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CONTRACT CONDITIONS, TECHNICAL, STANDARD FOR

SUBTITLE : **PART 7: REFINING AN OPERATING BASELINE FOR EXISTING SYSTEMS**

SUMMARY : **ARMSCOR'S TECHNICAL CONTRACT REQUIREMENTS FOR REFINING AN OPERATING BASELINE FOR EXISTING SYSTEMS, LOGISTICS RE-ENGINEERING, CUSTOMIZATION, OR CONVERSION OF LOGISTICS TO REFINE AN OPERATING BASELINE**

KEYWORDS : **LOGISTICS, TECHNICAL CONTRACT CONDITIONS, REFINING AN OPERATING BASELINE FOR EXISTING SYSTEMS, RE-ENGINEERING, CUSTOMIZATION, CONVERSION OF LOGISTICS**

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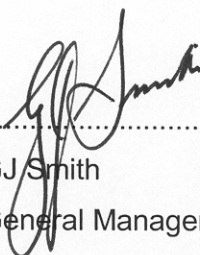
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1 SCOPE

1.1 PURPOSE

A-STD-61 formulates different sets of technical conditions of contract from which ARMSCOR's requirements for the management of the technical effort during the execution of a CONTRACT or ORDER should be selected.

1.2 APPLICATION

These sets of requirements must be tailored to suit the acquisition / procurement of specific products systems, products, product subsystems and components for the specific ORDER.

When these requirements are applied to an ORDER between the Prime CONTRACTOR and a Subcontractor, the Prime CONTRACTOR may, at his discretion or as specified by ARMSCOR, impose tailored requirements based on these requirements.

2 REFERENCE DOCUMENTS

A-UMAN-0199	User Manual for Tailoring of A-STD-61 Files
MIL-STD-756	Reliability Modelling and Prediction
MIL-STD-1543	Reliability Program Requirements for Space and Launched Vehicles
RSA-MIL-STD-3	Acquisition Baseline, Standards for
RSA-MIL-STD-4	Acquisition Glossary
RSA-MIL-STD-8	Minimum Requirements for Software Development
RSA-MIL-STD-10	Manuals, Technical: General Style and Format Requirements
RSA-MIL-STD-122	Documentation, User System, General Requirements for (SA Army)
RSA-MIL-STD-128	Training, User System, General Requirements for (SA Army)
SAAO/GS4/02/011/99/1	Policy and Procedures for a Minimum Logistics Programme in Preparation of Weapon System Data

3 ABBREVIATIONS

Refer to Appendix 2 for a list of abbreviations.



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4 DEFINITIONS

The following terminology and the accompanying definitions will be adhered to in this standard. In general, definitions and terminology contained in RSA-MIL-STD-4 will be applicable.

4.1 ARMSCOR'S PROGRAMME MANAGER

The person, or his delegated representative, designated by ARMSCOR to assume the programme management responsibility for user and CONTRACTOR interfaces.

4.2 CERTIFICATION

Legal recognition by the certification authority that a product, service, organisation or person complies with the applicable requirements. Such certification comprises the activity of technically checking the product, service, organisation or person and the formal recognition of compliance with the applicable requirements by issuing of a certificate, licence, approval or other documents as required.

4.3 CERTIFICATION FOR SAFETY OF FLIGHT

The definition in §4.2 applies.

In addition certification of a product for safety of flight involves:

- i. The process of assessing the design of a product to ensure that it complies with a set of standards applicable to that type of product so as to demonstrate an acceptable level of safety;
- ii. The process of assessing an individual product to ensure that it conforms to the certified type design; and
- iii. The issuing of a certificate required by national law to declare that compliance with or conformity to standards has been found in accordance with items (i) or (ii) above.

4.4 COMMISSIONING

Commissioning is the process whereby the integrity of the proposed Operating Baseline of the products system is qualified to ensure that the stated requirements are met.

4.5 CONCEPT PHASE

The period during which comprehensive system studies and experimental hardware efforts are accomplished. Activities that are included are:

- Feasibility assessment;
- Logistic support estimate;
- Trade-off studies; and
- Cost-effectiveness and utility studies.

The results from this phase are normally formally documented in the Functional Baseline.



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4.6 CONFIGURATION ITEM

An aggregation of hardware/software, or any of its discrete parts, which satisfies an end-use function and/or is designated by the client for configuration management.

4.7 CONTRACTOR

The party with whom the order has been placed by ARMSCOR, and includes the CONTRACTOR's successors and permitted assignees.

4.8 CONTRACT BASELINE

A document or set of documents formally designated and fixed at a specific time during a programme or configuration item's (CI's) life cycle forming the basis for contracting and control. Baselines, plus approved changes to those baselines, constitute the current basis for control.

Programme baselines and contract baselines are not necessarily the same. RSA-MIL-STD-3 identifies and defines the following six programme baselines:

- Statement of Requirements Baseline (SRBL);
- Functional Baseline (FBL);
- Allocated Baseline (ABL);
- Product Baseline (PBL);
- Manufacturing Baseline (MBL); and
- Operating Baseline (OBL), elsewhere often referred to as Operational Support Baseline (OSBL).

4.9 CONVERSION ("REPACKAGING") OF A LOGISTIC SUPPORT SYSTEM

The re-packaging of a logistic support system is a process of converting an existing, locally deployed support system (LSAR and logistic elements) with minimum effort and resources to re-align support data to be compatible with SANDF Products System Management requirements and without affecting the design.

4.10 CUSTOMIZATION OF AN INTEGRATED LOGISTICS SUPPORT SYSTEM

The customization of an integrated logistics support system is a process of adapting an existing foreign support system (LSAR and logistic elements) to be compatible with SANDF Products System Management requirements, without affecting the design.

4.11 DEFINITION PHASE

The objective of the Definition Phase is to identify and analyse subsystem alternatives, examine risky subsystems and determine whether to proceed with development. The results of this phase are normally formally documented in the Allocated Baseline.

4.12 DEVELOPMENT PHASE

The purpose of the Development Phase is to provide the design documentation necessary for production and the integrated logistic support documentation necessary to fully support the system. This is done by completing detailed design and demonstrating that reliability,



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producibility, supportability and performance requirements have been met. The results of this phase are normally formally documented in the Product Baseline.

4.13 OPERATING BASELINE

The documented results from the Acquisition Phase of a programme defining the basis for effective Products System Management during operations and support of a products system.

4.14 OPERATING PHASE

The phase during which functional missions of the commissioned system are performed for which the system was developed and produced.

4.15 PRODUCTION PHASE

The primary objective of the Production Phase is to produce and deliver an effective, fully supported system at an optimal cost within the timescales.

4.16 PRODUCTS SYSTEM

A products system is the sum total of prime mission equipment and all the peripheral support elements that are necessary to operate and support the prime mission equipment as a mission ready unit. A products system is a combination of products that forms the materiel of a user system. The term "Products System" refers to a products system at level 5 of the systems hierarchy.

4.17 QUALIFICATION

The process of objectively demonstrating whether an entity is capable of fulfilling specified requirements.

4.18 QUALITY RECORD

A quality record provides objective evidence of the extent of the fulfilment of the requirements for quality or the effectiveness of the operation of a quality system element. The following are examples of quality records:

- Test data;
- Qualification reports;
- Calibration data;
- Inspection reports; and
- Concessions / Waivers / Deviations.

4.19 RE-ENGINEERING OF AN INTEGRATED LOGISTICS SUPPORT SYSTEM

The re-engineering of an integrated logistics support system is a process of upgrading a locally deployed support system (LSAR and logistic elements) through logistic support analysis to be compatible with SANDF Products System Management requirements, in the most cost-effective manner, with the minimum re-work or changes, and without affecting the design.



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4.20 SEGMENT PLAN

A Segment Plan is an engineering management plan which covers all the phases in the acquisition process of a specific sub-programme.

Such a plan, agreed upon between the contracting parties, constitutes a memorandum of agreement between the parties and covers aspects such as:

- Major acquisition milestones and schedules;
- Key milestone schedule;
- Interface milestone schedule;
- High-level Work Breakdown Structure (WBS);
- High-level Contract WBS (CWBS);
- Deliverables;
- Client-furnished equipment (CFE);
- Mandates, policies, values;
- Technical conditions;
- Resource requirements and cash flow;
- Contract phasing; and
- Security.

4.21 USER

The delegated representative of the end user of the system(s)/equipment.

4.22 VALIDATION

Confirmation by examination and provision of objective evidence, to ensure the integrity of particular requirements for specific intended use is achieved.

Note: ISO 9000 requirements for validation include the above as well as the requirements stated under paragraph 4.17.

4.23 VALUE SYSTEM

A collection of elements, including goals, limitations, evaluation factors and criteria for decision-making, which provide a basis for rational decision-making.

4.24 VERIFICATION

Confirmation by examination and provision of objective evidence that specified requirements have been fulfilled.



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5 GENERAL REQUIREMENTS

5.1 DOCUMENT BREAKDOWN

Part 1 : Contract Conditions, Technical, Standard for Highly complex programmes

Part 2 : Contract Conditions, Technical, Standard for Medium complex programmes

Part 3 : Contract Conditions, Technical, Standard for Non-complex programmes

Part 4 : Contract Conditions, Technical, Standard for Production programmes

Part 5 : Contract Conditions, Technical, Standard for Commercial Off-the-shelf (COTS) procurement

Part 6 : Contract Conditions, Technical, Standard for Maintenance programmes

Part 7: Contract Conditions, Technical, Standard for Refining an Operating Baseline for Existing Systems.

5.2 SELECTION GUIDELINES

When these requirements are used for contracting, the following selection guidelines should be considered in order to select the most applicable contracting base (Parts 1 to 7) for compiling specific CONTRACT conditions.

5.2.1 Part 1 should be used when:

- The programme's technical complexity is high, i.e. many complex interfaces, multi-discipline, unknown/untried technologies, etc;
- Technical and financial risks are medium to high;
- System complexity and/or system CONTRACTOR maturity requires a well-structured engineering process and detailed ARMSCOR management;
- System level 5 or higher is involved.

5.2.2 Part 2 should be used when

- The programme's technical complexity is high, i.e. many complex interfaces, multi-discipline, unknown/untried technologies, etc;
 - Technical and financial risks are medium to high;
 - System level 5 or higher is involved;
 - Management of the system engineering process is delegated to the CONTRACTOR because his maturity does not require in-depth ARMSCOR management;
- OR
- The technical complexity is medium;
 - Technical and financial risks are low to medium;
 - System level 5 or lower is involved;
 - The system complexity does not require in-depth ARMSCOR management.



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5.2.3 Part 3 should be used when

- The technical complexity and risks are low, i.e. single-discipline, known technologies, simple or well-defined interfaces;
- There are well-defined and developed components for complex items;
- The system engineering process requires minimal ARMSCOR involvement.

5.2.4 Part 4 should be used when

- The scope of the ORDER is limited to production.

5.2.5 Part 5 should be used when

- The scope of the ORDER is limited to procurement of commercial off-the-shelf items (COTS) or non-developmental items (NDI).

5.2.6 Part 6 should be used when

- The scope of the ORDER is limited to maintenance.

5.2.7 Part 7 should be used when:

- The scope of the order is limited to the refining of an Operating Baseline for existing systems.

NOTE:

When the logistical component of a programme is extensive or complex or the logistical redesign necessitates a multi-disciplinary approach, the relevant content of part 7 should be considered when tailoring other parts of A-STD-61.

5.3 LOGISTIC PROCESS GUIDELINES

The programme manager should use the process described in Figure 1 to establish an effective contracting model and requirements for contracting the industry. With the desired Products System Management functionalities in mind, the OBL contents should be tailored using RSA-MIL-STD-3 as a guideline to include the necessary management / product data and logistic support elements, which are needed for the cost-effective management of the products system during the Operating Phase.

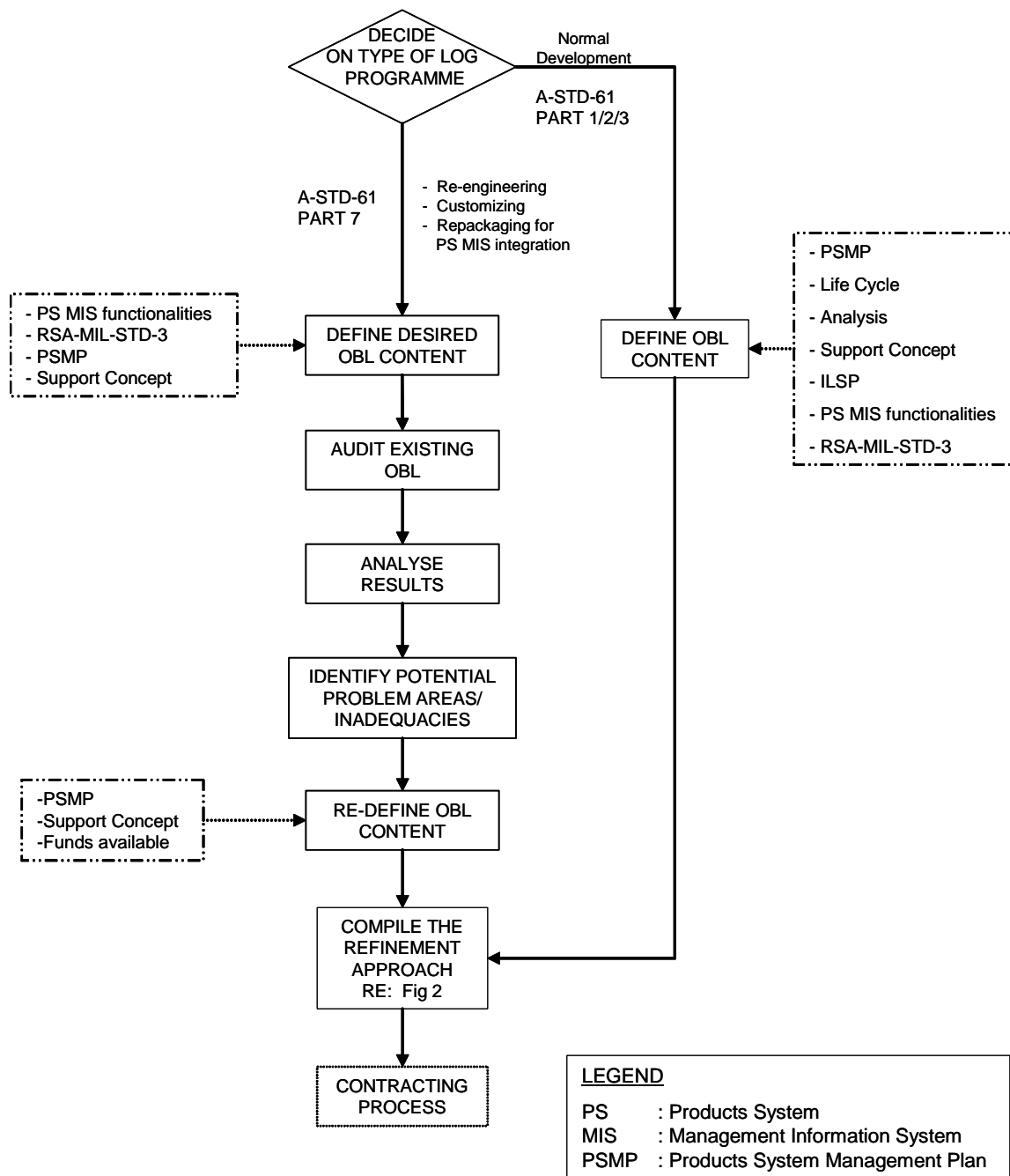


FIGURE 1: LOGISTIC PROCESS SELECTION

Where existing logistic data has to be upgraded for Products System Management information system integration, the status of the existing OBL has to be determined and essential gaps identified. The envisaged OBL then needs to be redefined to include essential and affordable information system functionalities to support Products System Management.

A suitable refinement approach based on the proposed OBL process (“roadmap”) of



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Figure 2 on page 31 should be followed to establish the defined OBL.

The logistic work breakdown structure, task definitions and contractual requirements must be developed to ensure the integrity of the proposed logistic processes.

5.4 TAILORING

Since it is seldom possible to apply a detailed set of technical contract conditions as is, tailoring normally becomes necessary. The programme manager must prepare a first order set of technical conditions of contract based on this standard prior to issuing a Request for Proposal (RFP). The final tailoring of the technical conditions of contract must be agreed with the preferred CONTRACTOR. The separate parts of A-STD-61 are available in electronic format to assist with tailoring. Specific tailoring instructions are given in A-UMAN-0199.

The basic procedure for tailoring these sets of requirements is as follows:

- i. Select the part (i.e. Parts 1 to 7) of these sets of requirements that is most applicable to the programme and use it as a basis for tailoring.
- ii. Select those individual requirements that need to be upgraded/downgraded and replace them with the relevant requirements from the remaining parts (without change).
- iii. Update general or unique specifications, reporting frequencies and/or people responsible, if required (example : MIL-STD-756 for general components or MIL-STD-1543 for space systems, changing from monthly to two-monthly; replacing programme manager with quality assurance representative, etc.).
- iv. Update those requirements which need to be adapted for use in the specific CONTRACT.
- v. Add special requirements which are not included in the standard set of requirements.
- vi. which need to be adapted for use in the specific CONTRACT.
- vii. Add special requirements which are not included in the standard set of requirements.

6 DETAILED REQUIREMENTS

See Appendix 1 of Parts 1 to 7 for the detailed sets of standard CONTRACT conditions.

7 NOTES

7.1. PRODUCTS SYSTEM MANAGER

The term "Products System Management" replaced "Weapon System Management" since 1999 in the SANDF.



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7.2. DOCUMENTS APPLICABLE

Documents applicable only to certain Arms of the Service, e.g. RSA-MIL-STD-122 and RSA-MIL-STD-128 for the SA Army or RSA-MIL-STD-10 for the SA Air Force, are not referred to in parts 1 to 7 of the standard contract conditions.

7.3. MINIMUM REQUIREMENTS FOR SOFTWARE DEVELOPMENT

When tailoring contractual requirements for software development, minimum requirements as described in RSA-MIL-STD-8 must be adhered to.

7.4. MINIMUM REQUIREMENTS FOR INFORMATION SYSTEM INTEGRATION

When tailoring contractual requirements for logistics programmes the requirements for logistic data on systems must be adhered to and be compatible with the relevant information system requirements, e.g. SA Army products systems must conform to all input requirements for CALMIS as stipulated in SA ARMY order SAAO/GS4/02/011/99/1: Policy and Procedures for a minimum logistics programme in preparation of weapon system data.

7.5. GUIDELINES FOR TAILORING

Guidelines for tailoring of A-STD-61 for technology development are provided in the form of Annexures to Part 1, Part 2 and Part 3. Programme managers must select the part most relevant to the specific technology programme.

7.6. USAGE OF NAMES

When a CONTRACTOR subcontracts, using the technical contract conditions of A-STD-61, the name ARMSCOR must be replaced with the CONTRACTOR's own name.



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**APPENDIX 1:
CONTRACT CONDITIONS, TECHNICAL,
REFINING AN OPERATING BASELINE (OBL) FOR EXISTING SYSTEMS**



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1. GENERAL

1.1 APPLICABILITY OF DOCUMENTS

This document is tailored from ARMSCOR's standard for technical contract conditions.

Where any of these conditions are in conflict with any special terms, conditions, stipulations or provisions incorporated in any documents in the ORDER, the following order of precedence of documentation shall prevail:

- i. Special terms and conditions of the ORDER;
- ii. ARMSCOR's general conditions of CONTRACT (A-STD-0020);
- iii. Technical contract conditions, based on this standard;
- iv. RSA Military standards and directives;
- v. Other military standards and directives;
- vi. Other interpretive documents.

1.2 DOCUMENTS

The following documents, of the issue in effect on the date of request for proposal or as stated in the ORDER, form part of these conditions of the ORDER to the following extent:

1.2.1 Applicable Documents

Conformance required to the extent specified in the ORDER:

ACT No 6, 1983	Machinery and Occupational Safety Act
C ARMY/303/1/(WSM/98)	South African Army Manual for Weapon System Management
A-UMAN-014	Industrial Security Manual 2000
ISO 9001	Quality Systems - Model for Quality Assurance in Design, Development, Production, Installation and Servicing
MIL-STD-490	Specification Practices
MIL-STD-498	Software Development and Documentation
MIL-STD-961	Military Specifications and Associated Documents, Preparation of
MIL-STD-973	Configuration Management
MIL-STD-1369	Integrated Logistic Support Programme Requirements
MIL-STD-1388-1A	Logistic Support Analysis
MIL-STD-1388-2B	DOD Requirements for a Logistic Support Analysis Record
RSA-MIL-PRAC-175	Life Cycle Cost Management of Complex Systems, Practice for
RSA-MIL-SPEC-47	Item Information Requirements for Codification



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RSA-MIL-STD-3	Acquisition Baseline, Standards for
RSA-MIL-STD-176	Configuration Management, Standard for
RSA-MIL-STD-184	Configuration Management Plan, Preparation of
SAAO/GS4/02/011/99/1	Policy and Procedures for a Minimum Logistics Programme in Preparation of Weapon System Data Forms
DD 1376	Recommended Spare Parts List (RSPL)K217Modification Proposal
K225	Inspection/Release/Acceptance Certificate
K226	Inspection Rejection Note
K227	Concession (Waiver)
K228	Deviation Permit

1.2.2 Reference Documents

To be used as guidelines only - refer to Annexure B.

1.3 DEFINITIONS

The definitions in paragraph 4 of the main part of A-STD-61 are applicable.

1.4 ABBREVIATIONS

Refer to Appendix 2 for a list of abbreviations.

1.5 GENERAL NOTES

Where practical, different deliverable documents may be consolidated into one document to enhance cost-effectiveness. This note does not allow for any changes to contractual requirements with regard to contents or authorisation.

The CONTRACTOR can obtain contracted technical documentation from ARMSCOR where copyright is vested in ARMSCOR.

In subcontracting, the CONTRACTOR shall make the relevant technical contract conditions applicable. (Refer to paragraph 7.6 in the main part of A-STD-61).

2. PROGRAMME/PROJECT MANAGEMENT

2.1 ORGANISATION

2.1.1 Programme/Project Management Organisation

The CONTRACTOR shall, prior to commencement of work or as agreed upon with ARMSCOR's programme manager, establish and maintain a programme / project management infrastructure with:

- A clear ARMSCOR interface;



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- Single-point accountability and authority;
- Short communication channels; and
- Effective control capability.

This infrastructure shall be reconciled with the Contract Work Breakdown Structure (CWBS) agreed upon, using a responsibility matrix, which forms part of the relevant segment plans, and shall take cognisance of the fact that different skills are needed as the programme / project progresses through the different stages of the logistic engineering and support processes.

The CONTRACTOR's programme/project management infrastructure and his resources plan shall be disclosed to ARMSCOR's programme manager, prior to ORDER placement to ensure suitability and adequacy of the organisation to successfully execute the programme.

The CONTRACTOR shall, prior to ORDER placement, establish a staffing plan for key personnel for approval by ARMSCOR's programme manager. Curriculum vitae for key personnel shall be supplied to ARMSCOR's programme manager on request.

2.1.2 List of Major Subcontractors

The CONTRACTOR shall, prior to ORDER placement, compile and agree with ARMSCOR's programme manager on a list of all major subcontractors to be employed. The CONTRACTOR shall maintain an updated list of approved subcontractors.

This list shall be supported by a Statement of Work (SOW) which relates to the Work Breakdown Structure agreed upon.

2.1.3 Appointment of Personnel to Committees, Boards and Work Groups

The CONTRACTOR shall appoint capable and skilled personnel to committees, boards and work groups required for the proper execution of the ORDER.

2.2 PLANNING

2.2.1 Information for Summary Work Breakdown Structure

The CONTRACTOR shall on request supply sufficient information to ARMSCOR's programme manager for the development of a Summary WBS, see Figure 2 on page 31 for the minimum OBL establishment activities.

2.2.2 Contract Work Breakdown Structure (CWBS)

Using the relevant parts of the Summary WBS, the CONTRACTOR shall, prior to placement of ORDER, develop and agree with ARMSCOR's programme manager on the CWBS and, where applicable, the extended CWBS, using MIL-STD-881 and Figure 2 on page 31 as guidelines.

This CWBS shall form the basis for contracting, cost control, schedule control and technical control, and shall be maintained by the CONTRACTOR for the duration of the programme.



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Each task in the resulting programme CWBS shall be assigned a code that preserves and communicates the CWBS subdivision/summation logic.

2.2.3 Work Breakdown Structure (WBS) Dictionary and Statement of Work (SOW)

The CONTRACTOR shall use inputs from ARMSCOR's Summary WBS, specific requirements for logistic engineering, quality assurance and other technical inputs from the engineering process to establish:

- A WBS Dictionary, and
- A Statement of Work (SOW) based on MIL-HDBK-245.

The WBS Dictionary and SOW shall be prepared and agreed upon prior to placement of ORDER.

2.2.4 Plan Tree and Contract Data Requirements List (CDRL)

The CONTRACTOR shall submit, with his proposal, a plan using RSA-MIL-STD-57 as a guideline and shall develop, define and agree upon, as required by the ORDER, all plans which shall form part of the basis for contracting, controlling and reporting between ARMSCOR and the CONTRACTOR.

This plan tree shall be reconciled with the WBS and the plans identified in this plan tree, together with all other relevant documentation, shall be reflected in the Contract Data Requirements Lists (CDRL), using DI-A-23434 as a guideline.

2.2.5 Programme Master Plan (PMP)

The CONTRACTOR shall establish and maintain a programme master plan, using RSA-MIL-STD-57 as a guideline. The CONTRACTOR shall derive the relevant segment plans from his PMP. The segment plans shall be traceable in the plan tree and shall be based on the minimum OBL establishment activities (see Figure 2 on page 31). These plans are to be approved by ARMSCOR's programme manager according to the baseline agreed upon. The planning horizon for the segment plans shall be compatible with the Programme Master Plan, unless otherwise agreed upon.

The level of detail of planning for the phase to be contracted shall be provided by the CONTRACTOR to allow ARMSCOR effective control.

The CONTRACTOR's programme manager shall make visible all management reserves. These reserves shall be traceable to the identified risks and planning uncertainties.

2.2.6 Programme Report

The CONTRACTOR shall submit progress reports to ARMSCOR for all segments for which he is contractually responsible, at intervals as agreed upon, using RSA-MIL-STD-58 as a guideline. Such reports shall cover in detail, all aspects of the progress made and the problems encountered with the segment.

This report shall be the major review point for the segment plans and shall provide the necessary input and motivation to the relevant Configuration Control Board (CCB) if the plan is to be updated.



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2.2.7 Cost and Schedule Planning and Control

The CONTRACTOR's cost and schedule planning and control system shall make visible both the planned and actual costs involved with each work breakdown structure element, down to the agreed level of the WBS.

2.3 CONTROL

2.3.1 Establishment of Resource Management Control Systems

The CONTRACTOR shall, prior to ORDER placement, establish and agree with ARMSCOR's programme manager on control systems, using RSA-MIL-HDBK-56 as a guideline.

The control system shall at least:

- Relate costs, schedule and technical accomplishment to the plan and indicate the planned and expected completion costs, schedule and technical accomplishment for each WBS element;
- Be valid, timely, visible and auditable; and
- Supply ARMSCOR's programme manager with information at an agreed upon level of summarization.

2.3.2 Resource Management System Demonstration and Audit

Before placing the ORDER, the CONTRACTOR shall demonstrate to ARMSCOR's programme manager his resource management system, using RSA-MIL-HDBK-56 as a guideline.

ARMSCOR's programme manager shall have the right to request audits of the CONTRACTOR's resource management system.

2.3.3 Reporting

The CONTRACTOR shall establish and agree with ARMSCOR's programme manager on a monthly reporting system based on RSA-MIL-STD-58 as a guideline, which shall contain at least the following:

- Costs, schedule and technical performance against plan, as well as estimates at completion, to the level of the WBS agreed with ARMSCOR's programme manager;
- CONTRACTOR's programme manager's Management Summary;
- Major problems and corrective action plans; and
- Potential problems and risk reduction strategies.

2.3.4 Monthly Progress Meetings

The CONTRACTOR shall convene monthly progress meetings, scheduled in collaboration with ARMSCOR. The CONTRACTOR's programme manager, the segment managers for the programme and persons selected by ARMSCOR's programme manager (e.g. CLIENT



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and major subcontractors' representatives) shall attend these meetings.

The monthly progress report shall reach ARMSCOR at least four working days before the meeting date and shall be the basis for review at this meeting.

The CONTRACTOR shall be responsible for compiling and configuration control of the minutes of progress meetings. Such minutes of meetings shall reach ARMSCOR not later than 2 weeks after the meeting.

2.3.5 ARMSCOR's Representatives Facilities

The CONTRACTOR shall make available, to ARMSCOR's representative(s), if and when required at his own and/or his subcontractor's works:

- Suitable partitioned office accommodation conforming to the Environmental Regulations for Workplaces enacted in terms of the Machinery and Occupation Safety Act, Act No 6, 1983;
- Secure documentation storage facilities; and
- Equipment which is necessary for ARMSCOR's acceptance/formal testing and evaluation.

3. CONFIGURATION DEFINITION AND MANAGEMENT

3.1 GENERATION OF SPECIFICATIONS

Specifications identified in the specification tree for the system shall be generated in accordance with MIL-STD-961/ 490 or MIL-STD-498, and shall utilize the outputs of the system engineering process. Specifications shall be approved and presented for acceptance in accordance with the Configuration Management Plan. All specifications generated by the CONTRACTOR shall be traceable in the specification tree for the system.

The CONTRACTOR shall identify, define, document and control all documentation for which he is contractually responsible in accordance with MIL-STD-973 and RSA-MIL-STD-176. The CONTRACTOR shall develop system segment interface control documents, using DI-CMAN-81314 for hardware and DI-IPSC-81436 for software as a guideline, for approval by ARMSCOR's programme manager.

3.2 CONFIGURATION MANAGEMENT REQUIREMENTS

3.2.1 General

The CONTRACTOR shall be able to demonstrate prior to placement of the ORDER an integrated configuration management system conforming to MIL-STD-973 and RSA-MIL-STD-176, tailored to satisfy the requirements of the ORDER. (Guidance on the operation of a configuration management system is given in MIL-HDBK-61.)

ARMSCOR shall have the right to carry out periodic audits of the CONTRACTOR's configuration management system, including independent Physical and Functional Configuration Audits.



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3.2.2 Configuration Management Plan

The CONTRACTOR shall establish, implement and maintain a Configuration Management Plan, using RSA-MIL-STD-184, RSA-MIL-STD-176, MIL-HDBK-61 and MIL-STD-973 as guidelines. The CONTRACTOR's Configuration Management Plan must conform to the requirements of the programme's Configuration Management Plan. (Guidance on the content of configuration management plans is given in Tables A2 and A3 of MIL-HDBK-61.)

3.2.3 Baseline Management

The CONTRACTOR shall use the initial contracted baseline as the point of departure for configuration and change management.

The CONTRACTOR shall formalize and maintain a Master Record Index (MRI) using K-STD-0003 as a guideline from the initial baseline which shall include all applicable baseline documents listed in RSA-MIL-STD-3. The MRI shall be kept under configuration / change control.

3.2.4 Configuration Identification

3.2.4.1 Configuration Items

The CONTRACTOR shall identify configuration items (CI) for configuration management, for approval by ARMSCOR's programme manager.

3.2.4.2 Numbering System

The CONTRACTOR shall develop a numbering system, which shall be approved by ARMSCOR's programme manager, for the identification of configuration items and their corresponding documentation and which shall ensure configuration traceability. The ARMSCOR project number shall form part of this numbering system.

The CONTRACTOR's numbering system for configuration items shall be traceable to the relevant WBS and shall be documented in the CONTRACTOR's CMP.

3.2.4.3 Specification Tree

The CONTRACTOR shall develop a specification tree which shall relate to the WBS and plan tree.

The specification tree is to be agreed upon with ARMSCOR's programme manager and shall be completed as documented in the Configuration Management Plan.

3.2.4.4 Documentation Plan

For every CI, the CONTRACTOR shall establish a configuration identification in the form of technical documentation listed in a documentation plan, in accordance with RSA-MIL-STD-184.

3.2.5 Configuration Management Records and Reports

The CONTRACTOR shall maintain configuration records and reports as agreed upon with



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ARMSCOR's programme manager. Reports agreed upon shall be presented to ARMSCOR at agreed intervals and shall contain at least the following:

- A configuration change status report which contains full details of approval and implementation on all engineering changes, deviations and concessions (waivers); and
- An MRI indicating the full document detail and status.

3.2.6 Configuration Control

The CONTRACTOR shall control changes to approved baseline documents, including all CWBSs, specifications, plans and other formally released contract documentation, in accordance with MIL-STD-973.

3.2.6.1 Engineering Changes

The CONTRACTOR shall classify engineering change proposals (ECPs)/modification proposals into class I or class II in accordance with MIL-STD-973.

The CONTRACTOR shall submit, with sufficient supporting documentation, to ARMSCOR on form K217, or an agreed upon alternative, class I engineering change proposals for consideration and decision-making and class II changes for concurrence of classification.

3.2.6.2 Deviations

The CONTRACTOR shall classify all deviations as critical, major or minor in accordance with MIL-STD-973.

The CONTRACTOR shall submit to ARMSCOR on form K228, or an agreed upon alternative, classified deviations for consideration and decision-making (unless otherwise delegated).

3.2.6.3 Concessions (Waivers)

The CONTRACTOR shall classify all concessions (waivers) as critical, major or minor in accordance with MIL-STD-973. The CONTRACTOR shall submit to ARMSCOR on form K227, or an agreed upon alternative, classified concessions (waivers), for consideration and decision-making (unless otherwise delegated).

3.2.6.4 Configuration Control Board (CCB)

The CONTRACTOR shall establish a CCB qualified to advise the CONTRACTOR's programme manager. ARMSCOR's programme manager and Quality Representative shall be entitled to attend these board meetings.

The CONTRACTOR's CCB shall be responsible for:

- Reviewing and determining a need for change (unless the change originated from ARMSCOR);
- Determining total change impact;
- Approving submission of a change proposal to ARMSCOR, including Specification Change Notices (SCNs) and Interface Revision Notices (IRNs); and;
- Approving changes to subcontractors' controlled baselines and documents.



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Minutes of the CCB shall accompany all proposed changes.

3.2.7 Configuration Verification

The CONTRACTOR shall plan and agree with ARMSCOR's programme manager and execute formal configuration management audits in accordance with MIL-STD-973.

3.2.8 Security of Data

Handling and storage of data shall be in accordance with the ARMSCOR Industrial Security Manual, A-UMAN-014.

3.2.8.1 Archive

The CONTRACTOR shall maintain an archive for the storage and safekeeping of all formal documentation for a period agreed upon with ARMSCOR or as per law.

3.2.8.2 Physical Security

i. Documentation

The CONTRACTOR shall maintain a duplicate set of masters of all documentation at a secure remote site. The CONTRACTOR shall, at least once monthly, transfer a master of all new or updated documentation to the secure site.

ii. Computer Software

The CONTRACTOR shall maintain, at all times, at least three copies of all operating systems, utilities, compilers, application programmes, command and/or data files required for the operation of equipment.

The CONTRACTOR shall have a strategy in place to prevent loss of usefulness of computer software due to technology changes and ageing affecting the format of stored data or storage media.

3.2.9 Handover of Documentation to ARMSCOR

The CONTRACTOR shall retain masters of all documentation relating to the system developed by the CONTRACTOR until the date on which all CONTRACTOR involvement in any form whatsoever ceases or until otherwise instructed.

On that date, the CONTRACTOR shall hand over to ARMSCOR a complete set of all masters of documentation (including software) in a suitable medium acceptable to ARMSCOR.

4. RISK MANAGEMENT

4.1 FORMAL REVIEWS

The CONTRACTOR shall plan and conduct formal technical reviews, based on the OBL establishment activities, see Figure 2 on page 31.

ARMSCOR's programme manager reserves the right to include additional members of his choice on the Technical Review Board.



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4.1.1 Technical Review Agenda

Technical Review Agendas shall be prepared, using DI-ADMN-81249 as a guideline, and contain at least the item identification, date, location, time of review and individual topics being reviewed. This agenda shall be submitted to all parties involved at least 10 working days prior to the technical review.

4.1.2 Technical Review Data Package

The CONTRACTOR shall submit, together with the agenda, to all the members of the Technical Review Board, the relevant documentation at least 10 working days prior to the technical review.

4.1.3 Technical Review Meeting Minutes

The CONTRACTOR shall prepare and distribute minutes of technical review meetings, using DI-ADMN-81250 as a guideline, to all members of the Technical Review Board and other persons as may be deemed necessary and agreed upon with ARMSCOR's programme manager. These minutes shall be placed under configuration control and form part of the quality records required by paragraph 6.10.

The minutes shall at least include the following:

- Significant comments, findings and directions provided at the meeting, with rationale where appropriate;
- Decisions taken;
- List of data package contents;
- List of attendees;
- Action items with responsibilities and due dates; and
- List of presentation material.

4.2 RISK MANAGEMENT PROGRAMME PLAN (RMPP)

The CONTRACTOR shall prepare and maintain a Risk Management Programme Plan (RMPP), using RSA-MIL-HDBK-55 as a guideline, for submission to and approval by ARMSCOR's programme manager.

This plan shall describe programmatic aspects (intended actions) of risk identification, risk assessment, risk reduction and risk management functions to be performed by the CONTRACTOR.

4.2.1 Risk Abatement Plans (RAPs)

A Risk Abatement Plan (RAP) using RSA-MIL-HDBK-55 as a guideline shall be prepared for each high-risk item by the CONTRACTOR and be submitted to ARMSCOR's programme manager for review and approval, as each such risk is identified.

The plan and activities described in the RAP shall be implemented by the CONTRACTOR and monitored by a technical team, representing all disciplines involved in the logistic process.



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4.2.2 Risk Reduction Report (RRR)

The CONTRACTOR shall submit to ARMSCOR at agreed intervals an RRR for each medium or high risk item.

These RRRs shall report against the relevant RMPP and RAP and shall be prepared using RSA-MIL-HDBK-55 as a guideline.

5. INTEGRATED LOGISTIC SUPPORT ESTABLISHMENT

5.1 GENERAL ILS APPROACH

The CONTRACTOR shall develop and achieve a supportable and cost-effective system, using the integrated logistic support principles of MIL-STD-1369 as a guideline, and shall comply with the logistic support philosophy, policy and other guidelines supplied by ARMSCOR's programme manager.

The CONTRACTOR shall ensure that all decisions (e.g. the review of alternatives and engineering change proposals), take into account their impact on system effectiveness and life cycle cost, using the principles and processes described in RSA-MIL-PRAC-175, Section 4 and 5.

Figure 2 on page 31 illustrates the practical application of the ILS approach to support the minimum requirements of OBL establishment.

5.1.1 Engineering Principles

The CONTRACTOR shall optimize the ILS process by taking cognisance of engineering speciality principles, including inter alia:

- Reliability engineering;
- Maintainability engineering;
- Human factor engineering;
- Value engineering;
- System safety engineering; and
- Electromagnetic compatibility.

5.1.2 Standardisation

The CONTRACTOR shall use all standardisation opportunities - in the framework of the support concept - to ensure a cost-effective system for Products System Management.

5.1.3 Interchangeability and Compatibility

The CONTRACTOR shall ensure that items common to different products systems or subsystems are timeously identified and managed for interchangeability. This implies that the CONTRACTOR shall ensure that items and parts bearing the same number are fully interchangeable with regard to form, fit and function. Any assembly, sub-assembly



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module or part that requires setting up, re-aligning or matching to restore full system capability, shall be identified and clearly highlighted in technical and maintenance manuals.

5.1.4 Data Collection

The CONTRACTOR shall identify and maintain data collection processes to enable sound decision-making and to ensure the integrity of data defining an OBL.

NOTE

Complete and accurate data is essential for the development and rendering of cost-effective logistic support. When credible data is not available, inevitably assumptions, based on the best knowledge and experience, have to be made.

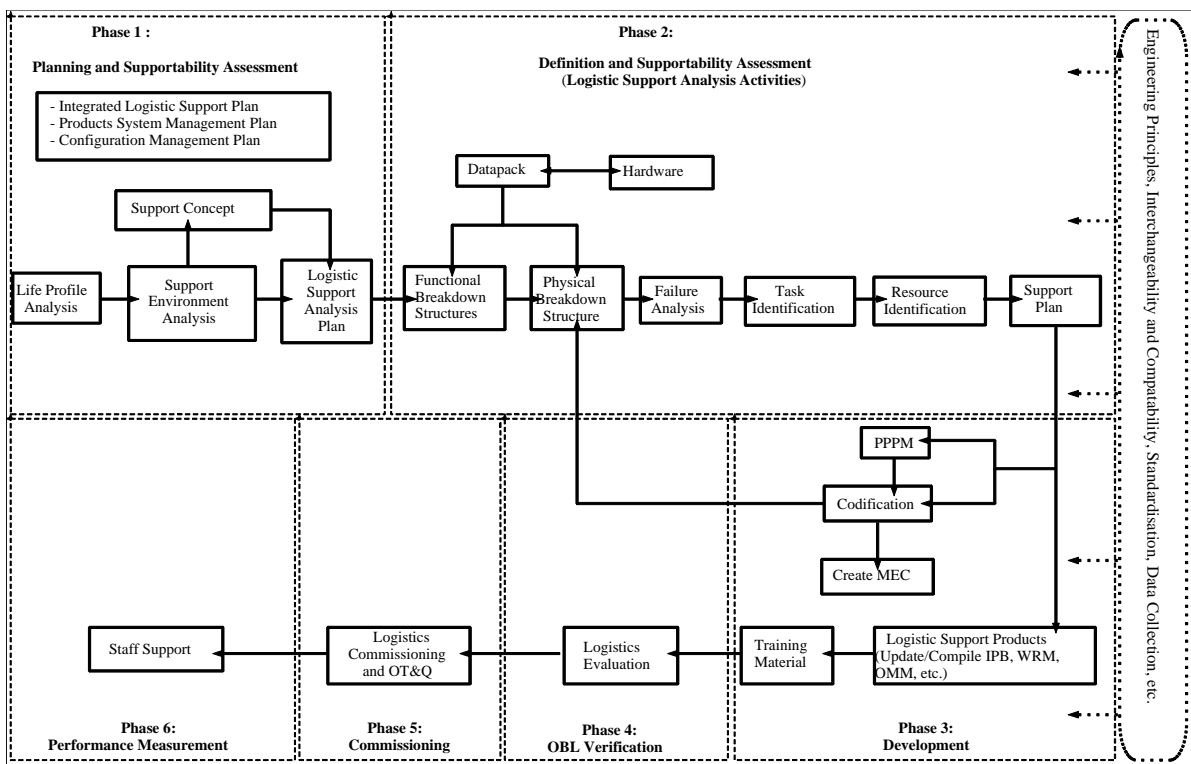


Figure 2: The minimum OBL establishment activities.

5.2 MINIMUM REQUIREMENTS FOR AN INTEGRATED LOGISTIC SUPPORT (ILS) PROCESS

Based on the formally identified product baseline (product data pack), the CONTRACTOR shall ensure that all the relevant engineering information required to operate and support the system is established in an Operating Baseline (OBL), in support of the products system during the Operating Phase.

Figure 2 depicts the minimum OBL establishment activities, aimed at identifying a process that will ensure that all the data required to establish the OBL is generated. (The activities



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as given are generic.) The work contents of each phase, needs to be tailored in scope and depth for the specific application by the Products System Management team supported by the relevant Staff Support Centre. A guideline for activities to be performed in preparation of products system logistic data is included in Annexure A ("Guidelines for activities to be performed during the OBL refinement process" see page 38).

5.2.1 Phase 1: Planning and Supportability Assessment

The activities that should be conducted as part of this phase are:

5.2.1.1 Integrated Logistic Support Plan (ILSP)

The CONTRACTOR shall develop an Integrated Logistic Support Plan (ILSP) in accordance with MIL-STD-1369. This plan shall be based upon the user's support concept.

5.2.1.2 Products System Management Plan (PSMP)

The Products System Management Plan documents planned Products System Management activities for the entire life span of the products system. The CONTRACTOR shall use the PSMP as framework for the planning of logistic activities.

5.2.1.3 Configuration Management Plan (CMP)

The CONTRACTOR shall on request supply sufficient information to ARMSCOR or the relevant contracted Staff Support Centre for the development of a CMP that will be implemented for ensuring the integrity of the baseline data through the whole life of the system.

5.2.1.4 Life Profile Analysis

The CONTRACTOR shall utilise the output of the system life profile - including mission analysis - as an input for the ILS process. This shall be done by conducting work sessions with the user or by evaluating user input, to utilise the expertise regarding the use of the system which resides with the user personnel.

5.2.1.5 Support environment analysis

The CONTRACTOR shall utilize available system data to perform or validate the support environment analysis in conjunction with the user, to determine the current and required:

- Levels of readiness/availability;
- Support concept and support problems;
- Codification status;
- Maintenance philosophy;
- Supply support policies;
- Training programmes;
- Management organisation/infrastructure;
- Contracting of functional processes; etc.



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5.2.1.6 Support concept

The CONTRACTOR shall develop or validate the support concept in conjunction with the user, to support the products system in the user environment as efficiently as possible.

5.2.1.7 LSA plan

The CONTRACTOR shall establish and maintain a Logistic Support Analysis Plan (LSAP) as part of their LSA planning activities. These activities shall be planned to satisfy the relevant Products System Management information system requirements, which are based on tailored requirements of MIL-STD-1388-1A and MIL-STD-1388-2B.

5.2.2 Phase 2: Definition and Supportability Assessment

5.2.2.1 Logistic Support Analysis Approach

The CONTRACTOR shall perform/adapt/upgrade (depending on the type of logistic programme), Logistic Support Analysis (LSA) in accordance with tailored MIL-STD-1388-1A processes to:

- Influence the system design where possible to obtain optimum supportability (front-end analysis);
- Identify the logistic resources; and
- Integrate with management information systems.

The CONTRACTOR shall perform LSA tasks as necessary to select an optimal solution to operational requirements throughout the life cycle, to establish cost-effective logistical support and to manage system life cycle cost (LCC) during the operating phase.

The outputs of the LSA shall be recorded as LSA Records (LSAR), which shall be in accordance with the tailored MIL-STD-1388-2B data fields as specified by the applicable Arm of Service, to satisfy the Products System Management information system requirements, e.g. as required by RSA-MIL-STD-74 for CALMIS for the SA Army.

The CONTRACTOR shall, at agreed intervals, provide progress reports on the generation of Logistic Support Analysis information required for each activity during the OBL establishment process.

5.2.2.2 Logistic Support Analysis Activities

The activities that should be conducted as part of this phase are:

- Breakdown structures (functional and physical) and data pack generation/verification;
- Failure analysis (e.g. FMECA);
- Task identification;
- Resource identification; and
- Support plan generation.

Refer to Annexure A, paragraph 2 for guidelines for activities to be performed during this phase.



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5.2.3 Phase 3: Development

5.2.3.1 Preparation, Preservation, Packaging and Marking (PPPM)

The CONTRACTOR shall develop methods and processes for the preparation, preservation, packaging and marking of items as derived from the maintenance concept and identified through the logistic support analysis.

5.2.3.2 Codification

The CONTRACTOR shall submit a report for ARMSCOR's consideration giving a Recommended Spare Parts List (RSPL) (DD 1376) of items to be codified in support of the system. These items shall be stocked or purchased. The item information for these items must be that of the original manufacturer.

The LSA, system architecture, other relevant engineering data and the proposed levels of support according to the support concept shall be used to motivate the items proposed.

All servicing equipment, spares and materiel as agreed upon with ARMSCOR for maintenance, including all associated equipment and items, shall be codified in accordance with RSA-MIL-SPEC-47, the National Codification System (NCS) and/or the NATO Codification System (NATOCS). The agreed equipment/spares and materiel shall be supported by the necessary documentation (i.e. product specifications, drawings, etc.).

Items shared between products systems shall be codified once only, fully taking into account other relevant products system's classification of A and E class items and the maintenance of a single point of responsibility for each item.

For items that have not been codified, the CONTRACTOR shall submit item information for codification with his quotation or as details become available.

5.2.3.3 Logistic Support Products and Training Materials

The CONTRACTOR shall generate or update logistic support products (IPB, WRM, OMM, TII, TSI, etc.) and training materials (instructor manuals, student workbooks, transparencies, models, software, etc.), based on the output of the LSA as documented in the LSAR.

5.2.4 Phase 4: OBL Verification

5.2.4.1 Logistics Evaluation

The CONTRACTOR shall supply to the verification team, on request, sufficient information to certify the integrity of the baseline. The accountability for the integrity of the LSAR remains with the CONTRACTOR. The CONTRACTOR must assure that adequate internal quality assurance activities take place. This must be performed by way of formal reviews in a phased approach to provide step by step assurance of the OBL establishment activities. The CONTRACTOR shall demonstrate the integrity of the process to the ARMSCOR Quality Representative.

The CONTRACTOR shall develop, with the ARMSCOR programme manager's approval, a logistic demonstration plan using MIL-STD-1369 as a guideline to verify the realism of logistic elements. This plan shall be integrated with the TEMP as far as possible.



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Refer to Annexure A, paragraph 4 for guidelines for activities to be performed during this phase.

5.2.5 Phase 5: Commissioning

5.2.5.1 Logistics Commissioning, Operational Test and Evaluation (OT&E) and Operational Test and Qualification (OT&Q)

The CONTRACTOR shall ensure that specific requirements with reference to CONTRACT deliverable logistic products are in support of and fulfil the requirements of the user's support systems and policies.

The CONTRACTOR shall render a support service to the Products System Manager aimed at verifying and correcting logistic data in the operational environment and preparing for the operational test and qualification, to confirm the OBL before transfer of responsibility from the project to the Products System Management environment.

NOTE:

Specific requirements concerning commissioning of products systems in the different Arms of Service are documented in the relevant Products System Management Manual for that Arm of Service. Products System specific requirements will be addressed in the commissioning plan for that products system.

5.2.6 Phase 6: Performance Measurement

5.2.6.1 Staff Support

The CONTRACTOR - in cooperation with the applicable Staff Support Centre, shall support the Products System Manager in the effective management of the products system to ensure the required operational readiness. The support may take various forms and shall be executed to the extent specified in the Products System Management plan e.g. providing management information by utilising and interpreting data provided by the Products System Management information system functionalities.

The CONTRACTOR shall maintain an integrated logistic support system for the establishment of future operating baselines for the products system.

6. QUALITY MANAGEMENT

6.1 CONTRACTOR'S QUALITY MANAGEMENT SYSTEM

The CONTRACTOR shall establish and maintain a Quality Management System and demonstrate its conformance to ISO 9001 before commencement of the CONTRACT.

ARMSCOR shall have the right to carry out periodic audits of the CONTRACTOR's management of quality, as well as specific product and CONTRACT audits.

6.2 QUALITY PLAN

The CONTRACTOR shall establish and maintain a Quality Plan, based on the OBL establishment activities. (See Figure 2 on page 31.) The Quality Plan shall be approved



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by ARMSCOR's programme manager and shall conform to the requirements of ARMSCOR's Programme Plan.

6.3 QUALITY REPORTS

The CONTRACTOR shall submit to ARMSCOR, in an agreed upon format, at intervals agreed upon with ARMSCOR's programme manager a report, containing:

- Management summary;
- System quality conformance;
- Process quality conformance;
- Level of conformance to ISO 9001;
- Outstanding corrective actions;
- Summary of latest internal audit reports; and
- Internal audit schedule plan.

6.4 RIGHT OF ACCESS

The ARMSCOR Programme Manager or persons designated by him shall have free access to all relevant sections of the place or places where work is performed to fulfil the requirements of the ORDER, for the purpose of conducting/witnessing any audits, inspections or tests.

6.5 ACCEPTANCE AUTHORITY

ARMSCOR shall be the acceptance authority in terms of the ORDER.

6.6 QUALITY OF SUPPLIES

The CONTRACTOR shall be responsible for all controls, reviews, audits, inspections and tests necessary to demonstrate the acceptability of all work covered by the ORDER.

6.7 ACCEPTANCE / FORMAL TEST AND EVALUATION

Acceptance/formal test and/or evaluation shall be undertaken at a venue agreed upon with ARMSCOR's programme manager. The CONTRACTOR shall notify ARMSCOR of such acceptance/formal test and evaluation dates at least five (5) working days or such periods agreed to, prior to the date of such acceptance/formal test and/or evaluation.

6.8 ACCEPTANCE

MATERIEL shall be accepted by ARMSCOR's programme manager or his representative by means of an Inspection Release Certificate (form K225) or an agreed upon alternative, once the following conditions have been met:

- Certificate of Conformance / Analysis has been issued providing objective evidence that the MATERIEL conforms to the requirements of the ORDER and has been controlled in terms of the quality plans as agreed upon. The certificates shall be issued and signed by an authorized representative of the CONTRACTOR as agreed upon with ARMSCOR's programme manager, and shall list all concessions (waivers) and deviations from the ORDER; and



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- ARMSCOR's programme manager or his representative has satisfied himself that the MATERIEL conforms to the ORDER.

MATERIEL which is found not to conform to specified requirements shall be rejected by means of an Inspection Rejection Note (form K226). The reasons for rejection and the requirements necessary for re-submission will be stated on the Inspection Rejection Note.

6.9 CORRECTIVE AND PREVENTIVE ACTION SYSTEM

The CONTRACTOR shall provide and maintain a corrective and preventive action system. The CONTRACTOR shall act promptly on corrective action requests issued by ARMSCOR.

6.10 CONTROL OF QUALITY RECORDS

The CONTRACTOR shall provide and maintain a quality record system. Quality records shall be maintained to demonstrate conformance to specified requirements and the effective operation of the quality system. Pertinent quality records of subcontractors shall be an element of this data.



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ANNEXURE A: GUIDELINES FOR ACTIVITIES TO BE PERFORMED DURING THE OBL REFINEMENT PROCESS

1 PHASE 1: PLANNING AND SUPPORTABILITY ASSESSMENT

The activities to be conducted as part of this phase include the following:

1.1 Integrated Logistic Support Plan

The ILSP contains all the management activities, responsibilities, timescales, etc. applicable to the definition, development and acquisition of logistic support leading up to the OBL establishment and the sustained support of the system during the operating phase.

The ILSP identifies the WHY, WHAT, HOW and WHEN of the preparation of the logistic elements and will describe at least the following elements:

- | | |
|-------------------------------|---|
| - Supply Support | Spares, repair parts, CFE, consumables, inventories and distribution channels |
| - Maintenance planning | Defining first and second line maintenance according to support concept |
| - Test and Support Equipment | Hardware and software for diagnosis, checkout and calibration |
| - PHS&T | Packaging, Handling, Storage and Transport |
| - Personnel and Training | Skill level definition, training aids and material, |
| - Facilities | Buildings, standard equipment and utilities for equipment maintenance and overhaul |
| - Publications | Technical Manuals for installation, checkout, operation, maintenance and modification |
| - Data and Computer Resources | Reliability and maintainability data, collection procedures, test and demonstration |

1.2 Products System Management Plan

The Products System Management plan provides the Products System Manager with a document in which all activities and responsibilities that should occur during the life-cycle of the system are captured - including project-unique requirements. It defines WHAT, WHY, HOW and by WHOM it will be done. It also defines the contracting between the integrative and functional management processes.

The Products System Management plan is in fact the equivalent of a System Engineering Management Plan for the operating phase of the system. It contains the following information:

- Definition of the products system;
- Consolidation of the products system requirements;



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- Definition /consolidation of the status quo/deviations;
- Life-cycle phase and planning;
- Products System Management vision and strategy;
- Products System Management principles, organisation, management/ contracting mechanisms, data, resources, macro plan, contingencies, MIS, etc.;
- A work breakdown structure of all ILS activities to occur during the entire life of the system, including planning, logistic support and staff support; and
- A responsibility matrix for all the activities in the minimum ILS process with allocated responsibilities to specific departments and individuals in the SANDF, ARMSCOR and the industry.

1.3 Configuration Management Plan

A configuration management plan must be drafted to document the configuration control process that will be implemented during all the programme phases. It must define the tasks, processes and responsibilities during the acquisition phase (engineering driven) and operating phase (support and cost driven). All baseline documentation and hardware configurations, will be placed under configuration control. Changes to equipment will be controlled with the aid of the management information system, keeping track of installed items per NSN, as well as the location of serial controlled items.

The following should be addressed:

- All CM activities necessary to ensure the integrity of the baselines through the progressive development of these baselines; and
- An integrated management approach to the control of changes to these baselines in terms of the engineering and logistic elements.

1.4 Life Profile Analysis

In order to establish/confirm the user's operational application requirements, all users will have to ensure the validity of their respective:

- Annual operating requirements;
- Readiness/Availability requirements;
- Mission requirements, including deployment/employment scenarios and short-medium and long-term vision and missions;
- Interfaces (functional/physical/managerial/environmental) with the system; and
- New acquisition strategy/plan (inputs required); etc.

This shall be done by conducting work sessions with the user or by evaluating user input, as the expertise regarding the use of the system resides with the user personnel.

1.5 Support Environment Analysis

A user support environment analysis shall be performed by conducting work sessions with the user or by evaluating user input to include at least all the elements listed in paragraph 5.2.1.5 of the technical conditions of contract.



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1.6 Support Concept

A comprehensive support concept shall be compiled for the system, integrating the management, maintenance and support elements/concepts applicable to the system. All the latest requirements from the SANDF Arm of Service, Products System Management Information System and supplier requirements must be taken into account to ensure that the system can be supported and maintained. This will involve the identification and trade-off of different support concepts to identify the most cost-effective solution that still satisfies the user requirements. For the execution of this work the eventual integration with the Products System Management Information System must be fully taken into account.

1.7 Logistic Support Analysis Plan

The LSA effort will use the applicable Products System Management information system requirements as guideline, which in turn are based on the requirements of MIL-STD-1388-1A and MIL-STD-1388-2B. Tailoring of the LSA tasks and data/elements must take place to suit specific project requirements. The following must be addressed in the LSA Plan:

- Tailored MIL-STD-1388-1A tasks;
- Tailored MIL-STD-1388-2B data fields;
- Identified MIL-STD-1388-2B reports necessary for the structured identification and approval of LSA results; and
- Identified procedures, timescales and responsibilities.

NOTE:

For logistic re-engineering exercises it is important that the original supportability parameters be reviewed with the end user to confirm validity, or in some cases they must be established for product systems that never formally defined these requirements.

2 PHASE 2: DEFINITION AND SUPPORTABILITY ASSESSMENT (LOGISTIC SUPPORT ANALYSIS ACTIVITIES)

2.1 Breakdown Structures and Data Pack Generation/Verification

The hardware of the system must be supported. For logistic re-engineering projects it is therefore important that a physical configuration audit be performed to ensure that the technical information pertaining to the hardware is correct. Any deviations will be highlighted and will have to be corrected by the relevant manufacturing contractor.

The functional breakdown structure of the system must be compiled based on the Main Equipment System Code requirements. This structure will be approved by the ARMSCOR Programme Manager based on the result of a formal design review, prior to the compilation of the physical breakdown structures. The maintenance and defect data are reported against the defined functional structures. The physical breakdown structures in turn will be used to create the hardware configuration structure of the system.

The hardware, data pack, functional breakdown structure and physical breakdown structure form the “technical baseline” for the development of the support for the system.

2.2 Failure analysis



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Failure analysis must be performed to sufficient detail in order to identify /motivate /confirm preventive and corrective maintenance tasks. This may be conducted based on the guidelines in MIL-STD-1629 (FMECA). The related MIL-STD-1388-2B data that is required for the successful generation of the management information system data requirements must be generated as a minimum.

Work sessions with the designers/manufacturers and/or operators/maintainers of the system must be conducted for inputs and approval of the results of the failure analysis.

2.3 Task Identification

Based on the results of the failure analysis, the removal, replacement and repair of items, as well as scheduled maintenance tasks, must be identified and allocated to the Level of Repair that provides the best balance between availability and cost-effectiveness. The allocation must be done according to the limitations as identified in the support concept. MIL-STD-1390 (LORA) may be used as a guideline.

Work sessions with the designers/manufacturers and/or operators/maintainers of the system must be conducted for inputs and validation of the results of task identification.

2.4 Resource Identification

During this phase of the analysis process, the detailed procedural steps for performing maintenance tasks will be identified/verified. This will be done in proximity to the system to ensure that all aspects are covered (e.g. all preliminary tasks, etc.). All the logistic element requirements will be identified and optimised, which will be used when developing the support elements for the system.

By being close to the system and physically verifying tasks on the system hardware during the LSA process, it is ensured that the first iteration outputs are as accurate as possible. The results will be captured in the LSAR. The resource identification will be done within the constraints of the support concept (e.g. maintenance work to be done by the Products System Management information system).

The identified spares and special tools will be scaled in terms of recommended quantities. The results from the life profile and mission analysis will be used as input.

Work sessions will be conducted with the designers/manufacturers and/or operators/maintainers of the system for inputs and validation of the results of resource identification.

2.5 Support Plan Generation

The support concept will be updated to become the support plan for the system. This is done based on the results of the support analysis. The support plan will define the support policy, maintenance levels, responsibilities and other pertinent support related issues.

3 PHASE 3: DEVELOPMENT

3.1 Preparation, Preservation, Packaging and Marking (PPPM)

Methods and processes for preparation, preservation, packaging and marking of items derived from the maintenance concept and identified through the logistic support analysis



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shall be developed in accordance with the unique requirements of the Products System Management system.

3.2 Codification

The relevant Arms of Service shall refer to their prescribed standards or procedures for codification requirements.

A list of recommended spares (DD1376) will be compiled from the LSAR in electronic format as required by the CLIENT. Items that will be used/maintained by the SANDF will be identified for codification/verification. Items that will not be used/maintained by the SANDF will not be codified. This DD1376 will form the basis for the codification to be done by a codification contractor. Main Equipment Codes (MECs) categorise main equipment into categories, families of categories and variants of families and will also be created as required. (Refer for example to SAAO/GS4/07/005/97/1: Technical Maintenance: The use of Main Equipment System Codes in the SA Army).

The CONTRACTOR shall:

- Ensure that screening of the items in the DD1376 against the information on NCS is done and that deviations are reported to the codification authority;
- Formally request that incorrect data on NCS is corrected; and
- Formally request and verify that items that have not been codified in the past are codified.
- Ensure that the results of the codification (NSNs) are incorporated in the LSAR.

3.3 Logistic Support Products and Training Materials

Logistic support products (IPB, WRM, OMM, TII, TSI, etc.) and training materials (instructor manuals, student workbooks, transparencies, models, etc.) will be generated or updated based on the requirements of the LSA as documented in the LSAR.

4 PHASE 4: OBL VERIFICATION (QUALITY ASSURANCE)

The LSAR forms the baseline for all the logistic element development that needs to be done. It is thus of vital importance that the LSAR data is complete and correct. By involving the designers/manufacturers and/or operators/maintainers from an early stage, the integrity of the data must be ensured.

Formal quality assurance of the data occurs in steps as the different analyses providing input data are completed. QA must be performed as an integral part of the process, e.g. at design reviews arranged by the CONTRACTOR. Validated data must be placed under configuration control. Further changes can only be accomplished via formal change control procedures. ARMSCOR QRs will participate in milestone reviews before formally accepting milestones. The accountability for the integrity of the LSAR remains with the CONTRACTOR. The CONTRACTOR must assure process integrity by adequate internal quality assurance activities.

At least the following aspects must be reviewed as part of the OBL establishment process:

4.1 Logistic Support Analysis Plan

Aspects that need to be addressed:



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- The specific requirements as stated in the Request for Proposal (RFP) are addressed (analyses, project data, management information system data, etc.); and
- The LSA approach addresses the requirements of the RFP in an effective manner.

4.2 Item Identification Data

(Not necessarily all contained in LSAR)

Aspects that need to be addressed:

- National Stock Numbers (NSNs) are in line with NCS;
- Item Name Codes (INC) are in line with NCS;
- Items to be serially controlled are in line with NCS;
- A and E class item identification conforms to programme requirements, is in line with NCS and in the case of items shared with other products systems, also in line with class designation of the products system considered to be the primary owner of the common item, i.e. where the control/management responsibility of the common item is vested;
- The NCS B-level structure is complete and correct; and
- Item accountability is established, required changes made to NCS and approvals given for import on the applicable management information system.

4.3 Functional Breakdown Structure (FBS)

Aspects that need to be addressed:

- FBS structure. (Complies with the requirements of RSA-MIL-STD-189 for SA Army products systems);
- MESD allocation requirements. (Refer for example to SAAO/GS4/07/005/97/1 Technical Maintenance: The use of Main Equipment System Codes in the SA Army);
- Correctness of data as required by the project LSAP; and
- Correctness of the functional/physical mapping.

4.4 Physical Breakdown Structure (PBS)

Aspects that need to be addressed:

- The structure is correct in terms of:
 - a. Breakdown;
 - b. Part Numbers and manufacturer/supplier codes;
 - c. Descriptions; and
 - d. Codified information.
- Data as required by the project LSAP is addressed and correct.

4.5 Failure Analysis and Task Identification



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Aspects that need to be addressed:

- Functions, failure modes, etc. are correct;
- Preventive and corrective maintenance tasks are identified and linked to failure modes;
- Level of Repair Analysis (LORA) is done and task codes are according to the approved LORA results; and
- Data as required by the project LSAP is addressed and correct.

4.6 Detail Task Analysis

Aspects that need to be addressed:

- The operator's tasks are identified;
- Preventive and corrective maintenance tasks are identified and linked to failure modes;
- Industry repair tasks on A class items are identified;
- Task codes are according to the approved LORA results;
- All primary and secondary task data are provided according to the LSAP;
- Resource identification and scaling are correct;
- All spares, special tools and human resources for maintenance operations and support of the system are identified; and
- Data to be populated in the required project data fields is addressed and reviewed for correctness.

4.7 Data Specification / MIL-STD-1388-2B Requirements

An aspect that needs to be addressed:

- The delivered LSAR data complies with tailored MIL-STD-1388-2B and project specific requirements, e.g. as identified in RSA-MIL-STD-74 for SA Army products systems.

4.8 ILS Elements

An aspect that needs to be addressed:

- The ILS elements are developed according to the LSAR data.

5 PHASE 5: COMMISSIONING

5.1 Establishment of OBL data on the Management Information System (MIS)

The relevant Staff Support Centre will establish the system data on the MIS, using the prescribed standards or procedures of the relevant MIS as well as the project specific requirements. The generic process is briefly summarised below.



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- 5.1.1 Once the LSAR is completed and formally accepted by ARMSCOR, a data/documentation package will be delivered to the relevant Staff Support Centre. This package will consist of:
- An export file of the LSAR (MIL-STD-1388-2B compatible) on an electronic data storage medium;
 - The Certificate of Conformance of the LSAR contractor;
 - An acceptance and release certificate (K225), issued by the ARMSCOR QR;
 - A QA report listing previous rejections and corrective actions taken, if applicable;
 - The forms on which changes in item accountability for common items have been agreed by respective Products System Managers;
 - The forms detailing the specific structures per serial number of the system/end item;
 - The forms detailing the exact location and status of each serial number of statutory as well as agency serial controlled items, and
 - The functional breakdown structure with UOCs and MESCAs as approved by the Products System Manager.
- 5.1.2 The ARMSCOR Programme Manager will submit these data/documents for configuration control to the appointed configuration centre and will attach the documentary proof of such submission to the data/documents. The LSAR is then submitted to the relevant Staff Support Centre together with the attached documents.
- 5.1.3 The relevant Staff Support Centre will perform data verification activities based on a checklist derived from the prescribed standards or procedures of the relevant MIS. The LSAR contractor must supply the means to access/view the LSAR data electronically (e.g. the LSAR software package used to compile the LSAR). The relevant Staff Support Centre will also conduct a data integrity evaluation (against previously approved baseline documents, e.g. FMECA report, LORA report, task analysis or other LSA documents) for which knowledgeable persons may be contracted.
- 5.1.4 After successful completion of the verification, the LSAR (baseline) will be frozen. No further changes to the data will then be allowed, either on the LSAR or on NCS until completion of the data import. The reason for this is to prevent the LSAR and NCS data from getting out of step. The completed verification report will be submitted to the Products System Manager for approval.
- 5.1.5 Once the Products System Manager has approved and signed the completed verification report, the CONTRACTOR can submit the LSAR data to be imported into the MIS. The relevant Staff Support Centre will generate an import results report that is forwarded to the Products System Manager. The LSAR delivery is only considered to be complete after its successful import into the MIS. NCS updates/changes may only then continue provided a sound configuration control system is adhered to.
- 5.1.6 Should the LSAR be rejected at any stage during the process, the whole process will be repeated. The LSAR contractor has to submit a corrective action report indicating details on previous rejections and corrective actions taken.



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5.2 Operational Test and Evaluation (OT&E) and Operational Test and Qualification (OT&Q)

The main purpose of commissioning is to make sure that the products system will meet the required operational capability. Qualification of the OBL requires a series of tests and demonstrations of the products system's operational and support capabilities in a representative operational environment.

As part of this phase, all the logistic elements must also be put in place at the respective points of maintenance. These include spares and consumables, test and support equipment, technical documentation and training of personnel. This phase is also the phase during which the final Operational Test and Evaluation of the products system occurs. This can only happen after the commissioning is complete. This takes the form of a test and evaluation of the system (including all newly commissioned logistic support products) under realistic operating scenarios and conditions for a predetermined period. The performance data gathered is evaluated against the user requirements and only once all requirements are met, the system will be regarded as fully qualified.

NOTE:

Specific requirements concerning commissioning of products systems in the different Arms of Service are documented in the relevant Products System Management Manual for that Arms of Service. Products System specific requirements will be addressed in the commissioning plan for that products system.

6 PHASE 6: PERFORMANCE MEASUREMENT

The content of this work element is programme-specific as prescribed by the Products System Manager and may take various forms. The work shall be executed in accordance with the Products System Management plan. This may inter alia include providing management information by utilising and interpreting data provided by the Products System Management information system functionalities and by participating in Products System Management forums.

This work shall provide the basis for the maintenance of an integrated logistic support system for the establishment of future operating baselines for the products system.



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ANNEXURE B: REFERENCES

DI-A-23434	List, Data Requirements
DI-ADMN-81249	Conference Agenda
DI-ADMN-81250	Conference Minutes
DI-CMAN-81314	System / Segment Interface Control
DI-IPSC-81436	Interface Design Description
K-STD-0003	Standaard vir MRIs
A-STD-0020	Armcor's General Conditions of Contract
MIL-HDBK-61	Configuration Management Guidance
MIL-HDBK-245	Preparation of Statement of Work (SOW) MIL-STD-881 Work Breakdown Structures for Defence Material Items
MIL-STD-1369	Integrated Logistic Support Programme Requirements
MIL-STD-1388-1A	Logistic Support Analysis
MIL-STD-1388-2B	DOD Requirements for a Logistic Support Analysis Record
MIL-STD-1390	Level of Repair Analysis
MIL-STD-1629	Procedures for Performing a Failure Mode Effects and Criticality Analysis
RSA-MIL-HDBK-55	Acquisition of Complex Systems, Risk Management, Guide for
RSA-MIL-HDBK-56	Acquisition of Complex Systems, Resource Management, Guide for
RSA-MIL-STD-57	Acquisition of Complex Systems, Planning Standards for
RSA-MIL-STD-58	Acquisition of Complex Systems, Reporting Standards for
RSA-MIL-STD-74	Logistic Support Analysis Record (LSAR) requirements for the SA Army; Standard for
RSA-MIL-STD-176	Configuration Management, Standard for
RSA-MIL-STD-184	Configuration Management Plan, Preparation of
RSA-MIL-STD-189	Main Equipment System Codes (SA Army)
SAAO/GS4/07/005/97/1	Technical Maintenance: The use of Main Equipment System Codes in the SA Army



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APPENDIX 2: ABBREVIATIONS

ABL	Allocated Baseline
CCB	Configuration Control Board
CDRL	Contractor Data Requirements List
CFE	Client-furnished equipment
CI	Configuration Item
CMP	Configuration Management Plan
COTS	Commercial Off-the-shelf
CWBS	Contract Work Breakdown Structure
DID	Data Item Description
ECP	Engineering Change Proposal
FBL	Functional Baseline
FBS	Functional Breakdown Structure
FMECA	Failure Modes, Effects and Criticality Analysis
ILS	Integrated Logistic Support
ILSP	Integrated Logistic Support Plan
INC	Item Name Code
IPB	Illustrated Parts Breakdown
IRN	Interface Revision Notice
LCC	Life Cycle Cost
LORA	Level of Repair Analysis
LSA	Logistic Support Analysis
LSAP	Logistic Support Analysis Plan
LSAR	Logistic Support Analysis Record



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MBL	Manufacturing Baseline
MEC	Main Equipment Code
MESC	Main Equipment System Code
MRI	Master Record Index
MIS	Management Information System
NATOCS	NATO Codification System
NDI	Non-developmental Items
NCS	National Codification System
NSN	National Stock Number
OBL	Operating Baseline
OMM	Operators Maintenance Manual
OSBL	Operational Support Baseline
OT&E	Operational Test and Evaluation
OT&Q	Operational Test and Qualification
PBL	Product Baseline
PBS	Physical Breakdown Structure
PMP	Programme Master Plan
PPPM	Preparation, Preservation, Packaging and Marking
PSMP	Products System Management Plan
PHS&T	Packaging, Handling, Storage & Transport
QA	Quality Assurance
QAP	Quality Assurance Plan
QR	Quality Representative
RAP	Risk Abatement Plan
RAS	Requirement Allocation Sheet
RFP	Request for Proposal
RMPP	Risk Management Programme Plan
RRR	Risk Reduction Report

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RSPL	Recommended Spare Parts List
SCN	Specification Change Notice
SOW	Statement of Work
SRBL	Statement of Requirements Baseline
TEMP	Test and Evaluation Master Plan
TII	Technical Inspection Instruction
TSI	Technical Service Instruction
UOC	Usable on Code
WBS	Work Breakdown Structure
WRM	Workshop Repair Manual