 3: A modification number (Notes 1) should be entered. For certain equipment the Authority may allocate a separate modification number and this should be inserted in the upper half of the box and the DA's modification number in the lower half, in brackets. In the case of a resubmission, the issue number of the MPF should be inserted below the modification number. Notes: Modification numbers should be used in a numerical sequence from a batch provided by the Authority or the Authority may accept Contractors designated numbers. The allocated modification numbers should be used in relevant correspondence. The Contractor should maintain a list of all modification numbers within the CSR.

BOX 4: The origin of the modification should be taken from the list provided below (paragraph 2). If a specification for the modification has been prepared its identity should be given and it would require an explanation with respect to the 'origin'.

BOX 5: The name of the Authority and the user Service(s) concerned should be given.

BOX 6: The modification group type (A/AB/B), if appropriate, into which the modification meets should be entered and explanation given. The modification groups are defined as GROUP A MODIFICATIONS - do not affect the interchangeability of the item with the equipment and do not require any embodiment on the main equipment by the Service unless annotated 'on replacement'. GROUP B MODIFICATIONS – are such that they justify a change of mark or type number of the equipment due to the change affecting the Physical Interchangeability or a Functional change warrants it. The main equipment would require 'cover' modification action. GROUP AB MODIFICATIONS s when the equipment do not affect the physical interchangeability, but the functional change, although not warranting a change of type or mark number, gives an improvement such that early replacement by the Service(s) is justified, and it is essential to be able to identify the modified item by modification plate action or allocation of a new part number.

BOX 7: The name of the major assembly affected by the modification should be inserted, together with its part number and NATO stock number. The quantities of such assemblies in the main equipment defined in Box 2 should be stated. The name of the CI (if not the major assembly) which is to be modified should be entered, giving brief details of the modification, e.g. "Initiator (Part No 74863), plating of switch contacts". The number and identification of such items per major assembly where applicable should be stated. If a new item is to be introduced, state whether it is instead of or by conversion of an existing item. If an existing item is to be altered, the pre-modification and post-modification part numbers should be stated and NATO stock number given; if not known at the time of submission a space should be left for their insertion. When a submission is made to cover a Service, the service modification number should be included, in brackets, at the end of the title and description.

BOX 8: This box should contain the number(s) of any other modifications(s) that are to be embodied beforehand or at the same time in the same or associated equipment and without which the modification could not be embodied or would not function correctly. If it is economical or convenient to embody other modifications concurrently, this should be stated in Box 19 "Additional Information", together with details of the estimated man-hours/cost saving. Also, the advantages or benefits to the customer should be stated in Box 19.

BOX 9: The names and locations of all other contractors to be affected by the modification, and also the title of the other materiel (items) affected (when known) should be given (see also Box 18). Insert "None" if there are no other contractors affected.

BOX 10: Give an estimate of the earliest embodiment point (i.e. date and/or item or batch or equipment number) when the modification can be embodied in the normal manufacturing sequence without delaying output. For repair, reconditioning and/or conversion date only is required. When a modification cannot be embodied in any item of the production line enter "NIP" (not in production). If it is possible to embody the modification earlier than quoted embodiment point, then the delay in production and/or extra costs should be detailed in Box 19 "Additional Information". For modifications that recommend C and D classifications, the date of embodiment is only acceptable, except when retrospective embodiment by the Service(s) is required.

BOX 11: It should be stated if an embodiment is likely to cause any delay in delivery off the production line or a major conversion program.

BOX 12: State the earliest date and the rate of delivery of modification sets by the DA. Normally the Services would supply all items that have a Service reference number and those which are common supply items. Details of such items should be given (see Box 17) for Services provisioning purposes to ensure that such items are available at the same time as the modification set. It also gives the Services the opportunity of requesting the DA to include such items in the modification set to be supplied. Note: Where appropriate, a time allowance should be made for the satisfactory completion of a proof installation.

BOX 13: The estimated man hours for Service embodiment should normally be given as five separate times and a total; when it is not practicable to separate these times an overall time only should be given. Normally it should be assumed that the times would be the same for Service embodiment as for Contractor embodiment but if, due to special circumstances, these times are likely to vary widely attention should be called to this fact by quoting both sets of times.

BOX 14: The Contractor should recommend the cost-effective method of implementation by using the 'classification' categories found in **Annex E**.

BOX 15: The IPT affected should insert the relevant data in which the MPF was reviewed /authorised.

BOX 16: Should be completed by the IPT Authority.

BOX 17: A "yes" or "no" answer is required to the "features affected". When the answer is "yes" the relevant detail information should be available to demonstrate the affects on each feature when requested by the IPT for his consideration. The features being affected may have implications on the product/equipment. The relevant information is to be supplied to the IPT on each modification(s) - attached with the appropriate MPF information such as, test results, reports, certification, proofs, requirements, approvals, data, records, procedures, methods, minutes, conditions, etc.

Note: Further guidance on Air, Land and Maritime particular requirements can be found in **Annex G, H and I** respectively.

BOX 17.01: State whether the modification affects physical or functional interchangeability The physical interchangeability is considered to be affected when the item cannot be installed in the next higher assembly without a modification to the attached structure/fittings and the related MPF should stated the particular equipment/part and a new identification (part) number given. However, to avoid the expense of producing new drawings for small content design changes, Contractors/DAs may suffix the existing part number, which would be followed by the allocation of a new Service reference number.

BOX 17.02: Reliability & Maintainability: State whether the modification affects the reliability of the equipment/assembly to which it is to be fitted. Spares: State whether detailed parts listed as service spares for the item in question are made non-interchangeable by the modification. This aspect should not be confused with the effect of the modification on the interchangeability of the item in question that is covered in box 17.01. MSML Schedule: State if the modification affects the spare schedule. Storage: State if storage requirements are affected by the modification. Training: State if there is a requirement for new training for the modification implementation and subsequent support activities. Support equipment: State if the modification affects support equipment except that needed to support prime equipment software. Packaging: State if there is any change to the packaging requirements. Technical publications: State if the Service(s) technical publications are affected by the modification. If there is an impact on the extant NSNs with respect to this modification, then the item would need to be given a new NSN. This codification process is conducted by UKNCB. This activity should be in concert with Box 02.d.

BOX 17.03: State if any of the equipment interfaces are affected by this modification.

BOX 17.04: State the category of compatibility affected by material, explosives, chemicals, electromagnetic, nuclear, etc. State if the modification would require additional EMC testing prior to implementation. Also, state if the modification affects interfacing external compatibility, e.g. aircraft, main equipment. The name and location of the Contractor/DA affected should be entered in box 9.

BOX 17.05: The change in mass should be stated for equipment and installed equipment unless there is a significant moment change any mass change less than 0.5 kg should be shown as "no". The change in C of G or moment should be entered where applicable, e.g. where the change of mass or a change in physical location due to the modification has an effect on the equipment moment or the C of G of a guided missile.

BOX 17.06: State if the airworthiness is affected. State if structural integrity is affected. Structural and hull integrity are affected by any modification which directly or indirectly alters the static strength, fatigue life or corrosion resistance of the primary structure. If the answer is "yes" a copy of the modification proposal is to be referred by the IPT to the appropriate Structural/hull integrity Meeting. State if the modification to the vehicle installed or associated equipment, affects the safety of any of the vehicle's nuclear systems. A full explanation is to be provided in box 19 "Additional Information". State if the modification to the vehicle installed or associated equipment, affects the safety of any of the vehicle's weapons systems. A full explanation is to be provided in box 19 "Additional Information". State if the modification affects any nuclear weapon control system, Nuclear weapon suspension and release, Vibration characteristics and airflow around the weapon. When a modification affects the nuclear weapon system, it should be referred to IPT for approval of the safety aspects. The "features affected" box is to be marked "Yes" and the IPT approval reference is to be included in box 19 "Additional Information".

BOX 17.07: State if the modification affects handling/performance or operational requirements. A "yes" answer would lead to consideration by the IPT of the need for testing to assess the Safety case implications.

BOX 17.08: State if the electrical pulse characteristics are affected by the modification. State whether the modification affects the Fuse and Circuit Breaker Chart carried in the vehicle. State whether the modification results in changes to the electrical power requirements for the equipment being modified.

BOX 17.09: State whether the modification affects the HMI equipment integration.

BOX 17.10: State those items that are to be supplied to the Contractor from Authority sources for inclusion in the modification set.

BOX 17.11: State those items that are to be supplied from the Service in addition to the modification sets supplied from the Contractor OR the items to be supplied by the Service for a 'No Contractor Parts' (NCP) modification.

BOX 17.12: The creation of a list of material for NCP modification. To be compiled in Box 19.

BOX 17.13: State if Service held first to fourth line software test gear programs or hardware is affected.

BOX 17.14: State if nuclear hardening is affected by the modification.

BOX 17.15: State if any required documentation is affected by the modification, such as, Specification(s) - state if any of the products specifications are impacted by this modification; Certificate of Design - state if a new certificate of design is required as a result of the modification (if "yes" record details in Box 19 "Additional Information"); Trials Documentation - state if any of the products trial documentation may be affected by this modification; Approval submission documentation; EOD Procedures; Release to Service - state if the current release to service documentation is affected by this change (if yes, this may result in further clearance work for the product); Repair procedures - state if the standard on repair procedures is affected by the modification and Minimum Standard Modification List (MSML) - state if the MSML is affected by this modification. The recommended modification classification should address any products that are being utilised for clearance trials

BOX 17.16: State the strike number to be recorded on the modification plate, if applicable.

BOX 17.17: State whether Tempest clearance is affected by the modification. (If unsure, insert "Not known").

BOX 17.18: State if the modification affects the performance of the product.

BOX 17.19: State if the modification affects the Environment control System of the product.

BOX 17.20: State if the modification affects the Vulnerability of the product.

BOX 17.21: State if the modification affects the life of the product.

BOX 17.22: State if the modification affects the Quality Assurance requirements of the product.

BOX 17.23: State if any further trials are required to qualify/re-qualify the product prior to modification implementation. Specify in Box 18

BOX 17.24: State if there is an affect on the ability to discriminate between objects or actions.

BOX 17.25: State if there is any impact on the production line. This would be further addressed in the pricing data Box 18.

BOX 17.26: State if there is any impact on current Depot/Site capabilities/facilities in respect to modification implementation.

BOX 17.27: State if there is a requirement for the modification to be subjected to test or/and mock-up or/and Trial Installation/ Proof Installation activities. These require defining.

BOX 17.28: State if any of the test equipment requirements in respect to specification, automatic test, special to type, software are affected by this modification. These should be described within box 19.

BOX 17.29: State the effect on all tooling that is used for development/testing/production/support. Prices for modifying should be provide in box 18 Price.

BOX 17.30: State if the modification has an affect on the Magnetic Signature of the product.

BOX 17.31: State if the modification has an affect on the Acoustic Signature of the product

BOX 17.32: State if the modification has an affect on the availability of the product.

BOX 17.33: State if the modification has an affect on the Portability of the product.

BOX 17.34: State if the special reference equipment would be affected in respect to calibration etc.

BOX 17.35: State if the parent platform would be affected by this modification.

BOX 17.36: State whether any simulators are affected by the modification.

BOX 18: The basis of the price quoted should be stated. When the basis for the price varies at different stages of a modification, the variation should be shown against the price to which it relates. The prices should include all cost elements including profit but excluding Value Added Tax.

BOX 18a: This records the price of each stage of a modification proposal, which is dealt with by the appropriate committee. If any stage is not required the words "not required" are to be inserted. The MPF would only be accepted as a contractual document when the relevant contract number is shown. Multiple contracts should be covered using sequential MPF's e.g. PDS for "modification preparation" resulting in a "special task" contract for design continuation, the contract number should be quoted for the appropriate stage of the proposed submission. Details of any costs incurred in preparing the MPF for submission should be shown under "Preparation" and identified as having already been incurred. Where a Trial Installation (TI) is carried out by a Contractor's Working Party (CWP), the cost of travel, accommodation, etc. should not be included. When preparation or trial installation has been authorised and a subsequent MPF is being submitted, "Authorised £----", should be shown against the stages concerned. Where test trials are required the number of hours/miles usage should be stated in Box 19 "Additional Information". Structural tests should be included in this box under ground/bench tests.

BOX 18 b & c: The price in production/embodiment is the difference in price between producing the unmodified item and the modified item. If the modification causes fewer rejects and other savings these should be reflected in the price. It should be stated whether the figures shown are an increase or decrease, and whether they are per item or product or equipment set. When a modification affects a part of an assembly, both the part and assembly are provisioned as spares, then the price for both embodiment should be given separately. The Retrospective Before Delivery Production is the price of introducing the modification into the products that have already been completed or partly manufactured but has not yet been delivered. The estimate should include the price of rework including stripping and re-testing.

It should not include the price of re-testing sub-assemblies not affected by the modification and which have already passed final test prior to the retrospective work on the other assemblies. The price quoted should be the sum of these individual prices excluding the price of modification sets. The numbers of equipment involved should also be state. The Repair and Reconditioning is the labour price necessary to embody the modification, if so classified, into each product returned for repair or reconditioning. When estimating is difficult, the price, exclusive of any stripping and reassemble, should be stated, and so annotated.

The price of embodying Class A and B modifications should include the price of additional stripping. The price of embodying Class C modifications should be for embodiment only. Where items are to be modified by return to the DA's works, the price quoted for each equipment should include Labour (actual work on the items detailed for return (including stripping, re-assembly, testing and additional items) enabling the return to the Service of the modified items); Tooling (the price of new tools and special tools/equipment including production test equipment and quality assurance measuring or checking equipment, new equipment); and/or modifications to existing tools required for production of the modification parts or modification set or to facilitate embodiment of the modification by the DA in production or retrospectively, should be shown separately under this heading); Scrap (Scrap prices incurred on items being purchased from another DA that has its own modification committee should not be quoted as this would be covered by that DA's companion modification, only the estimated price of any tooling and/or special factory test equipment that becomes redundant as a result of the modification, nor scrap arising from spares and maintenance); In-Production (the in production scrap prices quoted should be the total price of scrap arising on new production only and includes all parts manufactured or partially manufactured plus materials/items procured for incorporation in new production, that are rendered surplus by the modification in relation to the stated embodiment point) and RBD (Retrospective Before Delivery) (the RBD redundancies price quoted should be the total price of all parts manufactured and rendered redundant by retrospective embodiment of the modification); Maximum scrap price (this is an alternative to scrap (RBD) and scrap in production when required by the modification committee. It is the estimated price of any materials that become redundant plus the price of any work that has been done on such materials as a result of embodying the modification at a stated embodiment point. The maximum scrap estimate should not be exceeded without prior sanction of the appropriate modification committee). Special Tools For Service Embodiment is the price of special tools for Service embodiment which is to be kept separate from the price of the modification set, as such tools would be supplied on a different scaling. A list of such tools, including nomenclature and part numbers, should be given in Box 19 "Additional Information". Modification Set is the price of the modification set excluding embodiment

loan items. Design Incorporation is the price of design incorporation excluding technical publication prices. Modification Leaflet is the individual total prices of the modification leaflet (ML) and should be inserted. Technical Publications is the price of the technical publications. A breakdown of the price showing each publication affected, the associated price and respective publication authority should be included in Box 19 "Additional Information".

BOX 19: Any additional information pertinent to the modification in particular, where relevant is to be provided, including supplementary information called for in Boxes 8 and 9 and listing called for in Box 17 requirements as required. Where the DA is not the main equipment DA and a modification affects the 'safety case' (Box 06)(e.g. when changes alter primary structural strength or services such as controls, electrical, hydraulic or other systems) the main equipment DA should be consulted. State that the modification has been referred to the main equipment DA and the approval reference.

BOX 20: Should be completed by the relevant IPT. The following standard statements may be included, as appropriate. Recommendation - Production work cannot proceed on a "recommendation". Decision - "This is the authority for work to proceed on this modification (subject to the agreement of a fair and reasonable price by both parties - the price must be agreed first) in accordance with the following decision". Note 1: the Decision would include the modification classification (**Annex E**). Note 2: the recommendation may include a recommended modification classification.

BOX 21: The MPF should be signed by the Authority or delegated signatory (IPTL) and the Contractor/DA. The DA signature is to confirm agreement with the contents including any changes agreed by the IPT. Note: The MPF is initially approved by the Authority or delegated signatory (IPTL) with the agreement of the commercial branch to proceed subject to contract amendment.

BOX 22: Give a brief statement of why the modification is necessary and how it achieves its purpose if this is not apparent from the "title and description" box. Details of known failures (Service or civilian) should be given, including the incidence of faults or defects. If the modification proposal is being re-submitted record the issue number of the MPF and state the reason for the re-submission. Where a modification is introduced either as a result of a change in specification or as a result of a new specification requirement, this should be stated and the specification identity and issue quoted. When the design of a trial installation for another modification is proceeding concurrently and there is a possibility of duplication of effort, this should be made known in the evidence as early as possible. Reference should not be made to correspondence or documentation that is not available to the IPT unless extracts from this correspondence or documentation are also given.

D2.2. The following is a standard list of origins for modifications. Each Modification Proposal Form should include a heading from **Column 1**, followed by one or more from **Column 2** or as appropriate.

COLUMN 1	COLUMN 2
MOD User Requirement.	Subsequent to specification
Service Customers' Requirement	Brought about by Service use
MOD Requirement	Consequent upon role change
Design Improvement	Promulgated by User Requirement Form
Design Change	Promulgated by Service Radio Installation Modification requirement
Design Fault	To save weight
Failure To Meet Design Requirements	Resulting from manufacturing experience
Failure To Meet Design Specification Requirements	Resulting from civil operator's experience
Financial Saving	Brought about by DA trials
Commercial Telecommunication Requirements	Bought about by experimental trials
Production Improvement	Due to non-availability of component
Production Easement	To ease servicing
Quality Improvement	To extend life of item
Recording Requirement	To meet a Joint Requirement
Improved Reliability	Consequent upon a change to another item
Incompatibility	To cover design change in embodiment loan equipment
Legal Requirements	Consequent upon circuit or system change.
Safety	Consequent upon a change of material
	Resulting in/from a foul
	Resulting in/from a fire hazard
	Bought to light by strength tests
	Bought to light by fatigue tests
	Bought to light by environmental tests
	To eliminate radiation hazard
	To introduce frequency change in previous modification

Annex E

Modification Classification Categories

E.1 The following should be considered when categorising the modification proposal:

- a) Safety - Personnel (members of the public and Services) during the use, maintenance, transportation, storage and disposal of equipment;
- b) Operational and/or technical value - Including overall performance and interoperability, design and reparability;
- c) In-Service aspects - Including areas of maintenance, facilities available to the User, support costs, availability and reliability;
- d) Time scale and cost of incorporation - Including current and retrospective action on in-Service equipment;
- e) Environmental issues;
- f) Financial implications - in terms of whole-life costs - Including the cost of material, labour, trials, modification kits and retrospective embodiment.

E.2 An alphabetical classification shall apply to materiel in production as follows:

- a) **Class AA:** Class AA modifications are those, whose incorporation is essential for the initial Release to Service(s) or approval for the introduction of a new equipment, and shall be embodied in all such items of main equipment prior to delivery.
- b) **Class A:** Modifications that are essential. Non-embodiment will involve safety, non-availability or impose severe operational limitations. They shall be embodied irrespective of any delay in delivery or scrap involved.
- c) **Class B:** Modifications that are high priority. Non-embodiment will involve serious operational limitations or could seriously reduce maintenance efficiency. They shall be embodied forthwith and parts made available as soon as practicable. Scrap and delay in delivery are permissible when authorised by the change committee.
- d) **Class C:** Modifications that are important improvements for technical or operational reasons. They shall be embodied in production as soon as parts can be made available provided there is no delay in delivery.
- e) **Class D:** Modifications that are less important improvements than class C. They shall be embodied in new production provided no scrap or delay in delivery is involved.

E.3 Special Order Only (SOO) applies to modifications which are necessary to satisfy a limited operational need to apply to a limited quantity of equipment. Examples are:

- a) Specific operational requirements which can be satisfied on a scale of less than one per aircraft or missile or equipment e.g. drop tanks, tropical and arctic equipment;
- b) Those introducing special to type Service support equipment, tools or test equipment;
- c) Those used to evaluate a modification.

E.4 A numerical classification shall apply to In-Service materiel that is held for urgent action to be taken by the user (except for nominated in-service major repair units). Numerical classifications shall apply also to materiel delivered to, or held by an In-service Contractor:

- a) **Class 1:** Essential Modifications. When the absence of the change would adversely affect safety or impose severe operational limitations. They shall be embodied immediately and are compulsory. Spares shall also be modified or scrapped as agreed by the change committee
- b) **Class 2:** Modifications that are high priority. When the absence of the change would impose serious performance or other operational limitations including the reduction of maintenance efficiency. They shall be embodied and are compulsory, the extent and the timing to be decided by the change committee.
- c) **Class 3:** Modifications that are important (but less than class 2) for the improvement of operational efficiency, reliability, economy, servicing or maintainability to be gained, is judged by the change committee to outweigh the cost and effort of retrospective embodiment.
- d) **Class 4:** Modifications that are Non-retrospective. When the change committees decide it is necessary to withdraw and modify or scrap existing spares. If required, they shall be embodied during repairs or reconditioning but only SLP is used hereafter.
- e) **Class 5:** Modifications that are Non-retrospective which have no effect on the interchangeability of spares. If required, shall be embodied during repairs or reconditioning or when stocks of unmodified spares are used up.
- f) **Class 0:** Modifications that have no In-service implications.

E.5 The full classification for configuration change that is applicable either to the Contractor and/or the In-service user shall be indicated by the following appropriate classifications:

- a) A/2; B/1; C/2; D/4 etc. (In-production & In-service application);
- b) A/-; B/-; C/-; D/- (In-production application without In-service application designated);
- c) A/0; B/0; C/0; D/0 (In-production application with no In-service application).

E.6 Riders or qualifications to modifications classifications

E.6.1 Contractor and Service modification classifications may have certain riders or qualifications to notify the contractor and the Services of the extent to which a modification is to be applied. These riders or qualifications shall be included in all references to the modification.

E.6.2 The modification committee may also recommend the use of either Service modification parties (SMP) or contractors' working parties (CWP). The CWP may be used for the embodiment of modifications in Classes 1, 2 and 3 where the work involved is considered to be beyond the capacity of the Service.

E.6.3 Examples of such riders and qualifications are:

- a) **On Removal of Unmodified Item** (to be named with part/North Atlantic Treaty Organisation (NATO) stock no or On Removal of Associated Parts, e.g. engine, radar scanner or tailplane. This means that the modification should be embodied on the first occasion that the named item or the associated part is removed, subject to the modification kit being available.
- b) **On Replacement of Unmodified Item** (to be named with part/NATO stock no). This means that the modification should be embodied on the first occasion that the named item becomes unserviceable, subject to a modified item being available.
- c) **By Return of Unmodified Item** (to be named with part/NATO stock no) to the contractor or selected Service unit (to be named). This means that the modification required to the item is considered to be beyond the scope of first and second line servicing.
- d) **WOTSAC** (When Old Type Spares Are Consumed). This is used to indicate that interchangeability is affected and that the modification will be embodied when old type spares are consumed.
- e) **NOROR** (Not On Repair or Reconditioning). This means that the modification will not be embodied on repair or reconditioning.
- f) **Satisfied by** The identity will be quoted where a Service modification or corrective action taken under a special instruction (technical) and the subsequent contractor's modification are identical or there are no significant differences between them.
- g) **Superseding** The identity will be quoted where there are significant differences between a Service modification or corrective action taken under special instructions (technical) and the subsequent contractor's modification.
- h) **Embodiment on R&R (Repair and Recondition) at No(X) MU (Maintenance Unit)**. The identification of the MU concerned is to be inserted .

Annex F

Configuration Audits

F.1 General

F.1.1 For those requirements, which cannot be completely verified through the use of testing, the FCA should determine whether adequate analysis or simulations have been accomplished and whether the results of the analysis or simulations are sufficient to ensure that the CI meets the requirements in the specification. All approved Changes should be reviewed to ensure that they have been incorporated and verified. The CA sub processes are illustrated below.

F.2 Configuration Audits

F.2.1 A FCA would be required to demonstrate that the CI has met its specified functional requirements. This should be carried out prior to the establishment of the PBL after the PCA.

F.2.2 A PCA would be required to ensure that the CI has met its specified physical requirements. Subsequent to the PCA the PBL should be established and all subsequent changes would be made via approved modifications.

F.2.3 A FCA should be conducted for each CI, or group of CIs, for which a separate development/requirement specification has been baselined, unless otherwise specified in the contract. The objective of the FCA should be to verify the CIs and systems performance against the approved configuration documentation.

F.2.4 The PCA should be the formal examination of the as-built configuration of the CI against its design documentation. The PCA should normally be initiated after the FCA.

F.3 Participation and Responsibilities

F.3.1 The Contractor would be responsible for supporting the Authority in conducting configuration audits in accordance with the following requirements:

- a) The Contractor should be responsible for ensuring that the appropriate subcontractors, vendors, and suppliers participate in the Authority's configuration audits.
- b) The Contractor should provide the necessary resources, material and the facility to perform the configuration audit effectively. The following list can be used to plan and conduct the type and scope of audit required by the CMP:
 - Configuration audit plan.
 - Specifications, drawings, manuals, schedules, and design and test data.
 - Inspection reports, process sheets, data sheets and other documentation.
 - Tools and, measuring and inspection equipment necessary for verification and validation.
 - Access to the areas and facilities including – goods inwards inspection, manufacture, inspection and testing.
 - Access to personnel from engineering, manufacturing, configuration and quality.
 - CI(s) to be audited.

F.3.2 The Contractor would be responsible for establishing the time/place/date, and agenda for each configuration audit in consonance with the master project milestone schedule, subject to co-ordination with the Customer. This should be accomplished sufficiently in advance of each configuration audit to allow adequate preparation. In addition the Contractor should:-

- a) Ensure that each configuration audit schedule is compatible with the availability of the necessary information and CMP requirements, e.g. - engineering data (in accordance with Contract Data Requirements List, producability analysis, risk analysis, specifications, manuals, drawings, reports, hardware, software, or mock-ups).
- b) Appoint an audit team leader (configuration specialist) for each configuration audit.
- c) Ensure that all presenters are prepared to discuss in detail any of the presented material within the scope of the configuration audit.
- d) Record the official configuration audit meeting minutes.
- e) Ensure that recommendations not accepted are recorded together with the reason for non-acceptance.
- f) Ensure that minutes of previous sessions are available for review by both the Authority and Contractor at the beginning of successive sessions.
- g) Ensure minutes of the complete configuration audit are available for review by the Authority configuration audit team prior to their leaving the configuration audit site.
- h) Record all comments and take steps to resolve each one.

F.4 Methods

F.4.1 For a Functional Configuration Audit:

- a) Test data for the FCA should be that collected from the test of the configuration of the item that is to be formally accepted or released for production. If a prototype or pre-production model is not produced, the test data should be that collected from test of the first production item
- b) For complex systems CIs, the FCA may be carried out in increments. In such cases, a final FCA may be conducted to ensure that all requirements have been satisfied.
- c) In cases where CI verification can only be completely determined after system integration and testing the final FCA should be conducted as part of the PCA.

F.4.1.1 Prior to the FCA date, the Contractor would provide the following information to the Authority:-

- a) Contractor representation.
- b) Identification of items to be audited - including nomenclature and specification identification number.
- c) Current listing of all concessions against the CI
- d) A FCA check sheet that identifies documents to be audited and tasks to be accomplished at the FCA of the CI.
- e) A briefing for each CI being audited and should delineate the test results and findings for each CI. As a minimum, the discussion should include CI requirements that were not met, including a proposed solution to each item, a configuration status of all changes introduced and tested, and any further proposed changes that would require embodying to meet the specification requirements.

F.4.1.2 The audit should also include; the Contractor's test procedures and results would be reviewed for compliance with specification requirements and provide the following testing information to the Authority FCA team:

- a) Test plans, specifications, descriptions, procedures and reports for the CI.
- b) A complete list of the successfully accomplished tests during which pre-acceptance data was recorded.
- c) A complete list of tests required by the test requirements but not yet performed i.e. to be performed as a system or subsystem test.
- d) Pre-production test results.

F.4.1.3 An audit of formal test plans, specifications and procedures should be made and compared against official test data. The results should be verified for completeness and accuracy. Deficiencies should be documented and made a part of the FCA minutes. Interface requirements and the testing of these requirements should be reviewed. Completion dates for all discrepancies should be clearly established and documented.

F.4.1.4 For those requirements, that cannot be completely verified through the use of testing, the FCA should determine whether adequate analysis or simulations have been accomplished and whether the results of the analysis or simulations are sufficient to ensure that the CI meets the requirements in the specification. All Changes that have been approved should be reviewed to ensure that they have been technically incorporated and verified.

F.4.1.5 An Audit of the test report should be performed to validate that the reports are accurate and completely describe the CI tests. Test reports, procedures and data used by the FCA team should be made a matter of record in the FCA minutes.

F.4.1.6 A list of the Contractor's internal configuration documentation of the hardware CI should be reviewed to ensure that the Contractor has documented the physical configuration of the hardware CI for which the test data are verified.

F.4.1.7 Drawings of the CI parts, which are to be provisioned, should be selectively sampled to ensure that the test data essential to manufacturing are included on, or provided with, the drawings.

F.4.1.8 CIs that fail to pass quality requirements are to be analysed as to the cause of failure to pass. Appropriate corrections should be made before a CI is subject to re-verification.

F.4.1.9 For Computer Software Configuration Items (CSCI) the following additional requirements should apply:

- a) Review database characteristics, storage allocation data and timing, a sequencing characteristic for compliance with specified requirements.
- b) Review all documents, which comprise or describe the contents or the use of the software product for format and completeness.
- c) Review the records that reflect the changes made to the development configuration for the CSCI.
- d) Review the listing of all versions of the developmental and non-developmental software for the CSCIs that are in the Software Library.
- e) Review the findings of all internal CM and Quality audits of the CSCI.

F.4.1.10 Design Reviews and Critical Design Review minutes should be examined to ensure that all findings have been incorporated and completed.

F.4.1.11 Post FCA Audit Actions - after completion of the audit the Contractor should:

- a) Publish copies of the FCA minutes.
- b) Record the accomplishment and results of the FCA in the Configuration Status Accounting (CSA) database for each CI audited.
- c) Carry out remedial action as per the agreed requirement.

F.4.1.12 A FCA certificate should be issued for the CI audited by the contractor with the agreement of the FCA audit team.

F.4.2 A Physical Configuration Audit:

- a) Should be the formal examination of as-built configuration of a CI against its design documentation;
- b) Should not be started unless the FCA of the CI has already been accomplished or is being accomplished concurrently with the PCA;
- c) Should determine that the acceptance testing requirements prescribed by the documentation is adequate for acceptance of production units of a CI by quality assurance activities;
- d) Should include detailed audit of drawings, specifications, technical data, tests utilised in production of the CIs, and design documentation, listings, and operation and support documents for the CSCIs;
- e) Should include an audit of the released documentation and quality control records to make sure the as-built or as-coded configuration is reflected by this documentation, and for software, the product specification, Interface Design Document should be part of the PCA;
- f) Should be carried out on a selected CI as agreed by the Authority and the Contractor.

F.4.2.1 The scheduled dates, actual accomplishment dates, for the PCA(s) should be recorded in the CSA and CMP documentation. All approved internally and external configuration changes should be incorporated into new revisions of the applicable configuration documentation prior to the PCA. A final draft product specification should be made available to the Authority for review prior to the PCA.

F.4.2.2 Prior to the PCA the Contractor should provide the following information to the Authority on the CI to be audited by:

- a) Nomenclature.
- b) Specification Identification Number.
- c) CI Identifiers.
- d) Serial Numbers.
- e) Drawing and Part Numbers.
- f) List of concessions/production permits against the CI.

F.4.2.3 Reference information to the CI being audited should be as follows:-

- a) CI product specification.
- b) A list delineating both approved and outstanding changes against the CI.
- c) Complete shortage list.
- d) Acceptances test procedures and associated test data.

- e) Draft CSR and design standard.
- f) Operating and support publications, including all Maintenance manuals (or as per contract requirements).
- g) Proposed - Certification of Design.
- h) Version Description Document for software.
- i) Approved nomenclature and nameplates.
- j) FCA minutes for each CI Findings/Status of Quality Assurance Programmes
- k) Initial Recommended Spares List.
- l) Interface Design Document for Software.

F.4.2.4 The Contractor should collate and make available to the PCA team at the time of the audit all data describing the CI configuration, to include:

- a) Current approved issue of hardware development and software and interface requirement specifications to include approved Software Change Notes and approved concessions.
- b) Identification of all changes actually made during test.
- c) Identification of all required changes not completed.
- d) All configuration documentation, or electronic representations of the same, required identifying the CI.
- e) Manufacturing instructions, manufacturing process sheets or CAM data related to drawings and CAD presentations of specified parts identified by the Authority.
- f) Should include an audit of the released documentation and quality control records to make sure the as-built or as-coded configuration is reflected by this documentation, and for software, the product specification, Interface Design Document should be part of the PCA;
- g) Should be carried out on a selected CI as agreed by the Authority and the Contractor.

F.4.2.5 Identify any differences between the physical configurations of the selected production CI and the development CIs used for the FCA and certify or demonstrate to the Authority that these changes do not degrade the functional characteristics of the selected CI.

F.4.2.6 The following CA procedures and requirements should be performed as part of each PCA:

- a) Review a representative numbers of drawings/specification (and/or CAD data) and associated manufacturing process sheets (and/or CAM data) for each item of hardware identified by the Authority. The purpose of this review is to insure that the manufacturing process sheets (and/or CAM data) accurately reflect all design details contained in the drawings/specification (and/or CAD presentations).
- b) The following minimum information should be recorded in the minutes for each drawing (and/or CAD presentation) viewed:-
 - i) Drawing number/title (include revision identifier).
 - ii) List of manufacturing process sheets and/or CAM data (numbers with change letter/titles) associated with this drawing.
 - iii) Discrepancies/comments.

- iv) A sample of Part numbers reflected on the drawing. Check to ensure that they are compatible with the Logistic Initial Recommended Spares List, and examine the CI to ensure that the proper parts are actually installed.

F.4.2.7 As a minimum, the following inspections should be accomplished for selected drawings (and/or CAD presentations) and associated manufacturing processes (and/or CAM data):

- a) Drawing number identified on manufacturing processes (and/or CAM data) should match the latest released drawing (and/or CAD presentation).
- b) List of materials on manufacturing processes (and/or CAM data) should match materials identified on the drawing (and/or CAD presentation).
- c) Nomenclature descriptions, part numbers, and serial number markings called out on the drawing (and/or CAD presentation) should be identified on the manufacturing processes (and/or CAM data).
- d) Drawings (and/or CAD presentation) and associated manufacturing processes (and/or CAM data) should be reviewed to ascertain that all approved changes have been incorporated into the CI.
- e) Release records should be checked to ensure all drawings (and/or CAD presentations) reviewed are identified.
- f) The number of any drawings (and/or CAD presentations) containing more than five outstanding changes attached to the drawing should be recorded.
- g) The Concession requests, drawings (and/or CAD presentations) of a major assembly/black box of hardware CI should be checked for continuity from top drawing down to piece-part drawing.
- h) Ensure that the approvals by the Authority are present where required.

F.4.2.8 The Contractor's Parts Catalogue should be compared to the hardware CI/Design Standard/Bill Of Materials to ensure only approved parts are listed.

F.4.2.9 Review all records of the configuration for the CI by direct comparison with the Contractor's release system PDM or other and Configuration Change Management procedures to verify that the configuration being produced accurately reflects released data. This includes interim release of spares/repair parts provisioned prior to PCA to ensure delivery of currently configured spares/repair parts.

F.4.2.10 The Software library, or similar internal support activity, is to be audited to ensure that it accurately identifies, controls, and track changes to the software and documentation.

F.4.2.11 The Contractor's Configuration Change Management control mechanism should be audited to ensure that it correctly controls all internal and external changes. This would be accomplished by 'audit trailing' an internal and external change authority from concept to implementation on the CI.

F.4.2.12 CI acceptance test data and procedures should comply with product specifications. The PCA team should determine any acceptance test to be re-accomplished, and reserves the right to have representatives from the Authority witness all or a portion of the required audits, inspections, or tests.

F.4.2.13 CIs which fail to pass acceptance testing should be repaired if necessary and should be re-tested by the Contractor either in a manner specified by the PCA team leader or in accordance with the Product specification. The Authority should be informed of the repaired status of the item.

F.4.2.14 The Contractor should present data confirming the inspection and test of subcontractor equipment end items at point of manufacture. (Sub-Contractor Data Requirement List / Data Item Description). Inspection and test should have been witnessed by the Contractor or in accordance with the contract.

F.4.2.15 CIs that have demonstrated compliance with the product specification should be approved for acceptance. The PCA team should certify by signature that the CI has been built in accordance with the drawings and specifications at the agreed baseline.

F.4.2.16 As a minimum, the PCA team on each CSCI being audited should perform the following actions:

- a) Review all documents, which should comprise the product specification for format and completeness.
- b) Review FCA minutes for recorded discrepancies and actions taken.
- c) Review the design descriptions for proper entries, symbols, labels, tags, references and data descriptions.
- d) Compare detailed design descriptions with the software listing for accuracy and completeness.
- e) Examine CSCI delivery media (disks, tapes, etc.) to ensure conformance with the software requirements specifications.
- f) Review the annotated listings for compliance with approved coding standards.
- g) Review all required operation and support documents for completeness, correctness, incorporation of comments made at critical Design Review, and adequacy to operate and support the CSCI(s).
- h) Examine all related documentation to ensure that the relationships of the CSCI to the parts, components or assemblies that store the executable forms of the CSCI are properly described. For Firmware, ensure that the information completely describes the requirements for installation of the CSCI into the programmable parts or assemblies and that this information has been properly implemented. Where follow-on acquisition of the firmware items is intended, ensure that the documentation has been accomplished to the level of detail necessary for the intended procurement.
- i) Demonstrate, using deliverable or Customer owned support software, that each CSCI can be generated. The regenerated CSCI should be compared to the actual CSCI delivery media to ensure that it is identical.

F.5 Final Conference

F.5.1 The intent of the Final Conference is to establish if the aim of the PCA has been successfully carried out.

F.5.2 The authorised team leader should summarise the findings of the PCA from their perspective, and should identify all relevant remedial actions & corrective action (Discrepancies). A summary report should be available to all Authority's and Contractor team members.

F.5.3 All outstanding contractual requirements should be reviewed and any liability issues resolved.

F.5.4 The Contractor representative should summarise the Contractor's reactions and acceptance of the Authority actions on the Contractor in respect of:

- a) Certification of the CI.
- b) Outstanding contractual issues in respect to the CI.
- c) Outstanding liability issues (if any).

F.5.5 Post PCA actions:

- a) The Contractor should be notified in writing to the Authority of acceptance or rejection of the PCA, the PCA status and comments, criticisms to be corrected, or rejection of the PCA and requirements for re-accomplishment.
- b) The Contractor should, after completion of the PCA, publish and distribute copies of the PCA as specified in the contract.
- c) The Authority and the Contractor(s) should duly sign PCA certification.

F.5.6 The CSR (Specifications, Drawings, Configuration Status Accounting, etc.) should be sealed for Production initiation. The CSR should be supplied to the Authority if required.

Note: Such review does not necessarily constitute an approval of the statements made in the minutes and does not relieve the Contractor from answering all points raised by the Authority and obtaining the requisite Authority signature of completion/acceptance.

Annex G

CONFIGURATION MANAGEMENT REQUIREMENTS – AIR SYSTEMS

G.1 Further requirements to be applied to Aircraft, Airborne Systems and associated materiel shall be applied in accordance with:

- a) Defence Standard 05-123 Technical procedures for the Procurement of Aircraft, Weapons and Electronic Systems**
- b) Defence Standard 05-124 Procedures for the Procurement of Aircraft Engines and their Accessories**

Annex H

CONFIGURATION MANAGEMENT REQUIREMENTS – LAND SYSTEMS

H.1 General Requirements

H.1.1 This section provides additional information concerning the application of CM for Land Systems equipment, which were previously covered by the procedures contain within Land Systems Procedure No 123 (LSP 123).

H.1.2 The additional information highlights activities of CM, which are necessary for the approval and implementation of in-service modifications for Land Systems equipment. It is concerned with the control of Modifications after design documents have been brought UMC through the formal committee structure detailed in the CM Plan.

H.1.3 It details procedures for processing MPF's, agreeing or otherwise prices for the work and obtaining subsequent authority for the work to proceed.

H.2 Configuration Control Board (CCB)

A CCB is responsible to the IPTL for supervising CM by reviewing changes to the equipment specification or its design which could significantly affect: performance, reliability and sustainability, cost, timescales or delivery.

H.3 Configuration Control Committee (CCC)

A CCC may be instigated and shall be responsible to the CCB for the CM of specified CIs.

H.4 Design Documentation

H.4.1 When the equipment system becomes UMC, a full set of documents, the CSR, shall be made available for use by MOD. The documentation in the set shall include all of the technical information necessary to enable the CM, Modification, manufacture, inspection, testing, packaging, installation, safe operation, servicing and disposal of the equipment.

H.4.2 When the design incorporates Government Furnished Assets (GFA) it will be sufficient for the GFA item to be invoked in the appropriate Items List by its official title (nomenclature) and NSN.

H.5 Initiation and Management of Design Documents

H.5.1 All design documents shall be identified and issue referenced to indicate the recording of design changes in accordance with the principles of Def Stan 05-10. Design changes which result in the creation of a new derivative, mark, model or variant, may require the production of new masters but, whenever possible, only those masters required by the change should be provided.

H.5.2 Where a CI is common to more than one variant and the need arises to change that CIs design for one variant only, new masters shall be produced for the changed CI and any immediate assembly. The masters defining the unchanged CI and any immediate assembly shall be retained for the other variants. Since this procedure requires separate CSRs to be maintained for each variant, only the CSRs for those variants using the new item require amendment. No attempt shall be made to retain different issues of the same master document to describe different derivatives, marks, models or variants in service at the same time.

H.6 Configuration Baselines

Configuration baselines shall be established at significant points in the life cycles of major CIs when it is necessary to declare new formal departure points for the control of future changes. Each new derivative, mark, model or variant of a major CI shall be defined by a new baseline and shall be declared to be a new derivative, mark, model or variant depending on how its functional or physical characteristics differ from its predecessor's. Baselines for production shall be quoted in terms of the relevant CSR or Drawing List reference and Issue State.

H.7 Certificate of Design

H.7.1 Certificates of Design provide summaries of evidence required before procurement or introduction into service can occur. The DA shall submit Certificates of Design when:

- a) Equipment is to be delivered for MOD sponsored trials.
- b) Equipment is to be offered for Acceptance into Service.
- c) Approval for Procurement is sought.
- d) Required by the IPT as such a when the design of an item is changed such that the IPT requires it to be described as a new derivative, mark, model or variant.

H.7.2 Certificates of Design shall be supported by:

- a) An CSR or equivalent drawing list.
- b) A list of reports on all tests conducted to show compliance with the specification.
- c) A list of subsidiary Certificates of Design agreed by the DA for material designed and developed by other DAs or firms and incorporated into the design. Those for GFA will be provided by the IPT.
- d) A Safety Case, where appropriate.

H.7.3 Certificates of Design, in the format shown in Def Stan 05-123 Part 1, shall be signed by an agreed nominated member of the DAs staff.

H.7.4 The DA shall submit the Certificate of Design and its supporting documentation to the IPT who may request the DA to attend a meeting to review the documents. The IPT will acknowledge any exceptions and limitations by completing the box on the Certificate of Design reserved for this purpose. This endorsement by the IPT does not imply acceptance of responsibility for the design, which remains with the DA.

H.7.5 The DA shall note that, dependant on the declared exceptions and limitations, IPT endorsement may be conditional. In such cases the IPT shall state the conditions of endorsement on the Certificate of Design.

H.7.6 The DA shall retain the master Certificate of Design as part of the Configuration Account and distribute copies as required by the IPT.

H.8 Proposals for Modifications

H.8.1 Proposals for Modifications may be made to the IPT by any authority involved with the project including manufacturing contractors. However a formal proposal may only be drafted and submitted to the appropriate committee with the sanction of the IPT and by the DA responsible for the CI concerned. The nature of the proposal and the CI concerned will dictate which committee is appropriate.

H.8.2 The originator shall submit each proposal for a Modification to the IPT who will, if he considers it valid, instruct the DA to draft the proposal formally in accordance with the terms and conditions of the relevant Contract. They will then submit it to the members of the appropriate committee in sufficient time to allow formal consideration at the next suitable meeting. If the proposal affects CIs for which the DA is not responsible the proposal shall be copied to all other DAs affected. In parallel with the drafting of the proposal the DA shall, unless otherwise stated in the Contract, submit a firm price quotation for the work to the relevant IPT.

H.8.3 Whenever a new derivative, mark, model or variant is introduced, a revised Certificate of Design will be required. The MODIPTL will therefore indicate which system is to apply and how it is to be controlled and operated.

H.8.4 In the first instance the CCC or equivalent is concerned only with advising the Chairman whether he should authorise expenditure for implementing Modifications or for undertaking preparatory design work and, if required, a trial installation of prototype modifications.

H.8.5 Modification preparation work may be needed to identify in detail the proposed changes to the design. This may entail the production of preparatory drawings and/or the marking up of copies of existing drawings. Any work to be done by Sub-Contractors shall be included. Production drawings must not be altered at this stage.

H.8.6 CCB or CCC authority must be obtained before any Trial Installation (TI) is undertaken. A TI is the physical and/or functional proof of a proposed design change. It will usually involve the manufacture and testing of hardware and/or software and its embodiment in fully representative equipment. Where a TI is authorised it shall be used to ascertain whether the design change achieves its purpose without adverse effect on other physical and/or functional and/or ILS aspects of the design.

H.8.7 When proposals for more than one modification are being considered concurrently, the Contractor may find it necessary to integrate the design of the modification in such a way that they can only be embodied concurrently; in which case, this should be stated on the MPF. In other cases, it may be desirable to arrange for correlation in the design of separate modifications in the interest of weight saving, cost reduction, reduction in total man-hours for embodiment, or other desirable features. Details of such correlation shall be included in the proposal in order that all concerned may be aware of the consequences of cancelling the implementation of a modification, which has already been agreed.

H.8.8 If the DA proposes to implement the modification at zero cost to the MOD, the IPT/DS may agree implementation of the change(s) without prior CCC consideration.

H.9 Action by Contractor after Approval of Modifications

H.9.1 When modification has been approved in accordance with the requirements of the Contract, the Contractor shall:

- a) Incorporate the modification details in the CSR, master design documents and relevant support publications for which he is responsible. The Approval Reference quoted on the changed masters shall be the approved MPF reference.
- b) Prepare any necessary draft support documentation.
- c) Provide copies of new or updated design documents for information as required by the Contract.
- d) Take any necessary codification action.

Copies of completed MPF shall be distributed by the Contractor in accordance with a list to be provided by the IPT.

Annex I

CONFIGURATION MANAGEMENT REQUIREMENTS – MARITIME SYSTEMS

I.1 Further guidance on configuration management requirements for maritime systems can be found in the following Defence Standards:

I.1.1 Submarines

- a) Def Stan 02-28 Configuration Management – Nuclear Submarines – In Service Support
- b) Def Stan 02-38 Requirements for the Preparation, Identification and Management of Datum Pack Drawings and Photographs for S&T Class Nuclear Submarines

I.1.2 Surface Ships

- a) Def Stan 02-41 Requirements for Configuration Management of Surface Ships
- b) Def Stan 21-88 Policies and Procedures for Combat System Integration in Surface Ships

I.1.3 Combat System Interfaces

Def Stan 21-13 Combat System Interface and Link Documentation

Note 1: Combat System documentation infrastructure and visibility of all the Combat System interfaces on a platform and across platforms is provided, both platform and equipment viewpoints of the interfaces, by the Systems Interface & Co-Ordinating Agency (SiCA) database. It provides a consistent format for Interface and Link Documentation, necessary for successful configuration management of the Combat System, and it also enables the recording of equipment cabling for each platform. The SiCA database can be found at www.sicad.r.mil.uk

I.1.4 Master Records Index (MRI)

Def Stan 21-12 Master Records Index

Note 2: The MRI is a record of the build standard of equipment and related documentation, and is widely used within the maritime environment. It can be considered as an equivalent to the Configuration Status Record (CSR). Def Stan 21-12 provides information on the preparation of a MRI and the MRI code of practice.

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Defence Standards are Published by and Obtainable from:

Defence Procurement Agency

An Executive Agency of The Ministry of Defence

UK Defence Standardization

Kentigern House

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GLASGOW G2 8EX

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File Reference

The DStan file reference relating to work on this standard is D/DSTAN/24/57.

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