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Integrated Logistic Support Plan (ILSP)

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DOCUMENT CONFIGURATION CONTROL

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2.3	27 Jan 14	Contents	Page Number Corrections	D Lloyd
1.0	02 March 2015	All	Reset to version 1 for Contract Award	Fiona Bonehill

PGMU REFERENCES

REF	TITLE	DOCUMENT NUMBER AND ISSUE
A	URD	FNC 38272/37014r Issue 3 dated Mar 2013
B	SRD	FNC 38272/37153R Issue 3 dated Mar 2013

KEY PROJECT DOCUMENTATION

Ser.	REFERENCE NUMBER	TITLE
1.	Def Stan 00-40	Achievement of Reliability and Maintainability Part 1
2.	Def Stan 00-42	Reliability and Maintainability Assurance Guidance
3.	Def Stan 00-44	Reliability and Maintainability Data Collection
4.	Def Stan 00-45	Using Reliability Centred Maintenance to Manage Engineering Failures
5.	Def Stan 00-49	Reliability and Maintainability MoD Guide to Terminology Definitions
6.	Def Stan 00-56	Hazard Analysis and Safety Classification of the Computer and Programmable Electronic System Elements of Defence Equipment
7.	Def Stan 00-250	Human Factors for Designers of Equipment
8.	Def Stan 00-600	Integrated Logistic Support Issue 2
9.	Def Stan 01-5	Fuels Lubricants and Associated Products
10.	Def Stan 05-55	Measurement and Calibration System Requirements for Ministry of Defence Test and Measurement Equipment
11.	Def Stan 05-57	Configuration Management Policy and Procedures for Defence Material
12.	Def Stan 05-61	Quality Assurance (QA) Procedural Requirements
13.	Def Stan 05-129	Contractors on Deployed Operations (CONDO) Processes and Requirements
14.	Def Stan 25-24	Health and Usage Monitoring
15.	Def Stan 59-411	Electromagnetic Compatibility
16.	Def Stan 66-31	Basic Requirements and Tests for Electronic and Electrical Test and Measurement Equipment
17.	Def Stan 81-41(Part 6)	Packaging of Defence Material: Marking and Labelling
18.	Mil Std 461	Electromagnetic Compatibility (EMC) (EEC Directive 89/336/EEC)
19.	Mil Std 1472	Human Engineering Design Criteria for Military Systems, Equipments and Facilities
20.	Mil Std 1629	Failure Mode, Effect and Criticality Analysis (FMECA)
21.	Mil Hdbk 502	Acquisition Logistics
22.	Mil Hdbk 46855	Procedure for Human Engineering Requirements for Military Systems, Equipments and Facilities
23.	DEFCON 82	Special Procedure for Initial Spares
24.	DEFCON 117	Supply of Documentation for NATO Codification Purposes
25.	DEFCON 697	CONDO
26.	BS 4884	Technical Manuals
27.	BS 5499-5:2002	Safety Signs and Covers
28.	BS 5958-1:1991	Code of practice for control of undesirable static electricity
29.	BS EN 60068-4:1996	Environmental testing. Information for specification writers. Test summaries

30.	BS EN 62402:2007.	Obsolescent Management – Application Guide
31.	BS 9000	General Requirements for a System for Electronic Components of Assessed Quality
32.	STANAG 1414	Guidelines to Ensure That Contractors Design and Supply New Equipment Capable of Using Standardized Lubricants
33.	STANAG 2828	Military Pallets, Packages and Containers
34.	STANAG 2829	Edition 3 Amdt 2: Materials Handling Equipment
35.	STANAG 3150	Codification - Uniform System of Supply Classification
36.	STANAG 3151	Codification - Uniform System of Item Identification
37.	STANAG 4280	NATO Levels of Packaging
38.	JSP 317	Safe Storage & Handling of Fuels & Lubricants
39.	JSP 335	Dangerous Air Cargo Regulations
40.	JSP 375 (Vol 1&2)	Application of Health and Safety at Work Act
41.	JSP 430	MoD Ship Safety Management
42.	JSP 440	Manual of Security
43.	JSP 509	Catalogue of GPTME
44.	JSP 543	Defence Technical Documentation – Policy and requirements
45.	JSP 567	Contractor Support to Operations
46.	JSP 602	Interoperability of Information Systems
47.	JSP 800	Defence Movement & Transport
48.	JSP 822	The Defence Manual of Training Management
49.	JSP 886	The Defence Logistics Support Chain Manual
50.	ASD S1000D	International Specification for Technical Publications

1 PREFACE

1.1 INTEGRATED LOGISTIC SUPPORT

Integrated Logistic Support is a management discipline that enables:

- The best Reliability and Maintainability and hence Availability to be achieved at an optimum life cycle cost.
- The design or selection of a product to be influenced by support considerations.
- The identification and procurement of the most suitable support for a product.

1.2 Product/System Description

The scope of PGMU comprises 4 key equipment areas (4 lots) as follows:

- **Lot 1 - Diesel Generators.** [redacted]
- **Lot 2 - Power Conversion Equipment (MG Sets).** [redacted]
- **Lot 3 - Electrical Distribution System.** [redacted]
- **Lot 4 - Machinery Control and Surveillance System (MCAS).** [redacted]

It should be noted that the contractor responsible for each Lot will be required to integrate his solution with the other Lots within the PGMU. The additional Integration role is to be undertaken by the Lot 5 Contractor on behalf of the Authority to deliver PGMU functionality and to detail and manage the interfaces between the integrated PGMU equipments with the platform services and systems.

[redacted]

Central to all MOD procurement is the need to be affordable. A consequence of this is the assertion that PGMU is an update project that seeks to replace like-for-like capability. Whilst improvements in capability are expected in some areas due to the replacement of old technology by newer systems, outright improvements are not funded. However, the project is expected to consider every opportunity to leverage advantages during the update process and Contractors are encouraged to propose solutions that illustrate where added value can be achieved.

A common threshold Measure of Performance (MOP) throughout the System Requirements Document (SRD) is "No worse than the current capability" which does not constrain the solution to being exactly equal to the current capability but enshrines the intention of update rather than upgrade. Similarly, many system requirements lack an objective MOP because an update project is not funded to provide more capability than the threshold acceptable level.

The priorities of system requirements were devolved from the User Requirements Document (URD) where applicable and confirmed during stakeholder workshops. Arguably, any trading out of requirements in an update project would lead to a degradation of capability. However, another consequence of the centrality of affordability is that trading of requirements is still a possibility.
The interfaces between the PGMU project and the T23 ship's systems are shown in Figure 1. The equipment contained within the PGMU boundary is shown in Figure 2.

Figure 1 – PGMU Equipment Interface Diagram

Figure 2 – PGMU Equipment Boundary Diagram

[redacted]

The four DG sets will be installed in two compartments:

[redacted]

1.3 ILS STRATEGY

Def Stan 00-600 (Integrated Logistic Support Requirements for MOD Projects) identifies the MOD

requirements for the application of Integrated Logistic Support to the procurement of systems and equipment. All ILS activities undertaken as part of this procurement process must meet the tailored requirements of Def Stan 00-600. ILS Element plans and in particular Supportability Analysis (SA) activities must be co-ordinated across the breadth of the Project to prevent duplication and to ensure that, where possible, the optimum support arrangements are identified. The Restricted Procurement strategy and the selection of Commercial off the Shelf/Military off the Shelf (COTS/MOTS) equipment limits the opportunity for support considerations to influence design. Where design freedom exists, ILS will be used to ensure support is considered during the design process. Where no design freedom exists, ILS will be used to evaluate the supportability of the systems proposed.

The overall ILS strategy for PGMU is to concentrate on:

- Tailoring the ILS activities to achieve a cost effective ILS programme appropriate to existing systems and COTS based technology;
- Optimising the design of PGMU and its support to achieve and sustain the required availability at minimum Whole Life Cost (WLC);
- Achieving the Logistic Support Date (LSD) for PGMU on time and to cost;
- Establishing a robust framework for the in-service management of PGMU.

All ILS activities undertaken as part of this procurement process will comply with the requirements of Def Stan 00-600 except where specific exclusions are detailed.

The Acquisition Operating Framework (AOF) Support Solutions Envelope (SSE) contains support policy that is considered critical for the MOD Project Team (PT) to consider when developing a Support Solution. The PT is required to demonstrate to the Through Life Support Improvement Team, as part of the Project Review and Assurance process, how its Support Solution proposal provides best value for money and is coherent and consistent with Defence logistics polices. Innovation is encouraged, although thought should be given to current and emerging military doctrine and justification must be given if solutions are proposed that digress from the SSE.

The adoption of ILS and SA methodologies as defined in Def Stan 00-600, adds a more formal structure to achieve the objective of influencing the design, by defining a step by step analysis of the support implications within a design process. In addition, it provides the infrastructure to enable the efficient management of the support data in a structured and controlled manner. The application of ILS enables the requirements of the upkeep and support strategies to be more easily and cost effectively achieved through a structured supportability assessment.

The Authority and the Contractor will work together to mature the PGMU support solution.

1.4 Integration with Existing Support Strategies

This section provides details of planned and existing support arrangements that will have an impact of the PGMU support strategy.

1.4.1 Surface Ship Support (Alliance) (SSS(A))

Support Provision. The overall intention is that PGMU will be delivered as an inherent part of the overall Surface Ship Support (Alliance) (SSS(A)) solution for the T23 fleet. The SSS(A) will be responsible for the cost effective delivery of the overall PGMU support solution. Whilst the Alliance arrangements may evolve between now and PGMU entering service, the PGMU project will proceed on the basis that the SSS(A) remains in its current form. Hence, for PGMU the following key assumptions are made:

a. The current T23 Class Output Management (COM) team will continue to support PGMU.

b. BAE Systems (through the Terms of Business Agreement (TOBA)) will be the lead manager of PGMU under the T23 COM arrangement, whilst planned maintenance (whether that be an Upkeep period or during Fleet Time Support periods) would be undertaken by either:

- BAE Systems
- Babcock Marine (BM)
- Combination of BAE Systems and BM

c. The MOD Electrical Systems Group (ESG) and Diesels Engine Group (DEG), within Maritime Platform Systems (MPS) Team will undertake the Strategic Equipment Authority (SEA) and the Equipment Manager (EM) functions for all PGMU equipment except where they agree different arrangements such as those currently under consideration by the Maritime Equipment Transformation (MET) initiative. Upon entry into service, it is intended that PGMU systems and equipment will be supported through the SEA and EM processes prevailing at the time unless the ILS studies point to other bespoke arrangements as delivering better and compelling Value for Money (VfM).

1.4.2 Maritime Support Delivery Framework (MSDF)

The MSDF is the programme that will replace and integrate 12 maritime contracts with BAE Systems Maritime Naval Ships and Babcock Marine and Technology.

The other strategic arrangements that govern MSDF scope, such as the SSS(A) will continue to exist to drive business transformation and performance at a strategic level.

It is assumed that at some stage in the future, the MSDF will feature in aspects of PGMU support. It is also assumed that there will remain aspects of support of PGMU that will fall outside the scope of MSDF and will require contracting out to Original Equipment Manufacturers (OEMs).

1.5 Input into Project Approval

ILS activities for PGMU are detailed in the Statement of Work (SOW) and the measures of effectiveness and targets for ILS requirements are specified in the System Requirements Document (SRD). This will ensure that the sustainability of the equipment at sea is considered within any response to the Invitation to Tender (ITT) for each PGMU Lot. This ILS Plan will be updated and assessed as an integral part of the Main Gate Business Case.

1.6 ILS Documentation

The documents detailed in the Key Project Documentation on page 8 will be used in the management of ILS for this project. Documents may be contractual or for information purposes only. Unless clearly indicated as contractual, nothing within these documents should be interpreted as a change to the contractual requirements.

2 Integrated Logistic Support Plan

The MOD Logistic Support strategy focuses on the supportability of the design of the product/system and its integrated equipment and services, particularly those which are mission essential.

2.1 Aim

The aim of this Integrated Logistic Support Plan (ILSP) is to:

- Identify and document the PGMU logistic requirements and constraints.
- Describe the required logistic actions, tasks and milestones.
- Ensure that all relevant ILS elements and tasks are considered.
- Establish responsibilities for ILS programme participants.

2.2 ILS Objectives

The Logistic Support effort for PGMU has the following objectives:

- To ensure logistic support considerations are included in the PGMU solution proposals on an equal weighting with design, performance and cost;
- To ensure the programme plans are in place to achieve logistic support for the equipment/platform at optimum Whole Life Cost (WLC);
- To identify and integrate the various support element plans that provide a co-ordinated approach which integrates with the existing DE&S procedures;
- To satisfy the Authority's intention that PGMU and its associated systems/equipment will be maintained during the in-Service stage and that the required support infrastructure will be determined and delivered.

2.3 Scope

The scope of this ILSP applies to support for all mission essential products, systems, associated peripherals, software, support and test equipment, standard and special tools, training, documentation, handbooks, manuals and GFA for the D&M and in service phases of the project.

The purpose of this ILSP is to describe how the Authority intends to manage the PGMU ILS programme. It outlines the activities to be conducted by the Authority and Industry.

The ILSP is the Authority's statement of the total ILS programme for the project. It is the implementation plan for logistic support and its scope includes the ILS requirements and constraints, tasks, ILS elements, interfaces and milestones for the current phase and plans for the succeeding phases.

It details the responsibilities and resources for the implementation of the ILS tasks and provides all necessary support inputs to other project documents and papers and contains, or refers out to, supportability aims, support strategy and all associated plans.

The PGMU ILS programme is not a stand alone activity; it has to be closely tied to the PGMU design process to assure relevancy of the proposed support system to the proposed equipment fit.

2.4 Content

This plan describes the overall management of the PGMU ILS effort and identifies and outlines the activities to be undertaken by the Authority and Industry during the Demonstration, Manufacture, In-Service and Disposal stages of the PGMU life cycle.

This plan provides direction as to the full spectrum of ILS documentation and processes to be conducted during the PGMU programme. It covers all aspects of ILS and will, where applicable, refer to master documents in domain specific areas such as Availability, Reliability and Maintainability (AR&M), Training and Supportability Analysis (SA).

2.5 Iteration

This plan will be updated as the PGMU project progresses through its life-cycle. The ILSP will also be updated when significant changes require such an update.

The vision is of a PGMU system that has:

- high levels of reliability and operational availability;
- reducing support resource requirements through-life;
- a smaller logistic footprint to sustain the required operational effect;
- a flexible and scalable, SSE compliant, support solution provided in partnership with Industry.

2.6 Supportability Vision

Over the longer-term, the goal is to establish in-service a highly dependable capability that is affordably sustained by a flexible and comprehensively managed system of support with a reduced logistic footprint.

In the medium term, the goals are to ensure adequate support during the transition into service of the updated PGMU capability, and also to identify and address shortfalls in support from early in-service experience. The emphasis will be to improve and optimise (for cost and effectiveness) the maturing support solution based on lessons from the initial support provided.
In the shorter-term, the main effort is to ensure supportability and support requirements are achieved and that the timely integration of capability and introduction into service is supported by an effective initial support package.

In the immediate term, the focus is on:

- Influencing design/selection to enable a supportable system and cost-effective support solution to be designed (in terms of WLC);
- Identifying and developing the support resources requirements;
- Acquiring the appropriate support resources;
- Integrating the elements of support to provide a cost-effective support solution.

2.7 ILS Requirements

Specific ILS requirements are detailed within the SRD [Reference B]. Reference should also be made to the technical requirements specified in the General Technical Requirements (GTR) document and the Technical Equipment Specification (TES) for the applicable Lot.

2.8 SUPPORT STRATEGY

The Support Strategy adopted is to seek, through the ITT for each PGMU Lot, a period of Initial Support as a core part of the contract for each PGMU Lot with a request for options relating to the extension of the initial Support period for a further 5 years. The tender responses will then be assessed on a Value for Money (VfM) basis against extant arrangements. The aim is to support PGMU in the most efficient manner whilst reducing Through Life Finance (TLF) and achieve best VfM to Defence.

The support solution for PGMU will comply with the headmark statement below which has been endorsed by Chief Staff Officer (Engineering) (CSO(E)).

2.8.1 FLEET Headmark Statement

2.8.2 Design for Support

Whole Life Cost (WLC) (and the support costs within it) will be taken into account appropriately in Performance Cost and Time (PCT) trading and in all design and equipment selection decisions.

2.8.3 Support Solution Development

The PGMU Support strategy will be implemented in accordance with the policies and principles laid down by the Defence Standard (Def Stan) 00-600 with guidance detailed in Joint Service Publication (JSP) 886. The Authority has produced User and System requirements and the Statement of work (SOW) issued with the PGMU ITT for each Lot. The

intention is that the equipment OEM will be contracted to develop and deliver the optimum support solution for PGMU, including options for Contractor Logistic Support (CLS). The OEM will be responsible for the majority of the Supportability Analysis and modelling and will therefore assume the majority of the support risks, whilst the Authority will retain the Operational risks.

2.9 CONTRACTOR LOGISTIC SUPPORT

The Authority's intention is that support for PGMU will be established through a mix of organic and CLS support. The Contractor shall propose against the options for CLS outlined in the SOW and described below, including a 2½ year period of interim support with options to extend the interim support period for a further 5 years.

2.9.1 Warranty

The Authority's Warranty requirements are detailed within the SOW issued for each PGMU Lot.

2.9.2 CLS Planning

The Authority's requirements for Interim Support and CLS Options are detailed within the SOW issued for each PGMU Lot.

2.9.3 CLS Monitoring

The Contractor is to propose the method of measuring the performance of the CLS service, to achieve the contractual Key Performance Indicators (KPIs), including what will be measured and how the data will be gathered.

2.9.4 Reporting

During the operation of the CLS service, the Contractor shall report monthly on the following:

a. Monthly activity
b. Spares inventory
c. MTTR analysis and figures
d. R&M trend analysis
e. Spares availability
f. No fault Found (NFF) data

2.9.5 Configuration Management

The Contractor shall undertake configuration management of the equipment, spares and the related data for the duration of the CLS contract, in accordance with the Contractor's Configuration Management Plan (CMP).

2.9.6 Obsolescence Management

The Contractor shall undertake obsolescence management of the equipment and spares supplied to the Authority for the duration of the Interim Support Period, in accordance with

the SOW and the Contractor's Obsolescence Management Plan (OMP) and Software Obsolescence Management Plan (SOMP).

2.9.7 Commencement, Duration and Scope of Support

The duration and scope of Contractor support during the Interim Support Period and the CLS options are detailed in the SOW. The Contractor should include their response to these requirements in their ISP.

2.9.8 Repair Exclusions

The Tender shall state any repair exclusions which fall outside of the scope of the routine CLS service (e.g. No fault found (NFF)). It is expected that the contractor should offer to undertake repair or replacement of such equipment upon the agreement of the Authority.

2.9.9 Maintenance Planning

The Contractor shall be required to quantify the scope of work to be undertaken as part of the CLS service. This shall include:

a. The number of repair actions (arisings) that will occur.
b. The items/Line Replaceable Units (LRUs) that are to be returned to the Contractor for repair.
c. The Contractor's plan to cope with surge requirements.

2.9.10 Corrective Maintenance

The contractor shall provide a repair service for all LRUs returned.

LRUs/items requiring repair shall be removed by trained operators or maintainers at the equipment operating location and returned to the contractor's premises.

All returned items shall be accompanied by a fully completed Equipment Failure Report (EFR).

The contractor shall inspect and test all items upon receipt.

Incomplete items or items deemed to fall within repair exclusions shall be quarantined pending agreement with the Authority on the status of the failed item.

In the case of repairs considered to be excluded from the CLS liability, the contractor shall provide the Authority with a Firm Price quotation and time estimate for the completion of the repair action.

Upon receipt from the Authority of authorisation to commence work, the contractor shall undertake repairs in the normal manner.

Items within the provision of the CLS contract shall be either replaced or repaired.

The decision to repair or replace an item shall lie solely with the contractor or its selected suppliers based on operational effectiveness and economic considerations. Where an item is sentenced "Beyond Repair" or "Beyond Economic Repair" a complete replacement provided to the customer.

2.9.11 Technical Documentation

Amendment of technical publications arising from errors shall be included as part of the CLS contract.

2.9.12 Support and Test Equipment

The repair and maintenance (including calibration) of any Support and Test Equipment (STE) supplied shall be included in the CLS service.

2.9.13 Supply Support

The contractor shall maintain, at its sole discretion, sufficient spare LRUs and/or spare parts as required to ensure the specified repair Turn-around-Time (or operational availability) can be achieved.

In addition to parts used in the repair of equipment returned for 4th Line repair, the contractor shall supply on demand all 1st Line spares and consumables required to effect Level 1 and Level 2 maintenance.

2.9.14 Packaging, Handling, Storage and Transportation (PHS&T)

All equipment returned to, and from, 4th Line repair shall be packaged at the appropriate levels. Special to Contents Containers (STCC) will be asset managed and be included as part of the CLS contract.
The contractor shall be responsible for the return of repaired equipment to the customer's location(s).

2.9.15 Disposal

All items requiring disposal may be returned to the contractor for disposal in accordance with existing company arrangements for disposal of materials.

2.9.16 Post Design Services (PDS)

The contractor shall collate and analyse all EFRs to identify failure trends. In the event that a trend is identified, the contractor shall investigate the cause and propose remedial action to the customer.

2.9.17 Definitions

A **Failure** is the termination of the ability of the equipment, or any item of the equipment, to perform its intended function and which prevents the use of the whole or part of the equipment.

A **Fault** is defined as any non-conformance of equipment to one or more of its required performance parameters, which requires unscheduled corrective maintenance, whether or not a failure would result.

2.10 ILS ORGANISATION

2.10.1 MOD ILS Manager (MILSM)

The MILSM for PGMU [redacted] who is responsible to the Programme Manager for the overall planning and execution of all Supportability Engineering actions related to the acquisition of PGMU.

The MILSM will ensure timely planning and action in a co-ordinated and economic manner and will define the actions and activities required to produce a tailored ILS programme composed of the basic elements of ILS. The MILSM provides a focal point for the ILS programme elements for the Contractor's ILS Manager and the various Sub-Contractors.

The MILSM is accountable to the PGMU Team Leader for the effective development of

robust, costed support solutions. Responsibilities include:

- Developing an effective supportability strategy for PGMU in line with current and emerging DE&S Support Strategies;
- Effectively influencing the PGMU System Solution to ensure that Supportability aspects are appropriately reflected;
- Providing a focal point within the Team for all supportability matters;
- Interfacing with all stakeholders as necessary to ensure that Supportability matters are tackled, understood and agreed as appropriate;
- To provide Project input on all ILS and Training issues;
- Influencing the PGMU design to take account of supportability constraints, risks and opportunities;
- Interfacing between the Team, the User and other relevant stakeholders to ensure that Supportability issues are fully understood and, where necessary, agreed;
- Developing and delivering the PGMU ILS Strategy to include innovative approaches where appropriate in line with current DE&S support strategies.

Supportability encompasses the following support streams:

- Integrated Logistic Support (ILS);
- Supportability Analysis (SA);
- Reliability and Maintainability (R&M);
- Training.

2.11 Contractor ILS Organisation

The principles of ILS will be applied to all aspects of the PGMU programme. The Contractor shall, through their ISP and Supportability Analysis Plan (SAP), demonstrate their commitment to, understanding of, and approach to ILS, placing emphasis on how their proposed ILS programme fits into the overall programme.

The Contractor shall state the Company policy on ILS and describe how the policy shall be implemented.

The Company's ILS organisational structure shall be described covering each element within ILS. An organisational diagram shall support the description identifying the relationship to other disciplines within the overall Company organisation. The Contractor's ILS organisation will serve as a key indicator of their commitment to developing a fully supportable and sustainable PGMU system.

The Contractor shall propose the interfaces between the ILS Teams of the Contractor and the Authority.

The Contractor shall assign a Contractor ILS Manager (CILSM) for the PGMU programme who will liaise closely with the MILSM. The Terms of Reference (TORs) for the ILS Manager shall be provided as part of the ISP submitted with the Tender response.

2.12 ILS Programme

2.12.1 LOGISTIC SUPPORT DATE (LSD)

The LSD is the date from which the User will require logistic support. PGMU will not be accepted into service unless the LSD has been declared as successfully achieved. A Supportability Test, Evaluation and Validation activity will be conducted in order to confirm the requirements have been met.

2.13 ILS MILESTONE SCHEDULE

The ILS activity milestones which will need to be achieved prior to the In Service Date (ISD) are listed in the table below.

Activity	Completion Date/Period
Determination of Logistic Support Resources	Contract Award + 6 months
Procurement of Logistic Support Resources (including setting up of CLS contract)	Prior to LSD
Installation (First of Class)	commences at Non Fleet Date (NFD) for FoC
Logistic Support Date (LSD)	SAT(ME) FoC minus 3 months
In-Service Date (ISD)/ Initial Operating Capability (IOC)	Fleet Date (FD) for FoC

2.13.1 ILS Statement of Work

The Statement of Work (SOW) is a contractual document. It describes the activities that the contractor is required to complete. It includes the tasks to be undertaken, the reporting requirements and the requirement for and timing of reviews. The SOW is supplemented by the Document Requirements List (DRL) which details appropriate Product Descriptions (PD) within the ILS section.

2.13.2 Document Requirements List (DRL)

The Document Requirements List (DRL) is a contractual document. The DRL specifies the information to be delivered under the terms of the contract. It defines the delivery requirements (including timings) and configuration control for each deliverable. Where the amount of detail requires it, a specific ILS Product Description (PD) has been used to provide further details of the requirement.

2.13.3 Integrated Support Plan

The Integrated Support Plan (ISP) is a contractual document. It shall be prepared by the contractor and describe in detail the contractor's ILS organisation and the activities planned to provide the contractual deliverables. The ISP is the principal document by which the ILS content of a tender bid will be assessed; as such the inclusion of a comprehensive draft with the tender response is mandatory.

2.13.4 SA Plan

The Supportability Analysis Plan (SAP) will, upon contract award, become contractual. It is to

be prepared by the contractor and shall describe in detail the contractor's SA organisation and the activities planned to fulfil the SA contractual requirements detailed in the SOW.

2.13.5 Monitor and Review Progress

The Authority will conduct reviews, as part of the Logistic Support or Configuration Change Management Committees, alternately at the Contractor premises and Authority premises, as described in the SOW. The initial review will be held within 30 days of contract award to confirm Authority/Contractor interfaces to agree the Contractor defined SA activities and to finalise SA data requirements. Any agreed changes of the SA activities will be incorporated into the SA plan. The Contractor will support the SA review team by providing administrative services such as preparing agendas, recording and publishing minutes, and providing technical reference data. The Contractor ILS Manager (or authorised representative) will attend, with authority to speak for and commit the Contractor during the SA reviews. At the beginning of each SA review the Contractor will make a presentation which describes the function of each product, system and sub-system to be reviewed, and the maintenance plan developed to date. The Contractor will also present the overall SA status, and identify any prospective problem areas. Notification of any problem areas or delays and proposed courses of remedial action will be submitted to the Authority prior to the review as proposed agenda items. The Contractor will subsequently monitor the accomplishment of outstanding items.

2.14 SA STRATEGY

SA shall be applied to PGMU in accordance with DEF STAN 00-600. However, the degree of implementation is dependent on the project phase, the level of design freedom and technical complexity of equipment. Tailoring of the SA tasks and the Logistic Information Repository (LIR) requirements are mandatory. The LIR shall be tailored to the level and depth consistent with the SA requirements and also the in-Service support management information system requirements.

SA is the principal tool of ILS and is the primary means by which the objectives of ILS are achieved. Its activities consist of a series of analytical tasks which:

a. Cause logistic support considerations to influence the design of the equipment (or in the case of PGMU, the selection of equipment already designed as COTS or other Non-Development items);

b. Identify support issues, readiness requirements and cost drivers as early as possible;

c. Define logistic support resource requirements for the life of the equipment;

d. Develop a common logistic support database called the LIR for use in the through life equipment support management.

It is recognised that the system will wholly or predominantly consist of COTS/MOTS equipment and the SA programme is to be tailored accordingly.

Support for PGMU is to be in place by the LSD which will precede SAT(ME) for the FOC vessel by 3 months.

2.14.1 SA Tailoring

Only those SA Tasks deemed worthwhile and cost effective in optimising the support solution for PGMU will be undertaken. Those SA Tasks which are considered nugatory will not be addressed.

The SA programme addresses the following areas:

JSP886 Equivalent Task No	Task Title	Topics	PGMU Issues
D&M PHASE TASKS			
102	SA Plan	How does the contractor propose to carry out the SA requirements?	The contractor will commence the ILS programme after MG.
103	SA Reviews	What is the status of the contractor's SA progress?	SA reviews will be held with the contractor after MG, once the contractor's ILS programme has begun.
202	Standardisation	How can standardisation benefit the project? The purpose of Task 202 is to develop criteria for the new equipment that will maximise use of the existing or planned resources.	Identify existing and planned logistic support resources, which have potential benefits for use. Investigate current support arrangements and identify pros and cons to be retained as 'best practice' or rejected accordingly. Dovetail into support systems of legacy systems where it is beneficial to do so. Improve where possible.
205	Design Factors	What is reasonable support and support related design goals for the programme?	Supportability considerations should influence choice of COTS/MOTS components.
301	Functional Requirements	What functions must be performed by the support system of the new programme? Identify operator and maintainer tasks.	Contractor to carry out this SA task.
302	Support System Alternatives	What are the alternatives available to the support system? (lines and levels of repair, CLS, MOD, sparing techniques, testing, different STE etc)	Support Options Matrix (SOM) has been used by the MILSM to identify the split of CLS and In-House support tasks.

JSP886 Equivalent Task No	Task Title	Topics	PGMU Issues
303	Evaluation of Alternatives and Trade-Off Analysis	What is the best (optimum) support solution based on analysis of the options. Level of Repair Analysis (LORA) will influence options. Recommend preferred training method, numbers and skill of personnel, changes to support parameters which would result in a decrease in MTTR (Maintainability) or increase in MTBF (Reliability - RCM), testing concept, energy requirements and support facilities. All ILS elements to be considered and analysed.	The Restricted procurement strategy limits the contractor's ability to perform trade-offs. The Authority's requirements as specified in the SOW must be complied with.
401	Maintenance Task Analysis	What support resources (across all ILS elements) are required to support the new system? Record results in the LIR.	No increase to maintainer staffing; maximum use to be made of ship's engineering staff.
402	Early Fielding Analysis	What is the impact of this programme on the existing support infrastructure?	Consider potential increase of maintenance activities and logistic footprint whilst legacy systems are still being used and supported.
403	Post Production	The analysis of likely or potential post deployment problems in assuring an adequate supply of spare and repair parts This task is intended to ensure potential post production support problems such as the closure of production lines, obsolescence of design, expected discontinuances of business by manufacturers, etc identified and addressed.	Obsolescence will be an issue and needs to be addressed during the PGMU D&M phase. Exit strategy (to enable support continuity) will need to be defined.

JSP886 Equivalent Task No	Task Title	Topics	PGMU Issues
501	Assessment & Test	What support problems are raised by test and evaluation and other assessments?	Logistics Demonstration will be required. In-Service Reliability Demonstration (ISRD) may be required if there are R&M issues (e.g. lack of confidence in R&M Case Report) – this requirement will be addressed during the D&M phase.

Table 1 – PGMU SA Tasks

2.14.2 Logistic Information Record (LIR)

1. The aim of the LIR is to capture the results of SA and the resources required to support the system. The contractor will be tasked with proposing the most cost effective way of recording the results of SA.

2. Collecting and storing SA Data in a Database can be expensive and time consuming. As PGMU contains mainly/wholly COTS or Non-Development equipment a full SA is not cost-effective or necessary. It has been assessed that the SA data can be held in a simple database or spreadsheet which must be MS Office 2003 compatible. The data must be entered in order to assess the supportability of the equipment being analysed and to capture the decisions made on the various ILS elements. The LIR will provide much of the input data to the eventual Support Policy Statement (SPS). There is no requirement for a full LIR – a spreadsheet which provides the results of SA Task 401 (Task Analysis) may well suffice and should include, as a minimum, worksheets as follows:

   a. Equipment Breakdown structure (EBS);

   b. Fault Analysis (may be linked to a Failure Modes Effects and Criticality Analysis (FMECA));

   c. Maintenance Tasks;

   d. Support resource requirements (Training & Training Equipment, Facilities, Technical Documents, STE, Spares and PHS&T.)

2.15 ILS ELEMENTS

The ILS Elements which are considered relevant to the PGMU are explained in more detail in the attached Annexes. The annexes give details of the planned effort of each ILS element and include the policy that affects that particular ILS element, a description of the outputs and deliverables of any contracted ILS Work Package, and a view as to how work within a contracted package will be conducted. Compliance of the support proposal against the Support Solutions Envelope is also addressed where applicable.

The ILS Elements (with their respective Annex letters) are as follows:

ILS Element Plan	Annex
Reliability & Maintainability (R&M) Management Plan	A
Maintenance Plan	B
Technical Documentation Plan	C

Human Factors Integration Plan	D
Training and Training Equipment Plan	E
Supportability Assessment Plan	F
Whole Life Cost (WLC) Plan	G
Obsolescence Management Plan	H
Supply Support Plan	I
Support & Test Equipment (STE)	J
Facilities Plan	K
Packaging, Handling, Storage & Transportation (PHS&T)	L
Software Support plan	M
Disposal Plan	N

Table 7 – ILS Element Plans

2.16 DESIGN INFLUENCE

In order to ensure that ILS issues are considered during the system design process, it is essential that the MOD ILSM and Logistic Support Committee (LSC) members (where appropriate) are involved and participate in all design reviews including the crucial Preliminary Design Review (PDR) and Critical Design Review (CDR). It is recognised that as the system solution is likely to comprise some COTS/MOTS items, the ability to influence design on these will be minimal although choice influence may be possible.

2.17 SUPPORT TRANSITION PLANNING

The SA Early Fielding Analysis task will be carried out to identify the impact of the introduction of the new equipment on legacy support systems and to identify sources of manpower and personnel to meet the requirements of the new equipment. Some factors for consideration will be:

- Repair facility workload and scheduling;
- Provisioning and inventory factors;
- Automatic test equipment availability and capability;
- Manpower and personnel factors;
- Training programmes and requirements;
- Software support requirements;
- Transportation systems.

2.18 Supportability Test, Evaluation, and Verification

A major element of the Demonstration phase is for the Contractor to demonstrate compliance with the SRD, accomplishment of the ILS SOW tasks, and show that a comprehensive support package has been identified. The Contractor must also develop an integrated acceptance approach and demonstrate that it is able to provide an effective support solution which conforms to the SRD. Demonstration of compliance will be by a mix of progressive assurance and verification activities leading to final acceptance.

The suggested evidence required by the Authority to satisfy the Test, Evaluation and Acceptance criteria for each requirement is identified within the SRD. As part of the Invitation To Tender (ITT) response, the tender is to provide an ITEAP which identifies the overall process and sets out the activities to be conducted in order to satisfy the requirement.

In addition to requirements for the mission system, the SRD also contains requirements relating to the support system and specific products needed within a Support Package e.g. Technical Publications and Spares. Therefore it is intended that Progressive Assurance and verification evidence for support system elements will be defined within the SRD & ITEAP.

2.19 LOGISTIC SUPPORT COMMITTEE (LSC)

Throughout the life of the equipments, the LSC will meet on a regular basis.

The aims of an LSC are:

- To monitor and manage the PGMU Logistic Defence Line of Development (DLoD);
- To establish endorsement of this PGMU ILSP through the engagement of the Supportability Community;
- To identify the overall logistic support implications of the introduction of equipment into service across all DLoD;
- To examine cost options and trade offs for the provision of Logistic Support and agree solutions;
- To agree the input to Invitations to Tender (ITT) and Review Milestones at each stage of the procurement strategy;
- To ensure coherence with the Capability Integration Plan (CIP) across all DLoD;
- To develop and maintain the PGMU Use Study;
- To assist with the Tender assessment of Contractors bids at each stage of procurement;
- To develop and refine criteria for the planning of Logistic Support Date readiness;
- To review PGMU Logistic Risks and Master Data Assumptions List (MDAL) Assumptions;
- To appoint sub-working groups as required.

The draft Terms of Reference for the LSC are at Annex P of this ILSP, these need to be reviewed and ratified at the commencement of contract phases with the Contractor.

The LSC will continue to meet throughout the life of PGMU up to and including the disposal of the end of life Platforms. Throughout this period, SMEs will provide specialist advice to the MILSM, particularly in the monitoring and assessment of Provider performance in their areas of expertise. These SMEs will also provide support in the form of defect investigation and the assessment of the suitability of proposed modifications, reporting to the LSC via the MILSM.

3 IN SERVICE PLANNING

3.1 IN SERVICE MONITORING OF LOGISTIC PERFORMANCE

The aim of the In-Service monitoring of logistics performance is to determine if logistics is providing the contribution required for Force Elements (FEs) to meet and maintain their readiness profiles (Force Elements at Readiness (FE@R)) as detailed in Defence Strategic Guidance (DSG).

Logistics Operational Assurance (LOA) teams are embedded in Fleet Headquarters with the aim of providing an environmental focus for the identification and monitoring of Logistics Risks and Issues. Each year, the initial action is to agree which FE will be covered and when, on a platform-by-platform basis. The reviews mainly concentrate on contingent operations, normally in the years 1- 4 timeframe. However the LOA teams also review current and programmed operations where appropriate.

T23 PT primarily uses the DE&S Ships Dashboard to enable data on equipment available days, downtime (Operational Defect (OPDEF) days), work packages, planned inventory spend and budgets to be brought together.

This section will be updated as the PGMU programme progresses to include the development of the process by which the in-service monitoring will be accomplished. In-service monitoring will be of paramount importance as the support solution includes CLS as the outcome of the monitoring will be the assurance part of the commercial and payment process.

4 RELATED DOCUMENTATION

The following paragraphs provide input into the ILS process but are outside the scope of the Authority ILS activities.

4.1 FIELDING PLAN

The Fielding Plan provides information on the fleet fitting plan for PGMU and the planned installation schedule.

4.2 RISK MANAGEMENT PLAN

Any ILS related risks which are identified during the PGMU programme will be managed within the overall PGMU Programme Joint Risk & Opportunity Management Plan (ROMP) process.

4.3 CONFIGURATION MANAGEMENT PLAN

All logistic activities (tasks, deliverables, hardware, software and data) are to be integrated with those of Configuration Management (CM) in accordance with the Contractor's CM Plan (CMP).

The specific objectives of CM for PGMU are to:

- Establish conventions for the unique identifications of configuration items and associate each with a unique configuration/baseline;
- Identify the issue status of all configuration items which make up a configuration/baseline;
- Identify the level to which configuration control is to be applied;
- Ensure that all changes to configuration items, and therefore configurations, are subject to formal change control;
- Ensure a particular configuration can be reliably and efficiently reconstructed;
- Ensure that the evolution of products and their components is controlled, and provides an auditable history;
- Formally record and maintain all deliverables;
- Enable the provision of validated identical copies of products;
- Ensure adherence to the Authority configuration management practices as detailed at Def Stan 05-57;
- Ensure adherence to the requirements for a Defect Reporting, Analysis and Corrective Action System (DRACAS) as detailed in Def Stan 00-40.

4.4 TECHNOLOGY REFRESH AND INSERTION

Evolving operational threats require the PGMU capability to be continually maintained and enhanced through life. Management of the equipment that underpins this capability therefore

requires review through a process of continuous improvement to meet the operational needs of rapid and global deployment. This operational driver must also be balanced against drivers of value for money and improved supportability.

The scope of technology management therefore relates to the activities of:

- Upkeep (maintenance, repair and overhaul);
- Update (reliability growth and obsolescence management);
- Upgrade (performance improvement and capability enhancement);
- Spares management;
- Reduction of WLC.

It should be noted however, that the current scope for PGMU is an 'Update' and any Upgrade to capability is currently beyond scope. The Authority will develop the Through Life Technology Management process such that technology refresh and insertion can be achieved and to develop a plan for its implementation.

4.5 STANDARDISATION

The NATO standardisation definition (approved by all NATO nations) is: "The development and implementation of concepts, doctrines, procedures, and designs in order to achieve and maintain the compatibility, interchangeability or commonality which are necessary to attain the required level of interoperability, or to optimise the use of resources, in the fields of operations, materiel and administration".

To facilitate NATO Force Interoperability, three levels of hierarchical standardisation have been defined:

- Commonality (highest level): "The state achieved when the same doctrine, procedures or equipment are used". (Units are identical within operational environment);
- Interchangeability (middle level): "The ability of one product, process or service to be used in place of another to fulfil the same requirements". (Units can be swapped within operational environment);
- Compatibility (lowest level): "The suitability of products, processes, or services for use together under specific conditions to fulfil relevant requirements without causing unacceptable interactions". (Units will function together within operational environment).

The application of the three levels of standardisation can assist in delivering a range of standardization benefits such as:

- Efficiency through variety control;
- Economy in manufacture and servicing;
- Avoidance of repetitive effort in producing new specifications, processes and products for each procurement.

These all support time, cost and performance benefits to the project.

The Authority will manage the standards applicable to PGMU. They will also detail the principles and process for co-ordinating PGMU standards, principles, guidelines, constraints and proposed application across the platform design and integration levels.

4.6 QUALITY ASSURANCE

All Authority activities conducted during the current and future stages of the PGMU life cycle

within this plan will be under the control of the PGMU System Quality Management System. This will ensure that all data, decisions and deliverables are approved, can be verified and are traceable to their source information.

During the Contract, the Provider will conduct their activities in accordance with the Quality Assurance requirements of the relevant contract(s).

Annexes:

A. R&M Management Plan
B. Maintenance Plan
C. Technical Documentation Plan
D. Human Factors Integration Plan
E. Training & Training Equipment Plan
F. Logistics Demonstration Plan
G. Whole Life Cost (WLC) Plan
H. Obsolescence Management Plan
I. Supply Support Plan
J. Support & Test Equipment Plan
K. Facilities Plan
L. Packaging, Handling, Storage & Transportation (PHS&T) Plan
M. Software Support Plan
N. Disposal Plan
O. Logistic Support Date (LSD) Criteria
P. Logistic Support Committee (LSC)Terms of Reference

ANNEX A TO
PGMU ILSP

5 RELIABILITY & MAINTAINABILITY (R&M) MANAGEMENT PLAN – ANNEX A

Introduction

1. The MOD attaches great importance to achieving a highly reliable and maintainable equipment both to ensure high operational readiness and availability, and to minimise Whole Life Costs (WLC). To this end, R&M shall be given equal priority with performance, whole life cost and timescale when allocating project resources. The aim is to minimise failures occurring and ensure that when they do occur that the system can be restored to a serviceable condition quickly and easily.

2. This Plan describes the approach to R&M, tailored in accordance with Defence Standard 00-40, to meet the needs of PGMU. The success of PGMU depends on providing a capability which is available as specified in the User Requirements Document (URD) and System Requirement Document (SRD). The design and/or selection of the system equipment must, therefore, consider not only performance aspects but supportability and support resource requirements.

Definitions

3. Def Stan 00-40 refers to the following definitions:

   a. Mission reliability [IEC 60050-191] is the probability that an item will perform its required functions for the duration of a specified mission profile.

   b. Basic reliability is the ability of an item to perform its required functions without failure or defect for the duration of its life profile [ARMP-7].

   c. Peacetime reliability can be defined in similar terms to mission reliability however; the 'mission' could be any task that the User undertakes outside a theatre of war or operation other than war (such as training).

   d. Maintainability is defined as the ‘probability that a given maintenance action performed under stated conditions and using stated procedures and resources can be carried out within a stated time interval’

Aim

4. The aim of the R&M Plan for PGMU is to ensure that trade-off studies between R&M, availability and WLC are undertaken, in order to achieve the optimum balance. R&M activities will need to be project specific but will need take heed of early project’s R&M activities and issues. The most likely PGMU issue is that if the system components are COTS (or NDI items), the reliability figures cannot be influenced and therefore the reliability programme will be confined to providing the MOD with the confidence that the R&M requirements will be met (through an R&M Case Report) using existing R&M data.

5. Software reliability (particularly where the applications may be bespoke) is considered to be the major reliability risk and should be adequately addressed by the contractor in his R&M Plan.

MOD ILS Manager

6. The MOD ILSM is the appointed R&M focus for the PGMU PT and is responsible to the PGMU PM for the execution of all PGMU R&M activities.

R&M Stakeholder Groups

7. **Project R&M Stakeholder Group** - A Project R&M Stakeholder Group will be chaired by the PGMU PM and supported by the PGMU MILSM. The group will monitor the contractor's R&M progress and ensure that the R&M requirements have been or will be met. The contracted deliverables for assessment will be an R&M Plan (at the beginning) and progressive assurance will be in the monitored through use of periodic R&M Case Reports.

8. **R&M In-Service Stakeholder Group** -The In-Service Stakeholder Group will be chaired by the In-Service Support Manager and will monitor and advise on in-service R&M. This group will analyse defect and failure reports and in conjunction with the contractor will identify modifications to the system which will raise the reliability or availability of the system to that required.

In-Service R&M Data

9. It is impossible to demonstrate the R&M of an equipment until representative versions of it have been built; even then, demonstrating very high reliability through testing may be impractical. This means that R&M modelling, (based on historical or manufacturer's data in the case of COTS or MOTS items) will play an important role in all phases of a project's R&M Programme. The validity of such modelling can only be established through comparison of modelling results with existing comparable equipment, or with the new equipment when it enters service. The collection of in-service data will allow validation/improvement of the R&M models of the equipment, which will assist when R&M improvements and other in-service upgrades are being planned.

Contractor's R&M Programme Plan and R&M Case

10. **R&M Programme Plan** - The R&M Plan will be agreed before contract signature and shall be called up as a separately identifiable part of the contract (guidance will be taken from the R&M 'Blue Book' available on the Defence Intranet).

11. The contractor will be required to produce a draft PGMU R&M Programme Plan with their tender response, to be updated after Contract Award in accordance with the DRL. The plan shall:

    a. Make it clear that the contractor understands the PGMU R&M requirements.

    b. Explain the contractor's activities to meet the MOD's R&M requirements with a schedule of events.

12. **R&M Case Report -** The contractor shall be required to submit R&M Case Reports throughout the Demonstration & Manufacture, In-Service and Disposal acquisition cycle phases, which will provide the authority with progressive assurance that the R&M requirements have or will be met by the time the PGMU system enters service.

Meetings and Reviews

15. The LSC will review the outputs of the R&M programme (including FMECA, LORA

and RCM reports) if deemed appropriate and of value, to determine the impact on other ILS elements such as Supply Support (spares holdings).

Programme Objectives

16. Demonstration of R&M characteristics will be required at appropriate stages of the programme. This includes the initial in-service phase during which an In-Service Reliability Demonstration may be required. The contractor will be invited to submit costed proposals for an ISRD although the decision whether to complete an ISRD will be dependent on the level of progressive assurance provided through the D&M phases. If the PGMU project is satisfied that the R&M Case provides sufficient evidence that the system will meet the R&M targets (bearing in mind that many of the system elements might be COTS and/or MOTS with potentially a great deal of usage data) then it may be decided that an ISRD (which could prove expensive) is not necessary. It may be that a partial ISRD will be completed which focuses on specific system elements.

R&M Product Plan

17. The planned deliverables for the R&M programme are as follows:

    a. R&M Plan – to be delivered by the contractor in accordance with the SOW.

    b. R&M Case Report – to be delivered by the progressively throughout the life of the programme.

R&M Risks

18. This section will be completed once the R&M risks have been identified. Risks will fall into the following categories:

    a. Performance (are the R&M requirements understood by the contractor, can they meet the requirements, are the sufficiently resourced with the correct experience etc).

    b. Time – is there sufficient time to plan for and implement an effective R&M programme?

    c. Cost – is there an associated high cost with meeting the MOD's R&M requirements?

Definitions

19. The R&M definitions for the R&M aspects of the SOW are as follows:

    a. Incident **-** Any event indicating a possible non-compliance with the specification and which is reported on the R&M reporting system.

    b. A Failure - the inability of an item to perform within previously specified limits;

    c. System Failure - any hardware, software (which is not recoverable to a fully operational state within ten minutes) or firmware fault, or combination thereof, which causes the PGMU system to be completely unable to perform one or more of the KURs in the URD (Ref A);

    d. Mission Failure - any system failure which causes the PGMU system to be unable to perform its mission essential capability;

    e. Major Failure - any system failure which causes the PGMU system to be operating at degraded mission essential capability, and for which there is no alternative workaround;

f. Minor Failure - any system fault which causes the PGMU system to be operating at degraded mission capability and gives rise to an unscheduled maintenance action, but for which there is an alternative workaround;

g. Software Failure - a Software Failure is any degradation of the system due to software that is recoverable to a fully operational state within ten minutes. If such a software failure takes longer than ten minutes to recover to a fully operational state, then it will be counted as a PGMU system failure under the overall definitions;

h. Logistic Failure - any failure which results in an unscheduled maintenance action. Note that system failures, major failures and minor failures can also be logistic failures;

i. System Fault - any single hardware, software or firmware fault which does not require immediate corrective action and does not prohibit the PGMU system from performing its Operational Requirement;

j. Hardware Fault - the state of an item characterised by the inability to perform a required function;

k. Software Fault - an imperfection or deficiency in the software that may, in some operation conditions, contribute to a failure;

l. Degradation - a software failure that prevents the accomplishment of a KUR for which there is no reasonable workaround;

m. **Operational Availability.**

$$\text{Operational Availability} = \frac{\text{MTBF}}{\text{MTBF + MTTR}} \text{ (expressed as a percentage).}$$

where:

(1) MTBF is the Mean Time Between Failures (Reliability).

(2) MTTR is the Mean Time To Repair (Maintainability) which takes into account logistic delay.

n. **Inherent Availability.**

$$\text{Inherent (intrinsic) Availability} = \frac{\text{MTBF}}{\text{MTBF + (MTTR-LD)}} \text{ (expressed as a percentage).}$$

where:

(1) LD is the Logistic Delay.

o. **Testability.** This is the degree to which an item facilitates the establishment of test criteria and the performance of tests.

The Contractor must clearly identify any alternative or additional wording of the above definitions that are used in their proposal.

Reliability and Maintainability Standards

20. The latest issues of the following standards shall be applied to meet the system's reliability and maintainability requirements:

Def Stan 00- 40 Issue 6 dated 13 Jun 2008:

Reliability and Maintainability Part 1 - Management Responsibilities and Requirements for Programmes and Plans

Def Stan 00- 42 Part 1 Issue 2 Publication Date 15 February 2008:
Reliability and Maintainability (R&M) Assurance Activity
Part 1 One-Shot Devices/Systems

Def Stan 00- 42 Part 2 (NB that Part 2 no longer exists)

Defence Standard 00- 42 Part 3
Issue 3 Publication Date 14 March 2008:
Reliability and Maintainability (R&M) Assurance Guide
Part 3 - R&M Case

Defence Standard 00- 42 Part 4
Issue 2 Publication Date 15 February 2008:
Reliability and Maintainability (R&M) Assurance Activity
Part 4 - Testability

Defence Standard 00- 42 Part 5
Issue 1 Publication Date 9 December 2005:
Reliability and Maintainability Assurance Activity
Part 5 - In-Service Reliability Demonstrations

Defence Standard 00- 42 Part 6
Issue 1 Publication Date 31 January 2007:
Reliability and Maintainability Assurance Activity
Part 6 - Maintainability Demonstrations

GR-77 Applied R&M Manual for Defence Systems

Contractor's Involvement with R&M

21. The SOW requires the contractor to undertake an R&M programme of work including the delivery of an R&M Plan and R&M Case Reports.

22. The contractor will be required to plan for and implement an R&M programme and to provide progressive assurance to the MOD (through an evolving R&M Case) that the PGMU R&M requirements will be met.

Failure Modes Effects and Criticality Analysis (FMECA)

23. One of the key activities in the reliability programme that feeds the ILS process is the FMECA. The contractor will be required to carry out a FMECA to identify the failure modes and provide mitigating action to ensure those modes do not affect the reliability of the system to such an extent that the availability requirements cannot be met.

RCM and LORA

24. The main activities in the maintainability programme that feeds the ILS process are RCM, which will identify the preventative maintenance activities, and LORA which will identify the level of complexity of the required maintenance tasks and any specific tooling or test rigs.

25. The contractor will be required to include these activities (FMECA, RCM and LORA) in their R&M Programme Plan and to describe how the outputs feed into the ILS process.

26. The associated reports will be deliverables, specified in the ILS SOW, which will be assessed by the MOD ILSM and LSC members. .

Operational Usage

27. One of the first activities in the R&M programme is for the user to define how the system is to be used (in terms of a usage profile) on operations, for training (individual and collective training) and peacetime tasks.

R&M Activities

28. The following are key R&M tasks which will be carried out in the D&M Phases:

a. PGMU PM assumes chair of R&M Stakeholders Group.

b. Produce a detailed R&M Programme Plan (to be produced by the contractor)

c. Develop the availability model (to be completed by the contractor)

d. Carry out R&M risk assessments.

29. The table below shows the expected progress of the R&M programme at the various acquisition stages.

30. The work strands in the Main Gate column needs to have been completed prior to the PGMU Main Gate submission.

	Compliance Test	Main Gate	Prior to ISD	In-Service
1	Establish and Maintain R&M Programme	R&M Plan defined R&M Case developed R&M Risks managed R&M addressed in TLMP	Plan implemented R&M Case matured R&M Risks mitigated	Plan implemented R&M Case maintained R&M Risks mitigated
2	User Requirements	R&M requirements refined R&M addressed in MGBC R&M Reqts in SRD	Due weight given to R&M requirements	Feedback experience
3	System / Support Requirements	System &/or Support - Requirements derived	R&M requirements – ITT Reqts realised	Monitor solution
4	Procure System Solution	R&M clauses in Contract Project Panel meets Requirements developed		In-Service Panel meets

	Compliance Test	Main Gate	Prior to ISD	In-Service
5	Test, Evaluate & Accept System	R&M addressed in ITEAP	R&M tests conducted	R&M validated
6	Gather In-Service Data	Measurement plan defined resources & funded	Plan implemented	R&M data gathered & analysed DRACAS operated

Table A1 – R&M Programme Activities

31. The Contractor shall supply evidence and analysis throughout the contract to build confidence that the R&M requirements have been/will be achieved in the final level of R&M. This collection of evidence, analysis and arguments will be included in an R&M Case Report. The process will start with a detailed analysis of the requirements, followed by the development of a strategy to achieve the requirements. A direct output of the strategy is the contractor's R&M Plan of activities and a schedule for achievement.

32. Data resulting from the R&M activities will be processed to produce evidence to support claims that the R&M requirements have been achieved. The relevance of all evidence must be argued. The evidence shall be plotted against the schedule to indicate the extent to which the strategy is producing sufficient evidence to confirm the achievement of R&M requirements. In the event that this process indicates that there is likely to be insufficient evidence, the strategy and R&M activities must be amended appropriately.

33. The body of evidence supporting the claim of R&M requirements achievement shall form the R&M Case, which is defined as a reasoned, auditable argument created to support the contention that a defined system satisfies the R&M requirements. The R&M Case Report is defined as a summary or abstract of the R&M evidence and arguments from the R&M Case to support programme milestones.

34. The R&M Case Report and R&M Programme Plan shall be issued formally after contract let as detailed in the Contract DRL. The latest version of the R&M Programme Plan and R&M Case Report shall be reviewed and discussed at each project review meeting.

Logistic Demonstration/Ease of Maintenance Assessments and Integrated Test and Evaluation.

35. SMEs (classified as Government Furnished Assets (GFA)) will be made available for participation in supportability assessments. Manpower requirements are to be identified at the earliest opportunity by the contractor and submitted to the PGMU MILSM for staffing. Trials team members are to be trained to an appropriate level so that they can be effective during the trials.

In Service Reliability Demonstration (ISRD)

36. The decision to complete an ISRD will be dependent on the level of progressive assurance provided through the D&M phases. If the PGMU PT is satisfied that the R&M Case provides sufficient evidence that the system will meet the R&M targets

(bearing in mind that many of the system elements are COTS with potentially a great deal of usage data) then it may be decided that an ISRD (which can prove expensive) is not necessary. It may be that a partial ISRD will be completed which focuses on specific system elements.

R&M Assurance

37. As part of the Support Assurance activities with the JSC prior to MG, the PGMU MILSM response to the R&M Governing Policy will be assessed by the JSC-TLS R&M SME, who will advise the SSO on the status of the PGMU R&M programme.

ANNEX B TO
PGMU ILSP

6 MAINTENANCE PLAN – ANNEX B

Introduction

1. The approach to identify the optimum maintenance plan to support PGMU is detailed in this section. Included is the overall equipment maintenance concept (based on the support system for the legacy PGMU systems), lines and levels of repair (including the use of LORA) and relevant maintenance factors which will need to be addressed. This plan will develop as the PGMU ILS programme progresses and the results of the associated SA are known.

2. The eventual Maintenance Policy will cover in detail the following areas:

    a. Overall Maintenance Policy for PGMU

    b. Lines and Levels of Maintenance

    c. Maintenance Policies covering the following types of activities:

        (1) Principles of Fault Diagnosis
        (2) Repair Policy
        (3) Maintenance by Exchange
        (4) Maintenance by Repair
        (5) Use of AR&M Data
        (6) Onboard Repair Policy
        (7) Mission Time
        (8) Panel Electronic Circuit (PEC) Repair
        (9) Electrostatic Sensitive Devices
        (10) Items not Repaired or Replaced in situ/Onboard
        (11) in situ /Onboard Maintenance Policy
        (12) Design Authority Maintenance Schedule (DAMS)
        (13) Reduction of Maintenance Policy
        (14) Preventive Maintenance Downtime
        (15) Refitting Dockyard Support
        (16) Dockyard Repair
        (17) Allowable maintenance periods

    d. Maintenance Schedules for Planned (Preventative) and Corrective Maintenance

    e. Use of Built in Test (BIT) – ideally BIT should diagnose down to a single LRU.

3. Maintenance Planning is a principal element of ILS concerned with ensuring the provision of relevant information in the development of maintenance policy prior to the LSD. The principal tool for maintenance planning is SA. The process includes the analysis of failure modes (using FMECA), the identification of preventive and corrective maintenance tasks (using RCM), the required resources and the development of a coherent maintenance policy.

4. The PGMU maintenance solution must achieve and sustain the optimum level of availability of equipment during peacetime exercises and operations. Full use will be

made of the existing support infrastructure used to support the legacy system, suitably tailored to meet the specific requirements of availability, manpower and WLC.

5. The Maintenance Plan for PGMU shall follow the maintainability guidelines of DEF STAN 00-40, Reliability and Maintainability. As such, it complements the R&M Programme Plan with an emphasis on maintainability activities to be undertaken during the D&M phases.

6. In addition, the series of Def Stan 00-45 (Reliability Centred Maintenance) will be used to plan the RCM activities which will identify the required preventative maintenance tasks. Analysis of RCM data from the contractor (including FMECA results) will be analysed by the RCM team in the Ships Enabling Business Group.

7. The proposed maintenance concept shall reflect availability and supportability requirements for the PGMU System (as defined in the URD and SRD) and the need to minimise through life cost of ownership. The maintenance concept shall be further refined during the D&M phases and include a FMECA, RCM and LORA.

Programme Management

8. The PGMU ILSM will act as the focal point for all Maintenance matters with assistance from the LSC.

Meetings and Reviews

9. Maintenance planning will be an agenda item for the LSC. Maintenance planning implications shall also be discussed at all Programme and SA Reviews.

Programme Objectives

10. The principal tool used to develop the maintenance system for PGMU will be SA. As the maintenance programme develops, the data generated by SA Task Analysis will be reviewed by the Contractor, the MILSM and members of the LSC. As a result of these reviews, changes may be recommended to the maintenance concept proposed for individual Candidate Items or indeed the overall PGMU system. These changes may include:

    a. New maintenance concepts to be considered;

    b. Existing maintenance concepts to be modified;

    c. Non cost-effective maintenance concepts to be deleted.

11. Any such changes will be considered at the appropriate ILS/SA Review which should consider the impact of the change on the overall programme time-scale and budget. Additionally, changes to the overall system maintenance concept may result in revisions and refinements being made to key ILS documentation supporting the ILS/SA programme.

CLS Assumption

12. It is assumed that some level of Contractor Logistic Support will be required throughout the in-service life of PGMU. The Contractor is required to provide proposals for a number of support options as detailed in the SOW.

13. CLS has been included in the support strategy and it is also assumed that support will be delivered by a Class Output Management (COM) arrangement as part of the Surface Ships Support (Alliance) (SSS(A)).

14. Contractors on Deployed Operations (CONDO). It is expected that contractors will be required to deploy on operations to support PGMU assets. This will be analysed as part of the Supportability Analysis and in particular the Maintenance Plan which will determine the optimum Lines and Levels of Repair. As CONDO is an essential element of the PGMU support solution, the relevant policies in JSP 567 (Contractor Support to Operations) shall be followed and DEFCON 697 (Terms and Conditions) will be incorporated within the contract without amendment or caveats.

Current/Legacy Equipment Maintenance Policy

The maintenance policy will be defined through SA but as a baseline assumption, it is assumed that the Maintenance Plan will conform to the framework outlined in BR 1313 Series (Maintenance Management in Surface Ships) combined with the current Maintenance Policy for the Type 23.

15. Reference Document - BR 1313 Series (Maintenance Management in Surface Ships) acts as a 'one-stop shop' for all personnel (afloat or ashore) and is a reference to the maintenance roles and responsibilities and how ship maintenance and defect repairs are managed. It includes the over-arching maritime policy, concise guidance on Corrective Maintenance (Defect Repairs), detailed guidance on maintenance management systems and broad guidance on other areas that impact on maintenance (e.g. Rationalised Tool System (RATS), Alas, Configuration Management etc). As a result, BR 1313 will be used as a framework by both MOD and the eventual contractor for identifying the optimum maintenance plan.

16. To enable ships' staff to control and administer the maintenance activities carried out on board (either at sea or in harbour), the Unit Maintenance Management System (UMMS) will be used.

Reliability Centred Maintenance (RCM) - Equipment Procurement

17. Safe, defensible maintenance for HM Ships shall be derived via a functional approach using the Reliability Centred Maintenance (RCM) process as described in Defence Standard 00-45 and Maritime Technical Instructions (available on the RCM webpage) which will be available as BR1313A from Jan 2013. RCM aims to maximise system availability using optimum resources and is the endorsed maintenance policy for future warship platforms (and sub systems). It will be applied to PGMU in order to identify the required preventative maintenance tasks to maintain equipment availability at the required level.

18. RCM studies are to be submitted to the MOD DE&S Maritime Maintenance Support Group (MMSG) for independent RCM methodology audit and approval before maintenance can be hosted in UMMS.

[redacted]The maintenance solution shall be produced using the MOD's WinUMMS software application; available at nil cost provided a Non Disclosure Agreement (NDA) is agreed with the holder of the IPR for UMMS (IFS Defence). Maintenance Tasks shall be written in accordance with BRd 1313 Maintenance Management In Surface Ships and supplied with the maintenance solution in MS Word format using the template supplied by the MOD Advice and guidance can be obtained from the [redacted]

20. The WinUMMS delivery will be audited, validated and approved by the Design Authority/Equipment Project Manager, Platform Authority and MMSG before being set live in the UMMS Shore database then replicated to the Ship database for use by Ship's Staff maintainers.

21. The eventual derived RCM preventative maintenance activities will be entered into UMMS and covered in the Equipment BRs.

Maintenance Responsibilities

22. The following appointments and organisations will play a key role in the maintenance of PGMU assets:

    a. Platform Team (PT) Support Manager (SM), based at DES SHIPS – SS(A), Abbey Wood - responsible for overseeing the maintenance state of the platform.

    b. Equipment Teams - responsible for the support of equipments which are included on the various platforms.

    c. Superintendent Fleet Maintenance (SFM) - responsible for the management of all engineering support, upgrade, update and maintenance to ships and submarines based at, visiting, being refitted or undertaking Operational Sea Training (OST) at Portsmouth, Devonport or Clyde, during both Upkeep and Fleet time. Naval bases have partnering arrangements with contractors (BSML, DNL and FSL) who operate the Naval bases on a commercial basis. They are supported by SFM highly trained service staff that also operate worldwide and maintain electronics and weapon equipments as well as platforms. Within the SFM teams, the Platform Group Officer (PGO) is responsible for Cat B (and CAT A2 maintenance tasks, approving OPDEFs and high priority WRFs) items through Fleet time.

Categories of Maintenance

23. Categories of maintenance are shown in the following table (not all of which are applicable to PGMU, but included for completeness):

CATEGORY	SUMMARY	RESPONSIBILITY
A	Task within ship's capabilities and resources either at sea or alongside. No external resources required.	Marine Engineering Officers (MEO)
A1 Checklist	Task within ship's capabilities and resources either at sea or alongside. Short interval but do not fall into CAT 3 (Rounds) definition.	EO
A2 (Low Level Maintenance)	Semi-skilled tasks, can be carried out by ship's staff but normally completed by external resources.	EO
A3 (Routines)	Available for ship's staff to view and amend Standing Orders accordingly	EO
A4 (Activity Driven)	Triggered by a gun firing or receipt of replacement equipment (Do not occur at regular or specified intervals (not preventative maintenance)	EO
B	Base Support tasks that require external assistance (including personnel) Generally, ship will need to be alongside	PT SM
B1 (Underwater Engineering)	SSP and SSP(D) work packages	PT SM

B2 (Extended Readiness)	Will be defined in a RCM TM	PT SM
C	Tasks requiring a dry dock or ship lift (Where a Underwater Engineering (UWE) task is impractical or not cost effective).	PT SM

Table 2**- Categories of Maintenance**

24. Maintenance Concept – the current assumed maintenance concept is based on:

a. **Preventative Maintenance**. CAT A preventative maintenance tasks are identified through the Reliability Centred Maintenance (RCM) process with those tasks being captured on UMMS and being carried out by ship's staff.

b. **Corrective Maintenance**.

(1) Category A corrective maintenance tasks are carried out by ship's staff.

(2) Category B corrective maintenance tasks will be carried out by the contractor/OEM or a Forward Support Unit either alongside in the Base P or at a HNS port on deployed operations.

c. **Levels of Maintenance**. The four levels of maintenance are:

(1) Level 1. Level 1 maintenance is servicing and day to day preparation. It may include such operations as functional testing, replenishment, servicing, re-arming, role changing, minor modification, fault diagnosis and corrective maintenance by replacement, adjustment or minor repair.

(2) Level 2. Level 2 maintenance is maintenance by replacement, adjustment or minor repair including fault diagnosis and minor authorised modifications, within specified times, using generally provisioned resources.

(3) Level 3. Level 3 maintenance is maintenance in greater depth than level 2. It includes such operations as repair, partial reconditioning and modification requiring special skills or special equipment; but which is short of complete strip, reconditioning and re-assembly.

(4) Level 4. Level 4 maintenance is that maintenance which is full reconditioning, major conversions, or major repairs.

25. Lines of Equipment Support. The lines of equipment support within the Royal Navy are:

a. **First Line – Ship's Staff On Board Ships** - The organisation immediately responsible for the maintenance and preparation for use of complete systems or equipment. Ship's staff schedule and carry out Level 1 and 2 (Cat A) maintenance (see table below for details of maintenance categories).

b. **Second Line** - The organisation immediately responsible for providing maintenance support to ships:

(1) Superintendent Fleet Maintenance (SFM) located at the 3 HMNBs (Portsmouth, Devonport and Clyde).

(2) Surface Ships Support Alliance (SSSA) - Ship Alongside (Port or Naval Base). Level 2/3 repairs are carried out by contractors (BAE Systems or BABCOCK Marine etc) when the ship is alongside in HMNBs or other UK or Foreign ports. In the case of T23, maintenance is managed by BAE System's T23 Class Output Management (COM) under the SSSA, but noting that the COM is a joint MOD/BAES/Babcock team.

(3) Forward Support Unit (FSU) – provides forward support to deployed T23s. Designed to be sited at a suitable host nation port, it can also deploy in part, onboard a craft of opportunity, usually an RFA vessel to create a Forward Repair Ship (FRS)..

c. **Third Line**. Industrial Support at HMNBs through the dockyard companies using their in-house resources supplemented by appropriate sub-contractors. For example, BAE Systems Surface Ships at Portsmouth and Babcock Marine at Devonport. The services available include comprehensive manufacturing and refurbishment workshops, dry docks to suit all classes of Royal Navy (RN) ship and all specialisations to survey, plan, investigate, supervise, test and deliver the project. Whilst the home Naval Bases are the normal venue for such activity, especially as part of planned Upkeep Periods, the capability exists to contract for and manage large repairs including dry dockings abroad should the situation demand it.

d. **Fourth Line**. Industry, including Original Equipment Manufacturers (OEMs), provides maintenance support to the RN and support prime contractors such as BAE Systems.

26. RN Maintenance Categories. The following table describes the various RN maintenance categories (Reference: BR 1313 – Maintenance Management in Surface Ships).

CATEGORY	LEVEL	SUMMARY	RESPONSIBILITY
A	1	Task within ship's capabilities and resources either at sea or alongside. No external resources required.	Engineering Officers (EO)
A1 Checklist	1	Task within ship's capabilities and resources either at sea or alongside. Short interval but do not fall into CAT 3 (Rounds) definition.	EO
A2 (Low Level Maintenance)	2	Semi-skilled tasks which can be carried out by ship's staff but normally completed by external resources.	EO
A3 (Routines)	1	Available for ship's staff to view and amend Standing Orders accordingly	EO
A4 (Activity Driven)	2	Triggered by a gun firing or receipt of replacement equipment (Do not occur at regular or specified intervals (not preventative maintenance)	EO
B	2/3/4	Base Support tasks that require external assistance (including	Project Team (PT) Support

		personnel) Generally, ship will need to be alongside	Manager (SM)
B1 (Underwater Engineering (UWE))	3	Ship Support Period (SSP) and SSP(Docking) work packages	PT SM
B2 (Extended Readiness)		Will be defined through Reliability Centred Maintenance (RCM)	PT SM
C	3 or 4	Tasks requiring a dry dock or ship lift (where a UWE task is impractical or not cost effective).	PT SM

Table 3**– RN Maintenance Categories**

27. The following table shows the lines and levels of repair that are applicable to PGMU.

Line	Location	Repair Organisation	Level (Depth of Maintenance Task)	Comment
1st line (Ship)	On Ship (either at sea or alongside)	Ship's Staff	Cat A	
2nd Line (Afloat)	Joint Operations Area (JOA) - at sea	Afloat Forward Support Base (AFSB) on RFA	Cat B	
2nd Line (Naval Base)	HMNB Portsmouth/ Devonport – alongside	T23 COM - Maintenance Management through the SSSA. Maintenance carried out by SFM team personnel.	Cat B	
3rd Line	OEM's premises	OEM	Cat C	

Table 4 - **PGMU Lines and Levels of Repair**

Operational Maintenance & Repair (OMAR) – Capability Description

28. The Royal Navy Operational Maintenance & Repair (OMAR) Capability Description can be found in Chap 11 of BR 2002 (Maritime Operational Logistics, The diagram below provides a summary view of the various repair organisations and Echelons (tiers or lines of support).

Figure 3 **– Description of OMAR**

29. Maintenance Planning – The level of repair of each Maintenance Significant Item (MSI) will be determined through the contractor carrying out a Level of Repair Analysis (LORA). The maintenance responsibilities of both the users and the agencies who are the next lines of support for the system will be captured in the PGMU Support Policy Statement which will be produced in the D&M phase (prior to ISD).

30. Inspections. The preferred maintenance policy for the new equipment, including user inspection and routine servicing, will be confirmed by RCM and Level of Repair Analysis (LORA) carried out by the contractor during the AP as part of the SA and maintainability programmes. Maintenance operations will be kept to a minimum over the operational life of the new system. Design consideration will be given for easier execution of technical inspections and repairs that will mean the system will have a higher overall availability.

Allowable Maintenance Periods

31. Allowable Maintenance Periods. The impact of routine maintenance must be minimised in order that it does not prejudice operational availability. Loss of some MP functions for planned maintenance should be kept to an absolute minimum and it is desirable that planned maintenance activities take place during pre-determined and agreed periods. Where loss of functionality results from planned maintenance, it is essential that this maintenance can be delayed for operational reasons without prejudicing the short or long term health of the system.

OPDEF and Defect Management

32. The management of Operational Defects (OPDEF) is performed using the OPDEF Data Management System (ODMS). It is planned to have UMMS and ODMS linked by 2018.

33. The majority of defects/faults which are not deemed OPDEFs are entered into and managed through UMMS.

34. Maritime Equipment Performance Reporting Dashboard (MEPRD) – the results are collated and summarised in the MEPRD.

Development of PGMU Maintenance Plan

35. The following areas of maintenance will be addressed and the decision populated as the project progresses. The finally approved maintenance policy will be captured in the PGMU BRs and assessed during the Logistic Demonstration.

    a. Levels and lines of maintenance (derived from LORA) – what levels of repair are applicable to the PGMU system and at which location (ship or shore) will those levels of repair be carried out?

b. Fault diagnosis – how will system faults be identified?

c. Maintenance by exchange – identify which items are best repaired by replacement.

d. Maintenance by repair – identify which items are best rectified by repair.

e. Printed Circuit Board (PCB) repair – is it feasible to repair PCBs and where will that task be completed?

f. Design Authority maintenance schedule – will any scheduled maintenance be required?

g. Preventative maintenance downtime – identify the preventative maintenance activities that are required and when and where they will be carried out.

36. The legacy platform maintenance policy can be used as a basis for the formulation of the optimum maintenance policy for PGMU.

37. The aim is to recommend the preferred PGMU Maintenance policy by MG which can be refined during the D&M phases.

Maintenance Concept

38. The PGMU Concept is that ships' staff will carry out as great a depth of maintenance as possible (including acting as the contractor's 'trusted agent' to undertake preventative and corrective maintenance for warranty items) whilst afloat and ashore whilst deeper repairs will be carried out through the auspices of the T23 COM under SSSA) or the PGMU Contractor (OEM).

ANNEX C TO
PGMU ILSP

7 TECHNICAL DOCUMENTATION MANAGEMENT PLAN – ANNEX C

References:

A. JSP 886 Vol 7 (ILS) Part 8.05 (Technical Documentation).

B. Def Stan 02-40 - Requirements for the Preparation of Technical Publications - Part 1 - System & Equipment Publications.

C. JSP 543 - Defence Technical Documentation Guidance.

Introduction

1. Technical Documentation (TD) is the information necessary to operate, service, repair and support PGMU throughout its life. TD contains information covering the technical description, operating instructions, provisioning, maintenance, repair, support, and disposal of defence materiel.

2. PGMU TD includes:

   a. Technical Publications to be used by operator and maintainer staff including:

      (1) Support Policy Statement (produced by the MILSM)

      (2) Books of Reference (BRs) – produced by the nominated contractor

      (3) Marine Engineer Guides (MEG) - produced for the MEO on board (oil proof, tear proof for top pocket - quick aide-memoire).

      (4) Illustrated Parts Catalogue (IPC)

      (5) Technical Drawings

   b. Support Analysis (SA) data

   c. Data Modules (for use in the compilation of tech docs)

   d. Text or illustrations

   e. Reproducible Master Material

   The contractor will be responsible for the production of TD.

Purpose

3. The purpose of the TD Plan is to ensure that all documentation required for the support of PGMU is procured and maintained throughout the PGMU's life at an optimum cost.

Aim

4. The aim of this plan is to ensure all technical documentation options are considered in terms of providing value for money and cost effectiveness over the life cycle of PGMU in order to develop and implement a technical documentation strategy and delivery plan.

Planning

5. The MILSM will maintain this plan with assistance from the LSC and where necessary, MOD TLS - Technical Information section.

Contractor's Document Management Plan

6. The Contractor shall provide a Technical Documentation Management Plan (TDMP) as part of the Integrated Support Plan. The TDMP will detail how the Contractor will develop and deliver the technical documentation for PGMU during the subsequent procurement phases.

Meetings and Reviews

7. Technical Documentation will be an agenda item for the LSC. TD progress and issues will be addressed at all Programme Reviews and SA Reviews.

Quality Reviews

8. TD will be subject to quality reviews at stages throughout the procurement programme including:

    a. First Verification (by the Contractor).

    b. Second Verification (by the Authority).

    c. Validation of the final deliverable, including certification of technical accuracy and fitness for purpose (by the Contractor).

    d. Acceptance testing of the final deliverable (by the Authority).

TD Strategy

9. It is MOD policy and required by Director Joint Support Chain (D JSC) and the Logistics Policy Working Group (LPWG) that:

    a. Technical Documentation shall be;

        (1) Produced and delivered in electronic format as Electronic Technical Documentation (ETD).

        (2) Provided to every equipment to support, maintain, train and provide technical support from the first usage, allowing it to be operated, managed, maintained and disposed of effectively, efficiently and safely.

    b. The output shall be available as close to the point of use as is possible.

    c. TD is to be delivered in a structured coherent format whose configuration is controlled throughout its life.

    d. TD is to be delivered in an appropriate format accessible to all users, including:

        (1) Support contractors

        (2) MOD authorities

        (3) Establishments

        (4) Deployed units throughout the world.

10. The MOD Joint Service JSP 886 Vol 7 (ILS) part 8.05 (Technical Documentation) details the policies and requirements for the preparation, distribution and maintenance of Technical Documentation for the MOD and Armed Forces.

11. All TD activities undertaken as part of this procurement programme will comply with the requirements of the JSP. The final deliverable TD should be in ETD format. This shall include:

    a. Books of Reference (BR).

b. Marine Engineering Guides (MEG) for on board distribution by marine Engineer Officers (MEO). These guides are intended to be used in conjunction with the relevant BR and Operating Instructions.

12. PGMU documentation is to be produced as Electronic Technical Documentation (ETD).

13. Digital BRs are to be produced and delivered in pdf format and meet the following requirements:

a. The production version to be used is Adobe Acrobat 9 or later. Output files saved at version 7 (1.6)

b. Content to conform to DEF Stan 02-40 Parts1-4 & JSP 182

14. For the Production of Illustrated Parts Catalogues, the following requirements are to be met:

a. DEF Stan 02-48 & 02-54 & Cataloguing Specification 9

15. Consideration will also be given to the integration of TD, Computer Based Training (CBT) and Built In Test (BIT), where it can be shown to provide improvements in overall functionality or a reduction in whole life costs.

16. All TD for PGMU shall be produced in English using the Oxford English dictionary and ASD-STE 100 (Simplified Technical English and which is a standard set of Writing Rules and a Dictionary of controlled vocabulary used when producing documentation to ASD S1000D standards). If elements of the system are procured from overseas sub-contractors, the prime contractor shall ensure that documentation is translated. Terminology shall be in accordance with the agreed project glossary.

Data Exchange

17. Data exchange between the contractor and the customer will be by electronic means and will be specified in the contract.

Activities in the Demonstration Phase

18. Develop and document TD including arrangements for custody and maintenance of the Common Source Database for the life of the equipment.

19. The division and distribution of each deliverable type where the optimum solution comprises more than one type of deliverable.

20. Procure and maintain TD consistent with the attainment of the required Operational Availability and optimum WLC..

21. Document the results in the Support Policy Statement.

22. The aim of the TD element of ILS during the Demonstration is to create TD in Electronic format in conjunction with the equipment design. The principal output will be the Deliverable ETD.

Manufacture

23. The aim of the TD element of ILS during the Manufacture Phase will be to deliver the required Final ETD at the LSD.

(Note: Interim documentation will be required for Trials and Acceptance Testing (including Ease of Maintenance Assessments and should be in the format of the final deliverable so that users in the trials can see and use what will be delivered).

24. Production of New BR/MEG. The Sponsor will send the requirement to the BR Publication Authority (PA) using the application form for a new BR. The form (NTPA_1) will need to be completed and sent to the Publication Authority.

25. The completed BR will be held as a reference document on the BR1 - electronic website: 'The Online Reference of Publications of the Royal Navy'.

ANNEX D TO
PGMU ILSP

8 HUMAN FACTORS INTEGRATION (HFI) PLAN – ANNEX D

Introduction

1. Operational effectiveness is not entirely dependent on technical performance; it must also take into account the capabilities and limitations of the user. The Human Factors (HF) programme for PGMU will ensure that the system design considers all relevant HF principles and enables the identification of resources that will ensure training and operational effectiveness is maximised.

Scope

2. The HF assessment will identify the HF requirements (including consideration of manpower, personnel, training, human engineering, system safety and hazards), their implications on the alternative system concepts and will show how these factors may be optimised within the system designs. The following documents shall be produced:

   a. A Human Factors Integration (HFI) Plan.

   b. A HF systems analysis report.

Aim

3. The aim is to examine the HF options and define the requirements for PGMU. The proposal shall include, but not necessarily be limited to, the enhancement of human performance and reliability in the operation, maintenance and support of the system.

Reference Documentation

4. The assessment shall utilise Def Stan 00-250 (Human Factors for Designers of Systems, Issue 1 dated 23 May 08). Any non-compliance to standards will be discussed and the consequences outlined.

Planning

5. The contractor will prepare and maintain a HFI Plan.

HF Strategy

6. The relationship between the ILS elements of manpower and personnel, training and training equipment and the SA process with the HF domain will require close co-ordination to ensure comprehensive coverage of all requirements whilst avoiding duplication of effort. It is essential that the HF planning for each stage of the PGMU Programme considers the support arrangements for other stages and related equipment programmes.

7. The design of PGMU will be such that the physical and mental demands on the operator and maintainer and the potential for human error are minimised.

8. The Human Computer Interaction (HCI) must confirm to the Joint CIS Style Guide to ensure consistency and reduce training requirements.

Health and Safety

9. The MOD has no general exemptions from the provisions of the Health and Safety at Work etc Act 1974, the Factories Acts and regulations made under those acts. They are equally applicable to civilian and service working environments under peacetime operating conditions. Inspection, maintenance and repair procedures/instructions are

to comply with the requirements specified in the legislation. The MOD has produced the Health and Safety Handbook (JSP 375), which sets out its commitment to the proper implementation of health and safety legislation. In order to implement the Safety Case approach to equipment safety, the MOD has also produced Def Stan 00-56 - Safety Management Requirements for Defence Systems.

Activities in the D&M Phases

10. The HFI Plan for the D&M Phases shall identify the implications of the six HFI domains and describe how they will be accounted for in the PGMU system's design programme. The six domains of HFI are outlined below:

    a. **Human factors Engineering (HFE)**. HFE ensures comprehensive integration of human characteristics into system design, including all aspects of workstation and workspace design.

    b. **Manpower**. The number of personnel required and available to operate and maintain the PGMU system

    c. **Personnel**. The aptitudes, experience and other human characteristics, including body size and strength necessary to achieve optimum system performance.

    d. **Training**. Specification and evaluation of the optimum combination of: instructional systems; education; and on the job training required to develop the knowledge, skills and abilities needed by the available personnel to operate and maintain the product to the specified level of effectiveness under the full range of operating conditions (both in an exercise and operational settings). This area does not include Collective training which is the responsibility of the Front Line Command (FLEET).

    e. **System Safety**. The process of applying HF expertise to minimise safety risks occurring as a result of the system being operated in a normal or abnormal manner.

    f. **Health Hazard Assessment**. The process to identify and address conditions inherent in the operation or use of a product (e.g. vibration, toxic fumes, radiation, noise, shock recoil) which can cause death, injury, illness, disability or reduce the performance of personnel.

11. The HFI plan shall identify the HF integration activities to be undertaken, the timescales, the deliverables, the method and criteria for acceptance and the audit trail for HF decisions. Every task included in the HFI plan and the subsequent completion of those tasks shall be oriented toward maximising the operator's capabilities so that personnel can make the most effective operational use of the system. The HFI plan shall indicate how HF analyses shall be incorporated within the design cycle to optimise system design. The HFI plan shall indicate how HF trade-offs will be managed. The HFI plan shall indicate the extent and the means that sub-contractors will use to implement the requirements for HF integration. Finally, the HFI plan shall contain a brief statement describing the contractor's level of human factors effort, the functions of key personnel and their curricula vitae.

ANNEX E TO
PGMU ILSP

9 TRAINING AND TRAINING EQUIPMENT PLAN – ANNEX E

Introduction

1. The ILS element of Training and Training Equipment (T&TE) is principally concerned with the identification of new and/or modified training requirements to operate and support the PGMU capability. The Plan (as part of the ILS process) will include interim and steady state individual training (for both the operator and maintainer) and any equipment required to perform that training.
2. The approach to training for PGMU is that interim training will be based on the submission from contractors in response to each Lot. Steady state training will be developed by the Authority.

Purpose

3. This MOD T&TE Plan will form the baseline for all future T&TE planning. The T&TE element of the ILS Plan is principally concerned with ensuring that any new and/or modified training needs (equipment, courses and facilities) required to support PGMU are established in time for the Ready for Training (RFT) date.

4. The PGMU ILS Team, in conjunction with the PGMU Training Steering Group, will need to consider the following points when formulating the training plan:

   a. **The Scope and Depth of the Training Required**. Some information will be derived from the SA results that identify maintenance procedures. The Authority will determine the full training requirement for PGMU.

   b. **The Personnel to be Trained**. This may include instructors, maintainers, operators, suppliers, trials personnel etc. The Authority will identify how many personnel of each specialisation will require training.

   c. **Training Equipment**. The Authority has identified the training equipment required for PGMU based on existing training equipment.

   d. **Equipment Availability**. The availability of equipment, technical manuals and Support & Test Equipment (STE) prior to the start of training and preferably earlier to facilitate course development.

Aims

5. The aims of this T&TE Plan are to identify training objectives and tasks in order to:

   a. Confirm the division of responsibility between the Authority and Contractor for the development of the training solution.

   b. Provide the Contractor with sufficient information to enable them to propose an acceptable PGMU interim training solution. The data given in this plan should be used in conjunction with and be supplemental to the Training requirements detailed within the SOW.

Planning

6. The Contractor shall deliver a T&TE Plan as part of his ISP.

Meetings and Reviews

7. T&TE will be an agenda item for the LSC.

8. T&TE will be considered at all Design Reviews and SA Reviews.

Training Steering Group

9. A PGMU Training Steering Group (TSG) has been established and held its inaugural meeting on 13 Feb 13.

10. The TSG is effectively the lead for the Training DLOD and in terms of Capability Integration, reports to the Project Board.

Requirements

11. The Training Requirements for PGMU are detailed in the Systems Requirements Document and the SOW.

Training Development

12. The Contractor must include a schedule within their Training and Training Equipment Plan to demonstrate their proposal to achieve the Ready For Training Date (RFTD).

13. Acceptance of the Contractor's interim training solution by the Authority will be achieved when all training deliverables have been successfully demonstrated to the User at HMS SULTAN and endorsed by the TSG.

14. PGMU Operator and Maintainer Steady State training will be delivered by uniformed staff at HMS SULTAN.

15. The Contractor will submit a costed proposal for the delivery of PGMU Operator and Maintainer interim training, as detailed in the SOW. The proposal will include development and delivery of the following interim training courses:

- Operator Course for instructional staff;
- Maintainer Course for instructional staff;
- First of Class Operator Course;
- First of Class Maintainer Course.

16. The Contractor should be prepared to support the Authority during the development of the steady state training solution.

Training Material

17. The Contractor will produce training media to include the following:

- PowerPoint presentations;
- Job Sheets – To facilitate practical consolidation of each topic using the agreed training solution;
- Instructor Guides – To be sufficiently detailed to act as a comprehensive instructional reference guide for the entire course;
- Student Guides – To be sufficiently detailed to act as a comprehensive student

reference for the entire course;

- A0 size laminated block diagrams for major sub-systems, schematic diagrams, and functional block diagrams to be used as maintainer instructional aids;
- A3 bound fold-out sheets of the above diagrams for instructor use and student reference guides.

18. The Contractor will deliver all training material in a format that can be updated by the Authority.

19. The Contractor will provide free licence to the use of all training and support documentation.

20. The Contractor will identify how the training solution will be supported through life, including updates to trainer hardware, software and training documentation.

The Contractor will update the Training Plan in accordance with the DRL.

Training Steering Group

21. The TSG is responsible for ensuring that the training requirements to support the acquisition are identified and met. It is required to perform the following tasks:

a. Develop and maintain this T&TE Plan.

b. Conduct or quality assure studies if required (e.g. evaluations of existing training).

c. Brief potential contractors and act as a point of contact for any requests for information or subject matter expertise.

d. Assess/quality assure the recommendation of the most cost-effective steady state training solution.

e. Assist the design and implementation of the chosen training strategy.

f. Participate in the acceptance tests for the training equipment (if required).

g. Conduct /quality assure content of the Training Evaluation.

22. **Timing of Training**. Training will likely be first required for the trials teams, those taking part in Logistic Demonstrations and Ease of Maintenance Assessments in the PGMU D&M Phase. The TSG and LSC should ensure that the contractor's training plan will deliver the right training at the right time.

ANNEX F TO
PGMU ILSP

10 LOGISTICS DEMONSTRATION (LOG DEMO) PLAN – ANNEX F

Introduction

1. In addition to progressive assurance as provided through the Supportability and AR&M Cases, a Logistic Demonstration (Log Demo) will be required to provide assurance that PGMU is both supportable and supported. The Authority will select a series of System Requirements, and the Provider will need to demonstrate that these have been met.

2. A Log Demo or Supportability Assessment will be essential to ensure that all support elements are available, to the required specification and in sufficient quantity to enable the PGMU capability to be supported.

3. In addition, an assessment of ILS elements will take place during the Demonstration Phase (DM). This might be in the form of Ease of Maintenance Assessments (EMA) which are aimed at providing assurance that maintenance activities can be carried out effectively by using the associated Technical Documentation, Support & Test Equipment, Facilities, Training etc.

Purpose

4. The purpose of EMAs and the Logistic Demonstration is to validate the support system procured for PGMU.

Scope

5. The Log Demo Plan will describe the MOD's approach to test, evaluation and verification for PGMU. The Plan is to be developed by the contractor and proposed to the MOD for contracted implementation starting in the Demonstration Phase.

Aim

6. The aim of this plan is to raise awareness of the requirement for EMAs and a Log Demo to the Contractor to ensure that a preliminary set of demonstration requirements, including quantitative definitions, for all support elements of the PGMU system are identified and incorporated into a Log Demo Plan.

7. It is essential that requirements are clearly defined and measurable. Where the Contractor perceives a requirement that is not measurable he must notify the MILSM immediately. Test and evaluation methods must be affordable. In circumstances where the Contractor perceives a test or evaluation is not cost effective alternative methods are to be proposed.

Demonstration Phase

8. The activities to be performed in the demonstration Phase include:

   1) Formulating a test and evaluation strategy to ensure that specified supportability and supportability design requirements, including software support requirements, are achieved or achievable. Include this as part of the ITEAP.

2) Develop a draft list of support resources to be evaluated during the Log Demo.

3) Establish the quantitative criteria for assessment of support resources during the Log Demo.

ANNEX G TO
PGMU ILSP

11 WHOLE LIFE COST (WLC) PLAN – ANNEX G

Introduction

1. Whole Life Costs (WLC) identify the system or product costs across all stages of acquisition. A WLC Plan is to be provided by the Contractor as part of the Supportability documentation. It will detail the means by which the Contractor intends to plan for minimised acquisition and support costs throughout the life of the equipment. The objectives are to:

    - Model the significant, supportability related, cost elements of PGMU through life;
    - Influence the decisions/selection of alternatives based on the whole life cost;
    - Inform the planning for expenditure on through life support;
    - Inform the monitoring and controlling of expenditure on through life support.

2. The WLC strategy is based on developing a single WLC and TLF model for PGMU.

Aims

3. The aim of ILS is to ensure that both the equipment design and the support solution are optimised for the most cost effective delivery and support of the PGMU solution.

4. The early aims of the PGMU WLC programme, using Life Cycle Costing techniques, is to identify the major cost drivers so that analysis can be applied to identify ways to reduce the costs associated with those high cost drivers in order to minimise WLC.

WLC Model

5. MOD CAAS have provided (as part of the ITT) a template to be populated by the Contractor, which will feed into the CAAS Whole Life Cost Model.

6. During the In-Service Phase, the WLC data shall be updated by the Contractor following the impact analysis of in-service data.

7. The high cost drivers shall be addressed (as applicable) in the PGMU solution to ensure that any reliability and sustainability issues are investigated. The aim will be to minimise whole-life support costs.

ANNEX H TO
PGMU ILSP

12 OBSOLESCENCE MANAGEMENT PLAN – ANNEX H

Reference:

A. British Standard (BS) 62402:2007 – Obsolescence Management Application Guide. (It should be noted that the BS is identical to the International Standard for Obsolescence Management)

Introduction

1. Obsolescence, as defined in BS 62402:2007, is the 'transition from availability from the original manufacturer to unavailability' and Obsolescence Management (OM) is 'the co-ordinated activities to direct and control an organisation with regard to obsolescence'.

2. The objective of OM is to ensure that obsolescence is managed as an integral part of design, development, production and in-service support in order to minimise the financial and availability impact throughout the product life cycle.

3. This Obsolescence Management Plan (OMP) details the activities that the PGMU project will take to identify and mitigate the effects of obsolescence to ensure that obsolescence has no detrimental impact to availability or capability of the PGMU system.

Aim

4. The aim of this plan is to establish the Authority's strategy and requirements for the obsolescence management of PGMU systems and equipment for the planned is service period of 20 years.

Approach

5. The contract for OM will be set using the MOD's Commercial Policy Statement Version 1.2 dated 01 July 2011.

Contracting For Obsolescence Management

6. One of the most important aspects of OM is to ensure that the requirement is clearly defined commercially and it is clear who is liable for the cost of resolutions of obsolescence issues. In the case of PGMU, the Contractor will be responsible for the resolution of obsolescence issues in accordance with the SOW.

7. The contractor will be required to perform the following activities in accordance with BS EN 62402:2007:

    a. In the course of the design of an equipment (where applicable considering the COTS nature of PGMU), the choice of materials, products, technologies and interfaces shall be made in order to minimize the risk to the equipment of future obsolescence. Factors to be taken into account will include current market, regulations, technology roadmaps and appropriate component selection.

b. A risk assessment shall be carried out to determine the risk to the equipment from obsolescence. The recommended method of conducting the risk assessment is the use of the triplet of Probability, Impact and Cost as described by BS 62402:2007. The result of this assessment will determine the category of risk (low, medium or high).

c. As a result of the risk assessment, either a reactive or proactive approach to the obsolescence risk shall be employed for each item.

(1) Reactive – This approach shall be employed where the result of the risk assessment is in the 'low' risk category. This option entails doing nothing until an obsolescence issue arises, where an appropriate and cost effective resolution to the problem is implemented.

(2) Proactive – This approach shall be employed where the result of the risk assessment is either in the 'medium' or 'high' risk category. A suitable method, aligned to the severity of the risk, to reduce the impact of obsolescence shall be selected.

8. Obsolescence Management will be carried out in accordance with BS EN 62402:2007. The term 'obsolescence' is used generically to cover the increasingly problematic subject of components, assemblies, subsystems and systems becoming unobtainable during the usable life of the product. It can affect all forms of equipment, software, tools, processes, support products, standards and specifications, and impacts upon all stages of the life of equipment. It is essential, particularly given that the most of the PGMU system elements will be COTS, that obsolescence is rigorously applied and effectively managed in order to maintain the PGMU capability. The PGMU obsolescence strategy will be based on a pro-active approach which will require that an obsolescence management process is developed and implemented to ensure that potential obsolescence problems are mitigated before they occur.

9. The contractor shall be responsible for Obsolescence Management and shall be expected to maintain a database of all system elements. The database shall be used to predict the likely lifetime of the product and prepare alternative mitigation actions in advance of any component obsolescence.

10. The status of material used in the manufacture of each sub system shall be identified, stored and controlled using industry Product Data Management (PDM) systems. The information systems shall be used throughout the supported PGMU life-cycle. They shall provide a data warehouse for obsolescence information that can be applied at component, sub-assembly and systems level to produce acquisition risk analysis, system health monitoring and, when appropriate, manage material substitution.

11. Management decisions such as the implementation of a new design, utilisation of legacy systems or a combination of both options, depending on the suitability, cost implications and status of each LRU supported, shall be implemented for the PGMU solution. By adopting a pro-active approach, the contractor will be mitigating the risk of obsolescence. For either of these options, a number of strategies may be implemented in order to overcome impending obsolescence:

a. **Design Considerations** – considering the future obsolescence issues during the design process in order to minimise its possibility of occurrence.

b. **Procurement Strategy**. At initial procurement extra quantities of critical components are procured to support the life or the defined life interval of that equipment. An “All Time Buy” of critical or essential items for defined manufacturing and support requirement can be initiated 'just in time' providing close relationships with suppliers are maintained.

c. **Delayed Procurement.** Delayed implementation of COTS equipment procurement to take on technology at the latest practical date.

d. **Technology Refresh.** For COTS items such as Personal Computers, plan a regular technology refresh on a periodic basis through life to reflect historical trends.

e. **Technology Insertion.** Programme plans are developed to review and upgrade equipment at defined intervals within the in-service life cycle of the equipment. With this strategy, the management of associated obsolescence issues can be dealt with at the time of upgrade. This requires that all obsolescence arising are managed up to the time of the technology insertion, i.e. a defined life interval. Incremental Development may also offer the opportunity to improve functionality and reliability.

f. **Obsolescence Monitoring** - If a proactive OM approach is being used it will be expected that the minimum requirement for this approach would be a form of obsolescence monitoring activity. This could range from referring to technology roadmaps to component monitoring tools. With regards to obsolescence monitoring, the contractor’s OMP should give;

(1) Detail of level that monitoring will be conducted (*assy, LRU, component etc)*

(2) Detail of who will be doing the monitoring

(3) Detail of how the monitoring will be conducted (*tool, process etc)*

(4) Detail of how the results will be communicated (*means & frequency*)

g. **Obsolescence Impact Assessment**. Monitor and analyse periodically the materials requirement resulting from pending obsolescence.

12. The British Standard contains a useful list of strategies to apply to resolve obsolescence. Listed below is a typical explanation of where these might apply:

a. **Do nothing.** High reliability systems with limited operational life, low cost, funded PDS support, and resource ready to provide reactive obsolescence management.

b. **Last time buy.** Defined reliability, low/medium operation life, redesign constraints, and known support obligations to be able to confidently predict purchase quantity.

c. **Recommended alternative parts.** Obsolescent/obsolete parts given one or more alternative devices, successful if the balance of a design remains supportable.

d. **New designs.** No part available or supportability/reliability warrants redesign.

13. These strategies are not exclusive and can be applied to the same design concurrently or serially. They apply to components, sub-systems, and systems equally and to COTS and MOTS products.

Developing the OM Plan

14. This OM Plan will develop into a stand alone Obsolescence Management Plan which will be produced by the PGMU contractor and be based on the 'Generic OM Plan Template' issued by the MOD's Obsolescence management team.

15. It will be required to be drafted during the D&M Phase and include the following areas:

a. Project Details

b. Scope of Plan

c. Obsolescence Management Organisation

d. Risk Assessment

e. Obsolescence Management Approach

f. Obsolescence Monitoring

g. Resolution Process

h. Supplier Arrangements

i. Performance Management

j. Plan Transition

ANNEX I TO
PGMU ILSP

13 SUPPLY SUPPORT PLAN (SSP) – ANNEX I

References:

A. JSP 886 Vol 7 Part 8.10 (Supply Support Procedures)
B. BRd 2002 (Maritime Operational Logistics).
C. JSP 886 Vol 3 Part 2 (VFMB).

Introduction

1. The ability to maintain operational readiness under all conditions depends upon the availability of the correct supplies at the time and place they are needed. Supply Support is an essential element of ILS and is responsible for the timely provisioning, distribution and replenishment of spares, repair parts and special/consumable supplies.

Scope

2. This Plan aims to provide sufficient information to enable the contractor to provide spare parts information and support requirements for PGMU.

Purpose

3. The purpose of the Supply Support Plan is to identify the supply support requirements and objectives in order to:

   a. Provide sufficient information to enable the Contractor to provide an acceptable Supply Support Plan, and ultimately supply support system which sustains the PGMU capability;

   b. Confirm the division of responsibility between the Contractor and the MOD.

Aim

4. The aim of the Supply Support Plan is to identify the probable range and scaling of spares required and to determine the optimum method of future spares procurement to support the PGMU system for peacetime training and when deployed on operations.

Responsibilities

5. The PGMU MILSM will act as the focal point for all supply support matters for PGMU, with assistance from the LSC Supply Support SME.

Meetings and Reviews

6. The SSP will be an agenda item for the LSC. SSP implications will be considered at all Programme Reviews and SA Reviews.

Contractor's Supply Support Plan

7. The Contractor shall submit a Supply Support Plan (SSP) as part of the delivered ISP.

8. Supply Support studies during the D&M Phase shall concentrate on the acquisition and validation of Supply Support data for each of the PGMU elements and the identification and evaluation of Supply Support options.

9. The Contractor shall be contracted to develop procedures for Supply Support that optimises through-life cost by promoting the efficient management of inventories and the provision of spares.

10. The Contractor's spares recommendations shall be derived from the SA Data.

11. The Plan will explain the contractor's management activities, process and methods which will identify the optimum supply support arrangements including the optimum range and scale of spares required to support and sustain the PGMU system, provisioning documentation, NATO codification, etc.

12. The following supply support topics areas will need to be addressed and plans formulated prior to the LSD:

    a. Repairable spares;

    b. Non-repairable spares (consumables);

    c. Initial spares;

    d. Re-provisioning;

    e. Ranging and Scaling;

Inventory Optimisation

13. In order to ensure that the contractor's spares holdings proposals are valid and cost effective, the JSC SCM Supply Chain Optimisation (SCO) Team will carry out a peer check of the contractor's spares and simulation models.

14. The SOW specifies that the contractor is to use the following models for spares calculations:

- OPUS 10 – a computer model for solving Logistic Support and Spares Optimisation problems. It provides comprehensive and relevant outputs with many measures of effectiveness, several crucial WLC elements, cost/effectiveness curves and tables as well as the optimal spares assortments and allocations.

- SIMLOX - SIMLOX is an event driven simulation tool that enables detailed analyses of how technical system's performance vary over time given different operational and logistics support scenarios. Based on availability of maintenance resources, maintenance strategy and the operational profile, SIMLOX makes it possible to get very realistic simulations of systems operational efficiency. This includes identification of bottle necks and other factors having a negative impact on efficiency.

  A central functionality in SIMLOX is the ability to illustrate how the outcome varies over time, taking into account changing operational demands as well as changing resource availability and transport schedules. It is primarily in this context SIMLOX can be seen as a complement to OPUS10. These two software tools are closely related and uses the same input data to a high degree. The following areas are examples where SIMLOX add functionality in comparison with OPUS10:

  - Different mission profiles with variable utilization
  - Mission prioritization
  - Mission controlled generation of failures/damages
  - Maintenance resource and constraints
  - Preventive maintenance
  - Mission damage

- Cannibalization/robbing
- Non-critical and critical failures
- Deferred maintenance and repair
- Lateral or flexible support
- System variants
- Batched transport
- Transfer of systems, items and resources

15. The contractor will be required to submit the completed models, with underlying assumptions and pricing details, to the JSC SCM Supply Chain Optimisation Team.

Validation and Verification of Initial Spares Recommendations - DEFCON 82 Data Set

16. DE&S Project Teams need to procure data to verify and validate contractors' initial spares recommendations. Much of this data is output during supportability analysis and is potentially held within the contractors' support information systems.

NATO Codification

17. All spares identified for Service use and that will be demanded and move through the Joint Support Chain (JSC) shall be NATO codified. This process is an essential Supply Support tool that reduces the cost of procuring spares by avoiding duplication in the Service inventories.

18. NATO Codification in the UK can only be conducted through UK NCB by NCB approved codification contractors, and a manufacturer/supplier providing equipment and spares can only be contracted (paid) to submit requests and provide source data (in accordance with DefCon 117) to UK NCB utilising NCB's eTasking system. On receipt of a request, UK NCB then allocate the work to one of their approved contractors (who are paid) or forward the requests through a NATO system to the appropriate foreign NCB if items are of foreign design.

Single Item Ownership

19. Once the required items are identified as being applicable to the PGMU system, if they are commonly used items, a decision will be made with the current user/owner of the item as to which team will take ownership of the item in terms of management, reprovisioning, ranging and scaling etc.

Reverse Supply Chain (JSP 886)

20. Any supply support option and the eventual PGMU supply support solution, will include both the outward supply policy and the policy by which repairables are returned through the repair loop back to industry for repair/disposal.

Initial Provisioning (IP)

21. The full range and scale of spares and consumable items required to support initial equipment must be available to the supply system for a minimum of 2 months prior to the LSD. Consumable items are to be selected from those currently in use within the services or agreed with the MILSM. For ranging new equipment, common items are to be drawn from the Common Item Catalogue, maintained by UK NCB, rather than developing new items separately codified.

22. The provisional IP list will be produced by the contractor and submitted to the MOD for approval prior to IP procurement activity.

Fuels, Lubricants & Industrial Gases

23. Legislative, safety, technical and operational/logistical requirements need to be considered when selecting, transporting and handling fuels, lubricants, industrial gases and similar fluids. SFG216 is the SME and Naval Authority for Naval fuels, lubricants and associated products, while the Defence Fuels and Food Services (DF&FS) Team in DE&S is the procurement authority in this area. The support solution must have the approval of SFG216 and also be consistent with DF&FS requirements.

24. In terms of fuels, lubricants gasses and associated products, the Support Solutions Envelope GP 3.6 advocates that the use of any alternate fuels or lubricants is not allowed and that those products existing are mandated subject to any agreement to the contrary by the Authority. Any alternatives proposed will not normally be considered unless they are MoD approved Joint Service Designated Products (JSDP), as given in DEFSTAN 01-5. It is possible to specify the use of other products currently procured, but only in exceptional circumstances will new products be introduced.

25. Any proposed products shall comply in all respects with the Montreal Protocol Treaty of 1987 and the Kyoto Protocol 1997.

26. Any changes to Fuels and Lubricant items will be selected from DEFSTAN 01-5 and new items, disposals and obsolescence of Fuel and Lubricants are cleared through DF&FS. An alternative to diesel engine lubricating oil OMD-113 (NATO 0278), controlled by DEF STAN 91-22, will be not be used without the agreement of DF&FS.

Supply Support Activities

27. The contractor will deliver a Supply Support plan (as part of the delivered ISP).

28. The JSC SCM Supply Chain Optimisation (SCO) team will engage with the Contractor within applicable commercial restrictions to ensure that the appropriate tools, methodology and systems approach are being maintained. Where appropriate, SCO will also assist with the crafting of KPIs specific to spares modelling and optimisation activities.

29. Determine significant spares requirements (e.g. long lead items, high value spares etc.).

30. Identify risks and assumptions associated with spares requirements derived above.

31. Prepare a draft initial spares list (including hardware, firmware, transfer media and backup copies of software) from the Task Inventory for the new equipment.

32. Proposed fuels and lubricants consumption data will be captured in a spreadsheet which will be compiled during the Demonstration Phase. The list will need to include, as a minimum, the NSN, Description, Specification and an estimated annual requirement. It will be forwarded to the DF&FS SSE GP3.6 SME for review.

33. The proposed inventory results from the contractor will be submitted to the Authority's Supply Chain Optimisation Team to validate the results.

Activities to be completed prior to LSD.

34. Contractor prepares and delivers provisioning list to the MOD for review.

35. Contractor carries out NATO codification of agreed list.

36. Contractor prepares Illustrated Parts List and incorporates it into the Technical Documentation (User and Maintainer manual).

Maritime Supply Chain

Reference:

BR 2002: Maritime Operational Logistics Volume 1.

37. This section covers the supply of consumable and repairable spares to RN units and also the return of repairable spares (the reverse supply chain or what is commonly referred to as the ‘backloading‘ part of the ‘repair loop’).

38. The HQs involved with supply issues are as follows:

    a. Strategic Base (UK) - PJHQ (J4)

    b. Joint Operations Area (JOA):

        (1) HQ JFLogC

        (2) HQ JTF

39. There are several nodes involved in the supply of technical spares (this includes the return of repairable spares) to ships. The End to End (E2E) supply chain includes the following organisations/agencies (which are also depicted in Fig 1 below):

    a. Industry (those industrial partners with which a contract has been established for the supply of consumable and repairable spares).

    b. Joint Support Chain Services (JSCS) nodes which includes:

        (1) The primary Purple Gate which is the point to which all operational spares should be delivered and is located at JSCS Bicester. If circumstances dictate, equipment can be delivered to the following secondary PG locations (with authority from the Defence Supply Chain Operations and Movements (DSCOM)) for onward movement):

[redacted]

    c. RFA ships which are provisioned initially at Marchwood military port or in theatre with supplies initially delivered to the Air Point of Disembarkation (APOD), Sea Point of Disembarkation (SPOD) or a well found foreign port. RFAs hold stocks of technical spares to support ships, weapons and equipment in the JTF in the JOA.

    d. Helicopters operating from the APOD, SPOD or Forward Logistic Site (FLS) directly to the ship.

    e. Resupply boats delivering spares direct from the SPOD to the ship.

    f. [redacted]. Spares are then transferred to a Forward Logistics Site (FLS) which may be eco-located with an APOD (but not always) and are then transported to the maritime unit using a form of Maritime Intra-Theatre Lift (MITL). MITL could take the form of a Rotary Wing asset, potentially co-

located with an FLS, MARS Tanker, FSS, fixed wing asset, other surface vessel or Air Ship.

Fig 1 – Maritime Supply Chain

40. Consolidated Allowance List – ships are allocated an amount of spares (and other commodities) based on failure rate and allowable storage space on board. The approved list is termed the Consolidated Allowance List.

41. All demands made by the end user (ship) on MJDI will specify a Required Delivery Date (RDD).

42. Repairable spares usually enter the Joint Support Chain (JSC) and will be sent to a unit via air or surface, usually arriving at an APOD or SPOD. At this point an FLS or Port Agency Contractor would arrange for onward movement to the maritime unit using a form of MITL. The form of MITL used depends on the availability of MITL assets and the speed at which the spares are required.

43. Reverse Supply Chain - Any supply support option will include both the outward supply policy and the policy by which repairables are returned through the repair loop back to industry for repair/disposal. Repairables are usually retained on the ship until return to UK where repairs are then carried out. However if spares are in high demand, have been requested through another unit on MJDI and authorised for transfer or are required as part of a contracted support solution, the reverse supply chain can be activated in order to send items back to the UK. This is done through an FLS or Port Agency Contractor, or a mixture of both, which will receive items from maritime units from MITL assets, co-ordinated by a Task Gorup Group Logistics Co-ordinator (GLC), and will then plan for onward movement to the UK using either APOD or SPOD military assets, or, where appropriate, commercial air.

Logistic Information Systems

44. The Logistics Information system used at the various locations and agencies/organisations is MJDI or other future Logistics IS system.

ANNEX J TO
PGMU ILSP

14 SUPPORT AND TEST EQUIPMENT PLAN – ANNEX J

References:

A. JSP 886 Vol 7 (Supportability Engineering): Part 8.06 Test Equipment, Part 8.07 Support Equipment, Part 8.17 Calibration

B. JSP 509 (The Management of Test Equipment): available on the Deployable Infrastructure Team website

C. Def Stan 05-55: Measurement and Calibration System Requirements for Ministry of Defence Test & Measurement Equipment.

Introduction

1. Support and Test Equipment (STE) is a principal element of the ILS Programme and is concerned with the identification, documentation and procurement of support equipment, test equipment and tools to support PGMU in time for the Logistic Support Date (LSD).
2. The S&TE Plan will form the baseline for all planning, co-ordination and implementation of all work associated with STE identified by the Contractor.

Purpose

3. The purpose of the STE Plan is to identify STE requirements related directly to the support of PGMU.

Scope

4. This plan covers all such equipment required to support PGMU in-service and includes Automatic Test Systems and Test & Measurement Equipment and the calibration of such systems. STE falls into 2 types and 3 categories defined as follows:
    a. The two types of STE are:
        (1) **General Purpose (GP)** - General Purpose STE (GP STE) is common to more than one main equipment system or has been introduced into service to support a single equipment but may be suitable for other Project Managers to use in support of their equipment.
        (2) **Special Purpose (SP)** - Special Purpose (SP STE) is that STE which is procured for a single equipment or system and is not suitable for use to support other main equipment or systems.
    b. The three categories of STE are:
        (1) Tools.
        (2) Test and Measuring Equipment.
        (3) Other Support Equipment.

Purpose

5. The purpose of the STE element is to identify potential STE solutions to meet the requirements for PGMU (based on the support strategy) and conduct trade-off studies to determine the most effective and economic STE.

6. The aim is to ensure that if additional test equipment is required, that it is procured from the current MOD inventory detailed in JSP 509 in conjunction with liaison with the Deployable Infrastructure team.

Meetings and Reviews

7. STE will be an agenda item for the LSC. STE implications will be considered at all Design Reviews and SA Reviews.

8. The contractor will be required to submit a recommendation of the optimum STE required to support the recommended maintenance plan.

STE Strategy

9. The Contractor is to identify the most cost effective solutions to support the agreed maintenance policies. Specifically, the requirement for STE at all levels of maintenance is to be kept to a minimum. Maximum use is to be made of STE currently in-service and where an additional requirement for STE is identified it must be fully justified.

10. Test equipment should be limited to that currently already used by the Authority and held at current maintenance locations. Where an additional requirement for test equipment is identified this should be selected from the Authority's inventory of Test Equipment.

11. Where a particular design feature requires special to system tools and test equipment this must be fully justified in terms of performance, R&M and WLC.

12. The Contractor shall ensure that any STE required to be deployed operationally in support of the PGMU system can be operated under the environmental conditions as specified for PGMU without modification or special to condition adaptation.

13. Test and Maintenance equipment should utilise approved Ships power distribution networks, i.e. 440V or 115V and not 240V.

14. Maximise use is to be made of in service, centrally acquired and managed, GPTME to satisfy any new test requirements.

15. The current MOD inventory of test equipment is contained in JSP 509 and includes some 8000 items. DES LE GSG-DI-GPTME is to be consulted once any additional requirement for test equipment has been identified to ascertain whether an item on the MOD inventory already exists.

16. The contractor shall also address the calibration of any items of test equipment which require such calibration through life.

Automatic Test Systems (ATS) and Test and Measurement Equipment

Procurement and Funding

17. ATS procurement is the responsibility of individual Delivery teams and such procurement will be subject to Acquisition Operating Framework (AOF) principles, Support Solutions Envelope guidance, together with the information given in Reference A (JSP 886, Vol 5 Part 1).

18. ATS must be capable of evolving with technology and emerging requirements and this is particularly relevant in the General Purpose ATS (GPATS) area. Inability to extend the parametric test envelope to encompass new test requirements might force projects to replace the existing ATS with a Special to Type ATS. Therefore, the

Contractor shall ensure that all ATS test solutions are developed around open architecture systems.

19. Another issue which shall be considered is that of IPR. The adoption of an open system approach will ensure that application software will be produced in a language that is non-proprietary and as such will be easier to re-host on any system changes which emerge from the inevitable obsolescence issues which will arise during the life of the ATS. The move towards CLS contracts, which will apply to PGMU, also makes IPR an important issue. It is MOD Policy that any such contracts placed must have clear exit strategies for both parties. Such strategies will only be effective if MOD has access to all the data necessary to resubmit the contract to Tender action. PGMU will have a Support Continuity Strategy to cover this issue.

20. All potential PGMU ATS procurement will be referred to DES SE TLS-TM-ATS who will provide advice on the choice of ATS architecture to be used. The PGMU MILSM will consult with TM-ATS (SSE GP 2.4 SME) at the earliest opportunity in order to obtain assistance in identifying suitable ATS either already in use or those about to enter service. PGMU will not embark on any ATS procurement without considering sharing test platforms with other projects. It is understood that if this is managed properly, there should be little or no need to procure additional capability unless there is no other way of satisfying the operational requirement.

21. It is likely that the PGMU support solution will include a CLS contract under the Surface Ships Support Alliance. In this instance, the PGMU MILSM will ensure that the ATS complies with the requirements of JSP 886, Vol 5 Part 1, noting that if this is not achieved then the Authority will be unable to realise effective exit strategies from any such CLS contracts.

Automatic Test Systems (ATS) Introduction into Service

22. The maintenance policy for any new ATS will be produced in accordance with the Supportability Analysis processes. It will be the responsibility of the Authority to determine, fund and arrange the maintenance and support of the ATS. The PGMU project will ensure that the repair and calibration arrangements are well defined and established before the in-service date for the ATS. This will be including as an LSD criteria. If PGMU uses existing ATS, then funding of maintenance and support activities may be provided by/negotiated with the appropriate ATS owner.

23. All supply management activity (including requisition action) associated with the procurement and support of ATS is the responsibility of the PGMU project.

Calibration

24. The design and construction of TE and ATE varies considerably according to the application it supports and therefore each TE and ATE will have its own particular calibration and maintenance requirement. These will be established by the ILS/SA processes. However the calibration will conform to the quality requirements laid down in JSP 886 Vol 7 Part 8.17 and JSP 509 and follow the guidance in Def Stan 05-55.

25. Calibration will be arranged to be carried out at the most convenient location which include the following:

    a. Defence Support Group (joining of what was ABRO (mechanical) and DARA (Electrical))
    b. Northern Calibration Facility (NCF) HMNB Clyde
    c. Overseas (MOD In-Theatre Calibration laboratory) - Joint Logistic Unit, HMNB Gibraltar
    d. Industry

Configuration Management

26. Technology, test and measurement techniques, capabilities and requirements may all evolve during the service life of the ATS and the equipment being tested. The need for ATS in general, and GPATS in particular, to meet new or changed customer requirements will inevitably mean that such ATS will be subject to a number of changes to hardware and software and this issue needs to be carefully managed.

27. It is understood that effective Configuration Management between ATS, TPS and dependent prime equipment is critical and will be managed as such. The test system will only work effectively if compatible build standards are employed.

Procurement of GPTME

28. To avoid unnecessary proliferation of GPTME used within the MOD and to gain the benefits of centralised procurement, provisioning and re-provisioning for GPTME is to be conducted by the Deployable Infrastructure (DI) Team. Alternatively the PGMU project will be required to demonstrate that their own sourcing is more cost-effective for the MOD as a whole. When provisioning or re-provisioning to meet a new requirement, the PGMU project will make sufficient funding available to DI to purchase and initially support the item.

29. Re-provisioning to meet established ongoing requirements and long term support is the responsibility of DI.

30. Provision of GPTME by DI to meet a new or additional requirement will be achieved by one of the following methods:

    a. Using GPTME from a range that is currently in-service, by arranging an issue from stock or by obtaining additional stock for issue by taking re-provisioning action.

    b. Procurement of suitable GPTME from trade, where the item has not previously been held in inventory.

    c. Development of a new model of GPTME.

Through Life Costing

31. It is MOD Policy to minimise through-life costs, and one aspect of this policy is the reduction in the proliferation of TME through the greater utilisation of GPTME. PGMU shall maximise the use of GPTME as opposed to SPTME, and only use SPTME after seeking advice from DI.

32. The PGMU MILSM will address GPTME through-life issues by liaising directly with DI. DI will monitor through life costs and when GPTME is declared beyond economic repair, will initiate disposal and replacement action.

33. The PGMU project shall obtain advice on the selection of TME from DI prior to making a final selection decision. To allow DI to determine the most appropriate GPTME to meet a test or measurement need, the PGMU project shall describe the requirement using performance specifications, rather than quoting a particular manufacturer's model type.

Activities prior to LSD

34. The contractor shall prepare a STE list (including ATS, ATE, GPTME and SPTME) from the task inventory for the new equipment.

35. The MILSM will document the results in the Support Policy Statement.

36. The contractor shall deliver the STE requirements to meet the planned LSD.

LSD Criteria

37. The following requirements will need to be met prior to LSD being declared as achieved:

    a. The required STE must be approved and demonstrated.

    b. STE must be issued to the FOC PGMU ship.

    c. The STE must be specified and described in the appropriate PGMU Technical Documentation.

    d. The calibration plan for the STE must be defined and implemented.

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ANNEX K TO
PGMU ILSP

15 FACILITIES PLAN – ANNEX K

Introduction

1. The term 'Facilities' includes all the physical infrastructure required to integrate, operate, store and maintain the equipment. The facilities requirements will be identified through the SA process and will be recorded in the LIR. This will show their relevance/justification, specification and cost. There will be close links with STE and training elements which may also require facilities.

2. It is assumed that only existing facilities will be required to Support PGMU. The purpose of the Facilities Plan is to ensure that all facilities required to support the PGMU capability are correctly identified, documented and if necessary, procured. The identification of the facility requirements will be compared with the existing facilities within the user community to identify any new or modified requirements that would constitute an additional cost or logistic load.

3. The Infrastructure DLOD, clearly has an interest in this ILS element and engagement will continue to ensure that infrastructure requirements emerging from this element are addressed and covered by the Defence Infra Organisation.

Purpose and Scope

4. The Facilities element of the PGMU ILS Plan is principally concerned with ensuring that any new and/or modified facilities required to support the product are established/built/made available in time for the Logistic Support Date.

Aim

5. The aim of the Facilities activity is to identify potential facilities requirements and conduct trade-off studies to determine the most effective and economic facilities requirements.

Planning

6. The planning for any new facilities which are required should be addressed by the Infrastructure DLOD (with the PGMU MILSM being a member).

7. The Contractor will be required to provide a Facilities Plan as part of his Integrated Support Plan.

Meetings and Reviews

8. Facilities will be an agenda item for the LSC. Facilities implications will be considered at all Programme, Design and SA reviews.

9. The requirement for facilities must be kept to a minimum. Additional facilities required to support PGMU shall be identified and costed by the contractor/defence estates during the D&M Phase.

10. Facility issues will be fed into the Infrastructure DLOD by the PGMU MILSM.

Activities prior to ISD

11. It is envisaged that likely facility requirements for PGMU may include:

    a. Spares storage area;

    b. STE storage area;

    c. Training buildings and classrooms;

    d. Repair facilities (MOD and contractor) – secure/non secure.

ANNEX L TO
PGMU ILSP

16 PACKAGING, HANDLING, STORAGE AND TRANSPORTATION (PHS&T) PLAN – ANNEX L

Reference:

A. JSP 886 Vol 7 Part 8.02 Packaging for the Handling, Storage and Transportation of Materiel.

Introduction

1. In order for MOD to procure materiel in an economical manner, the type of packaging most adequate to the requirement shall be chosen. Where commercial packaging is acceptable this shall be used. However it should be pointed out that this may be suitable only for delivery purposes and the contents may have to be overpackaged if not used immediately or if subsequently held in store.
2. PHS&T includes the resources, procedures, design considerations and methods necessary to ensure that all product and support items are packaged, handled, stored and transported properly and in conformance with appropriate legislation, particularly for hazardous materials. This includes environmental limitations, product preservation requirements for short and long term storage, the handling of items during repair tasks and transport requirements.
3. PHS&T planning shall be carried out in accordance with the requirements of Def Stan 81-41 (Packaging of Defence Materiel) which is in 6 parts, DEFCON 129 and DEFFORMs 96 and 111 (noting that in DEFFORM 111 that DPkgA in Box 3 is replaced by the PT's details).
4. PHS&T policy, defined in Reference A (JSP 886 Vol 7 Part 8.02) is set by DES JSC TLS-Pol-Pkg.

Packaging

5. The aim of packaging in defence is to ensure that materiel is received safe and fit for purpose by the ultimate user by providing appropriate environmental and physical protection throughout the Support Chain.

6. The contractor will be required to identify suitable levels of packaging, in conjunction with the Def Packaging Group.

7. Packaging shall be designed and manufactured in compliance with Def Stan 81-41 in order to meet the requirements of Military Level Packaging (MLP). The Standard contains a glossary of packaging terms, sets out general service requirements, defines technical methods of meeting them, provides package testing methods and prescribes documentation, including all labelling requirements of military package design.

8. Design and manufacture shall be undertaken by a contractor who is registered in the Defence Packaging Group's (Def Pkg Gp) Military Packaging Capability Accreditation Scheme (MPCAS), or who is able to demonstrate that his quality assurance arrangements and military package design expertise are of an equivalent standard. (Details of the MPCAS are published in D Pkg A/DR-14 (Part 1) 'Military Packaging Capability Accreditation Scheme' and companies which have been granted Accreditation are listed in D Pkg A/DR-14 (Part 2) 'Accredited Package Design and Military Packaging Contractors'.)

Handling

9. Adequate means of handling the PGMU spares and equipment will be required. Wherever possible, they should be capable of being handled by existing Defence Mechanical Handling Equipment (MHE).

Storage

10. PGMU elements will need to be packaged in a manner which enables them to be stored in a manner which ensures that they are serviceable when required.

11. In addition, maintenance tasks may need to be carried out whilst PGMU materiel is in storage/Out of Use and so this will need to be considered whilst identifying suitable packaging and storage arrangements.

12. It is assumed that there will be a requirement for storage and maintenance of equipment at Naval Bases.

13. Key Account Manager (KAM). In due course, once the storage requirement of PGMU equipment is better understood, the Joint Support Chain Services (JSCS) Key Account Manager for Maritime business will be contacted to advise them of the emerging requirement and to ascertain their ability to provide it. Contacts details at Bicester are Key Account Manager SO1- Maritime (94240 5623) and KAM SO2 – Maritime (94240 5635).

Transportation

References:

A. JSP 800 (Defence Movements and Transport Regulations), Vol 6 – Policy for the Management and use of ISO containers within the MoD.
B. JSP 800 4a – Dangerous Goods By Air
C. JSP 800 4b – Dangerous Goods By Road Rail and Sea
D. JSP 800 Vol 7 – Joint Service Movement Data and Equipment Index
E. JSP 800a - (Dangerous Goods (DG)).

14. All PGMU spares and support equipment (other than that permanently integral to any ship) will need to be transportable by air, road, rail or sea.

Air Transportability – [redacted]

15. For air transportability analysis and assessment, the Joint Air Delivery Test and Evaluation Unit (JADTEU) Airportability Information and Design Guide - Guidelines For Internal Air Transportability Of Vehicles And Equipment In RAF Air Transport Aircraft Issue 6 dated Aug 2011 shall be used during the supportability analysis programme.

16. An Air Transportability assessment of PGMU spares (and support equipment) will eventually need to be requested with JADTEU using the necessary form.

ANNEX M TO
PGMU ILSP

17 SOFTWARE SUPPORT PLAN – ANNEX M

Reference:

A. JSP 886 – Vol 7 Part 4 (Software Support)

Introduction

1. This Software Support Plan describes the approach to the analysis, methodology, management and documentation of Software Support for PGMU and in particular those activities which will take place during the PGMU D&M Phase.

2. This Software Support Plan defines policies, procedures and organisational responsibilities for accomplishing the required Software Support tasks for PGMU.

3. As the Software Support programme evolves, the PGMU LIR will be updated and maintained to record the identified Software Support resources.

Aim

4. This plan is the primary tool to be used to establish and execute an effective Software Support programme. It will identify the relationships and responsibilities of the organisations that will support the fielded PGMU software. SA will be used in the definition of support requirements and the injection of support criteria into the acquisition process. The aim is to achieve an optimum balance between system readiness, operational capability and durability, reliability, maintainability, survivability, safety, whole life costs and logistic support requirements.

5. The objectives of the PGMU Software Support programme are to detail:

a. The requirements for software installations on PGMU.

b. The software activities to be performed.

c. Identification of support requirements and related support resources.

d. The support required at each maintenance level by users and maintainers.

e. The specific software functions to be addressed at each level of support.

f. The quality control and configuration management required throughout the in-service life of the software.

g. The change management process used throughout the in-service life of the software.

Approach

6. Obsolescence Management and configuration control are vital elements of Software Support. Changes to the specification and design of PGMU are inevitable over its lifecycle. Since changes may be derived from many sources and will occur throughout the development and support of PGMU, it is vital that an effective change management process is used.

7. The Configuration Management (CM) process, as detailed in the Configuration Management Plan (CMP), has a key part to play in this by ensuring that the status, impact, progress and results of change are tracked. In order to effectively manage this, the change management process to be employed will be closely linked to the CM process.

8. The philosophy of software support involves providing a product that will perform as specifications dictate, provide defect resolution when and if deficiencies are discovered, provide

upgrades and enhancements as the missions evolve and expand, and provide initial training to the operators.

9. Software support will be a vital element in the through-life support of the PGMU active components. To maintain the PGMU Capability, it will be necessary for the system to overcome the challenges of the changing environment and threats that will evolve during its proposed lifetime. To overcome these challenges it will be necessary to update or change the PGMU software as these situations arise.

Supportability Analysis

10. SA will be performed during the D&M phase in accordance with Def Stan 00-600, to identify all resources required to maintain the effectiveness of the application software, provide corrective activities resulting from changes in user requirements, and to provide corrective activities to the application software to ensure compliance with specifications.

SA Strategy

11. The SA strategy detailed in this plan is intended to examine and evaluate the software supportability factors which may be relevant to the PGMU Project. These may include:

a. Modification and Change Control

b. Safety of Personnel and Equipment

c. Expansion (with initial system and consideration of hardware upgrades)

d. Number of systems with applications installed

e. Software Design Structure (Modular Composition)

f. Size and complexity of Run-Time application

g. Security of Executable Code and Security of Data processed by application software

h. Skill Levels of Users

i. Standard Processes Utilisation

j. Technology Evolution

k. Development Tools and Process Maturity

l. Documentation

m. Utilisation and role of the Platform Support Managers

SA Mission and Support Systems Definition

12. The definition analysis determines prime equipment technical requirements, identifies development standards and resolves support system requirements. Prime equipment requirements address the functional and non-functional aspects of the software such as:

a. Built-in-test (BIT)

b. Recovery, Reconfiguration, Degradation

c. Data recording, access, upload, download

d. Growth capacity, memory, processing , data communications

Software Support Standardisation

13. Software Support Standardisation addresses:

a. Development scope

b. Development environment and languages

c. Software system characteristics

d. Development practices and standards considered for PGMU

e. Development staff experience/levels and company experience history

f. Development size and schedule

Software Support System Requirements

14. Software Support System Requirements examine the use of the application software to identify:

a. Readiness/Responsiveness

b. Release frequencies

c. Intellectual Property Rights

d. Use of customer resources

e. International Trade Regulations and Restrictions

f. Proprietary aspects of Non-Developmental Item software

Software Support Functional Requirements and Alternatives

15. Software Support Functional requirements to be addressed includes process modelling relating to:

a. Installation of software and system software configurations

a. Association of system functions to software control or influence

b. Safety integrity or criticality of application software

c. Starting, re-booting, resetting after stoppages

d. System diagnostics, BIT, software driven equipment self checks, software driven end-to-end checks.

e. Modifications to software coding including requirements analysis, self diagnostics, implementation of changes, verification and validation of performance after change implementation, documentation, transfer, and replication.

Determination of Logistics Resources

16. For those Software Support tasks identified in the preceding D&M phase analyses, a detailed step-by-step procedure will be documented in the LIR with all requisite resources necessary for the task including:

a. Manpower and skill levels with training requirements

b. Tools

c. Parts

d. Documentation including any provisioning requirements

e. Elapsed time

f. Maintenance levels

g. Output results of the task

h. Software design change authority

i. New and/or critical resources such as centralised management of the software, maintenance tools at levels above first line, and engineering skills for software modification

Supportability Assessment

17. An assessment strategy should be developed in the D&M phase to measure or observe that all operation and support objectives are met or exceeded. Support objectives must be well defined by co-operative action of the contractor and the MILSM prior to finalising any strategy. Measurements may include:

a. Adequate resource provision for operation and support tasks

b. Time limits or allowances for tasks

c. Frequencies of occurrences

d. Part of the assessment includes identification and listing of all Support Package Components to be evaluated and includes:

e. Software development platform

f. Test equipment, tools, data

g. Facilities

h. Documentation and source code

i. Licenses, Rights agreements, International Trafficking Arms Regulation (ITAR) Regulations, Export agreements

j. Quality Control and Configuration Management processes and procedures

k. Consumables and parts

l. Training and Skills

m. Personnel Requirements

n. Successful assessment is achieved when all operation and support tasks evaluated are accomplished within the constraints of the objectives established in the strategy planning.

Operational Support

18. Software queries or support initiators are events that demand resolution of system mission performance degradation or failure. These initiators are classed as:

a. System software failure modes

b. Changes in the interfaces between processing equipment and operators

c. Changes in the Mission Environment or requirements

d. Changes to the host system hardware/software

e. Changes to interoperation system elements

Problem Reporting

19. A set of procedures shall be developed during the D&M phase to provide a channel for problem/fault reporting to the appropriate level and with the requisite priority to achieve the mission availability specified for the PGMU system. Continuous monitoring of this process through SA and WLC will identify cost drivers and system effectiveness trends that may require correction.

System/Software Configuration Control

20. Configuration control in accordance with the CMP will address the software versions installed within the PGMU system and the status of upgrades in progress. Variants of the software must be tracked to ensure that compatibility is maintained across all installations. LIR and Technical Documentation should reflect how the application is supported.

Delivery/Installation and Verification

21. After a new software release, the product is conveyed to the user in a form suitable to the supply chain management in media, packaging, transportation, security and distribution.

User Support

22. User support is intended to provide an interface to control, direct and resolve issues with the PGMU application software. To this end, the contractor should establish a single communications channel for the receipt of problem reports, queries, help requests or improvement suggestions as part of the software support programme.

Problem Investigation and Change Analysis

23. A method of problem identification that clearly defines the areas of occurrence is essential to the resolution of the issue of application software shortfalls or errors. The descriptive text should include:

a. Specific procedure used

b. Specific action selected

c. Expected result

d. Realised result (system degradation, system lockup, etc.)

e. Error message displayed

f. Specific arguments or input data

g. Sequence of screens and/or commands that led to error

h. Any other information that the user feels in relevant to the problem (i.e. Can the system continue in a reduced mode? Are other areas affected?)

24. Change analysis examines the application software after the problem has been identified as genuine, rather than operator misunderstanding, to determine the most effective way to change the coding to preclude the error permanently. Facilities and resources will be applied to the level necessary to duplicate the problem from simple debuggers that examine code to full scale integration ‘hot benches’ in which the condition may be reproduced. In the case of new requirements, the same resources are applicable.

Change Implementation

25. After analysis has defined and verified the specific need for a software change, implementation will proceed through a typical development cycle of design, coding and testing and integration. Identical or comparable tools, as used in producing the initial product, will be used to implement the changes with additional factors being considered as:

a. Complete history of the primary design

b. Structure, sizing, and performance characteristics of the initial software product

c. Structure, sizing, and performance characteristics of the target processing host

d. Parent equipment/system of target processor

e. Interoperability with other systems or software

f. Age or obsolescence of development tools and processes

g. The end objective of the software change control is to create a replica environment for the software with the requisite inputs and stimuli.

Change Release

26. Implementation is complete with production of a successfully tested and certified executable file or files. This executable source is combined with installation documentation, user documentation, edited or re-released version description documents and delivered to the appropriate point for induction into the system.

Configuration Control

27. Configuration control procedures will be in place to monitor and track all changes (complete or in progress).

Training

28. The training required for the Software Support of the PGMU Capability will be driven by the Phase 2 Training Needs Analysis (TNA) to be conducted during the D&M phase in accordance with the PGMU Training Plan.

ANNEX N TO
PGMU ILSP

18 DISPOSAL PLAN – ANNEX N

1. The Disposal Services Authority (DSA) are the lead for the disposal of all MoD assets. SSE GP2.7 and JSP 886 provide MoD guidance and policy for Disposal Planning. Disposal Planning will address the requirements for ensuring that all parts of the PGMU Project can be economically disposed of at the end of system life. Where a particular design feature requires a special disposal method the Contractor must justify this. The Project Team (PT) must ensure that details of all hazardous material used in the production of the system should be documented and that this document is maintained through the equipments service life.
2. The contractor shall produce an Initial Disposal Plan that will describe how the system can be disposed of during the In-Service and Disposal Phases of the system's life. It will address the requirements for ensuring that all parts of the system can be economically and safely disposed of at the end of the system life. Where a particular design feature requires a special disposal method the Contractor shall justify this. The Disposal Planning Task shall focus on, but not be limited to, the following:

    (1) Identification of all items requiring special disposal.

    (2) Estimates of activities to carry out disposal.

    (3) Current legislation applicability, FMS, ITAR etc.

    (4) Safety aspects regarding disposal.

    (5) Control of Substances Hazardous to Health (COSHH).

3. The strategy for disposal will need to consider, in order of preference:
    a. Re-Deployment

    b. Sale (Marketing teams from Industry, working with the MoD's Defence Export Services Organisation (DESO), Disposal Services Agency (DSA) and the IPT can offer innovative solutions to meet the needs of other Countries for ‘value for money’ effective weapon systems. Much of the on-selling will be dependent on the market needs and therefore on understanding the market place)

    c. Return To Industry

    d. Recovery and sale of Material and Disposal Of Waste (including environmental impact)

    e. Disposal At Cost To The MOD
4. Disposal risk areas which will need to be identified and mitigated are as follows:
    a. Hazardous material
    b. Environmental implications

c. Data archiving/transfer
d. Safety implications
e. Security
f. Changes to legislation (both National & International)
g. Estimated disposal costs and receipts
h. The appropriate accounting treatment

5. For classified or hazardous items that require disposal at cost, the PT are not compelled to use the DSA for the disposal of the equipment, but a value for money (vfm) comparison for the proposed method of disposal will be sought for comparison purposes..

6. For any novel or innovative disposal proposals, such as disposal by the Service Provider, authorisation should be sought by the submission of a Business Case to Fin Pol, copied in to the DSA.

ANNEX O TO
PGMU ILSP

19 LOGISTIC SUPPORT DATE (LSD) CRITERIA – ANNEX O

Logistic Support Date (LSD).

1. The LSD is the date when all support elements are in place to support the new PGMU system. The PGMU LSC will define the LSD criteria for the project during the D&M phase and ensure that all ILS elements are satisfactorily completed, following successful verification and validation of the PGMU Log Demo, and implemented before LSD is declared by the PGMU PM (having been briefed by the PGMU ILSM).

2. Achieving the LSD is an anchor milestone and is effectively the 'sign-off' of the Logistics DLOD. This sign-off will be included in the overall DLOD integration work.

3. The LSD for PGMU is as follows:

PGMU Vessel	LSD	ISD/PASE
First of Class	SAT(ME) minus 3 months	Fleet Date of First of Class

Table O1 – Planned LSD

4. The LSD Criteria will be set by the LSC during the Demonstration Phase. The criteria will be linked to the activities in the ITEAP to ensure that all elements of the support system have been shown to be effective.

5. LSD areas include:

   a. Training (for maintainers);

   b. Facilities;

   c. Technical Documentation (including SPS, BR, MEGs etc);

   d. S&TE;

   e. PHS&T;

   f. Maintenance Policy;

   g. Provisioning and Supply Chain;

   h. CLS elements.

6. Each LSC sub-working group will report to the LSC giving an update on progress towards meeting the LSD criteria.

7. The MOD ILSM will be responsible for advising the PGMU IPTL on the progress towards LSD after each LSC meeting.

ANNEX P TO
PGMU ILSP

20 TERMS OF REFERENCE - PGMU LOGISTIC SUPPORT COMMITTEE (LSC) – ANNEX P

Introduction

1. The PGMU LSC (which in effect is the Logistics DLOD WG) will provide specialist advice and support to the MOD ILSM on all aspects of equipment support throughout the life of PGMU.

2. The LSC will engage and consult SSE GP owners to ensure that any decisions made on the emerging support solution fits within the SSE guiding principles.

Aim

3. The aim of the LSC is to develop and implement an effective and coherent support solution for PGMU.

Terms of Reference

4. The Terms of Reference (TOR) for the LSC are listed below. The PGMU LSC will:

   a. Develop and maintain this Integrated Logistic Support Plan, Use Study and SOW for PGMU at all relevant phases of the programme;

   b. Identify overall logistic support implications of introducing PGMU into service, including the impact on existing systems;

   c. Provide input to and verify output from SA tasks as applied to all aspects of the new system;

   d. Provide logistic input to and assist with the development of all supportability areas for the Contract;

   e. Define LSD readiness criteria and monitor the provision of all necessary Logistic Support elements.

   f. Provide Logistics input to DLOD SWGs as follows:

      1) Training
      2) Equipment
      3) Personnel
      4) Infrastructure
      5) Doctrine & Concepts
      6) Organisation
      7) Information

Initial Meeting and Frequency

5. The first PGMU LSC meeting was held in March 2013.

6. PGMU LSC meetings will normally be held every 3 months or as directed by the PGMU ILSM.

Activities

7. The support planning activities of the LSC members will be focused in the following areas:

    a. Development and management of the ILS Element Plans;

    b. Liaison with, and assistance to, the contractor on support planning issues;

    c. Review of the Contractor's progress against his ISP and SAP;

    d. Review of the contractor’s ILS deliverables

    e. Evaluation of the system design for supportability.

Chairmanship

8. The chairman of the PGMU LSC is to be the PGMU ILSM.

Membership of the LSC

9. The following SSE GP SMEs have been identified as being candidates for membership of the PGMU LSC and will be called upon to attend, if available, LSC meetings as required.

10. The PGMU LSC membership is as follows:

Ser	ILS Element	Branch/Unit	POC	Tel	Responsibilities
(a)		(b)	(d)	(e)	(f)
1	LSC Chairman	PGMU PM			Chairmanship of the LSC. Responsible for all PGMU support related issues.
	LSC Sec	PGMU ILSM			Responsible to the above for all support related issues including JSC Assurance.
2	TLS Support Solution Officer (SSO)	DES JSC SCM SSIT			Provision of ILS advice and guidance. Assessment of support solution (aided by SSE Development Tool entries). Produces SSR.
3	ESG Reps				
4	Reliability & Maintainability (R&M)	TLS – Reliability & Maintainability Group (RMG)			Provision of R&M advice and guidance
5	Technical Documentation	TLS - Technical Information			Provides advice and guidance on TD policy. Assesses TD Plan as part of the ILSP.
6	Training and Training Equipment	Training PGMU			2SL LO
7	WLC	Cost Manager			Producing WLC model and TLF CR template. Assessing contractor's WLC data. Capturing cost data.
8	Obsolescence	TLS – Obsolescence			Providing Obsolescence

Ser	ILS Element	Branch/Unit	POC	Tel	Responsibilities
(a)		(b)	(d)	(e)	(f)
		Management			advice. Assessing contractor's Obsolescence Management Plan.
9	Software Support	SEIG – Software Supportability Team			Technical advice on software supportability and maintainability.
10	Customer Rep	HQ FLEET			Act as the user focus for support issues
11	Logistics Rep	HQ FLEET – Logistics Future Capability			Assisting in the development of future support solutions

Table P5 - Membership of the PGMU LSC

GLOSSARY OF TERMS AND ABBREVIATIONS

A&A	Alteration and Addition
AR&M	Availability, Reliability and Maintainability
ASW	Anti-Submarine Warfare
BRM	Business Relationship Management
CADMID	Concept, Assessment, Development, Manufacture, In-service, Disposal
DRL	Contract Data Requirements List
CES	Continuous Engineering Support
CfA	Contracting for Availability
CLS	Contractor Logistic Support
CM	Configuration Management
CODLAG	Combined Diesel Electric and Gas Turbine
COM	Class Output Management
CONDO	Contractors on Deployed Operations
COO	Cost Of Ownership
COTS	Commercial off The Shelf
CSO(E)	Chief Staff Officer (Engineering)
DE&S	Defence Equipment and Support
Def Stan	Defence Standard
DEFCON	Defence Contract Condition
DID	Data Item Descriptions
DRACAS	Defect Reporting and Corrective Action System
DSS	Data Selection Sheet
E2E	End to End
EDC	Electrical Distribution Centre
EM	Electric Motor
EoL	End of Life
FE	Force Elements
FE@R	Force Elements @ Readiness
FMECA	Failure Mode Effects and Criticality Analysis
FWE	Fleet Wide Equipment
GFA	Government Furnished Assets
GP	Governing Policy (for SSE)
GT	Gas Turbine
ILS	Integrated Logistic Support
ILSP	Integrated Logistic Support Plan
ISP	Integrated Support Plan
IT	Information Technology
ITEAP	Integrated Teat, Evaluation, and Acceptance Plan
ITT	Invitation to Tender
JSP	Joint Service Publication
KPI	Key Performance Indicator
LCC	Life Cycle Costs
LCP	Local Control Panel
LOA	Logistics Operational Assurance
Log Demo/ LD	Logistic Demonstration
LORA	Level of Repair Analysis
LSA	Logistic Support Analysis
LSC	Logistic Support Committee

LSD	Logistic Support Date
MCAS	Machinery Control and Surveillance System
ME	Marine Engineering
MES	Marine Equipment Support
MET	Marine Equipment Transformation
MOTS	Military Off The Shelf
NAG	Northern Arabian Gulf
OEM	Original Equipment Manufacturer
OM	Obsolescence Management
OMP	Obsolescence Management Plan
OPDEF	Operational Defect
OSD	Out of Service date
PDS	Post Design Support
PGMU	T23 Power Generation and Machinery Control and Surveillance Update
PGSU	Power Generation System Update
PI	Performance Indicator
PT	Project Team
QMS	Quality Management System
RCM	Reliability Centred Maintenance
RN	Royal Navy
SA	Supportability Analysis
SAP	Supportability Analysis Plan
SCC	Ship Control Centre
SM	Support Manager
SME	Subject Matter Expert
SMM	Ship Maintenance Management
SOM	Support Options Matrix
SOW	Statement of Work
SRD	System Requirements Document
SSE	Support Solutions Envelope
SSO	Support Solutions Officer
SSSA	Surface Ship Support Alliance
T23	Type 23 Frigate
TLB	Top Level Budget
TLF	Through Life Finance
TLMP	Through Life Management Plan
TNA	Training Needs Analysis
UMMS	Unit Maintenance Management System
URD	User Requirements Document
VFM	Value for Money
WBS	Work Breakdown Structure
WLC	Whole Life Cost