PART CH93

ASSET MANAGEMENT

CONTENTS

1. GENERAL

.1 This part specifies the requirements for the development of an Integrated Support and Asset Management Plan to facilitate the delivery of the Asset Management Technical Data.

.2 These documents is must be provided to allow efficient and effective monitoring and maintenance, operation, modification, decommissioning and disposal of the Works and related assets.

.3 The following documents are referenced in this Part:

AS 1100	Technical Drawing
AS 9001	Quality Management Systems - Requirements
AS 4292.1	Rail Safety Management Part 1: General Requirements;
AS 4292.2	Rail Safety Management Part 2: Track, Civil and Electrical Infrastructure;
AS 4292.4	Rail Safety Management Part 4: Signalling and Telecommunications Systems and Equipment
AS 14001	Environmental management systems - Requirements with guidance for use
PAS 55:	British Standards Institution's (BSI) Publicly Available Specification for the optimized management of physical assets

DPTI Documents:

FR-SR-GE-002	PTSOM Integrated Safety Management System
PTS AM4-DOC-000364	Drafting Standard for AutoCAD Drawings ("PTS 364")
PTS-MS-05-DC-PRC-00000090	Identification and Numbering of Technical Documents and Drawings ("PTS 90")
PTS-MS-05-AM-PRC-00000091	Asset Management Technical Data Requirements for Projects ("PTS 91")

.4 The following definitions apply:

"AMTD" means Asset Management Technical Data

"ISP" means Integrated Support Plan

"Maximo" means the Principal's software for the management of railway assets.

2. ASSET MANAGEMENT STRATEGY

.1 To support flexibility in the development of this strategy Principal's Asset Management Strategy, the Principal intends, through the delivery of this Contract to:

(a) own sufficient AMTD to either perform operation and maintenance using its own resources, through a contract for operation and maintenance services, or a combination of both; and

(b) in the event that operation and maintenance is contracted to a service provider, to provide the asset management system application (Maximo), required special tools, test equipment and potentially spare parts and the AMTD to the service provider as customer furnished data and equipment. Other than the Maximo application, these deliverables must be provided through this Contract.

3. AMTD DEVELOPMENT AND DELIVERY OVERVIEW

.1 The AMTD is the output of the integrated support planning that the Contractor must perform. The integrated support planning and analysis is conducted in conjunction with the design program for the Works.

.2 The Contractor must plan, manage and execute the integrated support planning, AMTD development and delivery in parallel with the design of the Works.

.3 The Contractor must provide draft revisions of lists, plans and other deliverables at the relevant design lifecycle Design Stage Reviews. These deliverables must progressively mature as the design program is completed and the Works are executed. The final state must be reflected in the delivered AMTD.

.4 In summary, the main deliverables required through the design lifecycle are:

(a) Preliminary asset List

(b) Preliminary Decommissioned asset list

(c) Final asset List

(d) Parts List(including spare parts)

(e) Drawing List

(f) Technical Document List

(g) Third Party Asset List

(h) Defect List

(i) Waiver list

(j) Software List

(k) Special Tools & Equipment List

(l) Technical Record List

(m) Final Decommissioned List

4. CONTRACTOR'S INTEGRATED SUPPORT AND ASSET MANAGEMENT PLAN

.1 The Contractor must develop an ISP that describes the management systems, scope, subordinate plans and processes and schedules that the Contractor will use to integrate operational and maintenance requirements with its design program, leading to the development of the AMTD. The AMTD plan must comply with the requirements of:

(a) this Contract;

(b) AS 9001;

(c) AS 4292.1;

(d) AS 4292.2;

(e) AS 4292.4; and

(f) AS 14001 (for Environmental Management Plans).

.2 The ISP must include:

(a) Definition of integrated support roles and responsibilities;

(b) Explanation of the management structures planned, including any subcontractors;

(c) Description of the approach to developing each element of the Works including the methods and tools to be used for analysis;

(d) Explanation of the analysis techniques to be used (such as Level of Repair Analysis, Failure Modes, Effects and Criticality Analysis, Logistic Support Analysis);

(e) Application of the Contractor's Safety Management Plan to the integrated support planning;

(f) Integration with other aspects of the Contractor's Project Management Plan and the Engineering and Design Management Plan, especially the design stage reviews;

(g) Intended use of analysis, analysis tools or experience from previous projects or in service equipment;

(h) Input required from the Principal to inform the Contractor's work;

(i) Proposed Hold Points;

(j) Relationship with subordinate integrated support plans;

(k) Intended method for reporting and advice to the Principal as the integrated support analysis proceeds;

(l) Description of the integrated support program deliverable outputs;

(m) Proposed verification and validation strategy;

(n) Quality management and audit management;

(o) maintenance strategy (the principles that guide and structure the maintenance activities consistent with the delivery and achievement of the RAMS requirements);

(p) maintenance documentation to enable both planned and unplanned maintenance to ensure that the System meets performance requirements;

(q) integration of the System into the PTSOM Maximo Asset Management System;

(r) maintenance tools;

(s) maintenance staff requirements;

(t) spares strategy; and

(u) ongoing System support after Operable Stage Completion, Section Completion and System Completion.

(v) Alignment with ISO 55000, ISO 55001 and ISO 55002 (formerly PAS 55).

.3 The ISP must address the following as a minimum:

Introduction

Details the Contractors approach to asset management

Organisation Chart for Asset Management

Identifies how the contractor will ensure that asset management is embedded in the management structure.

Asset Management Personnel

Contractor's personnel accountable for implementing the ISP – evidence of competency assessment must be included to demonstrate that the personnel have the relevant experience and skills in asset management processes and delivery.

Asset Management Roles And Responsibilities

The roles and responsibilities of the contractor's personnel assigned to asset management including liaison with DPTI and PTS

Program for Asset Management Delivery

A detailed chart of timing and deliverables throughout the full lifecycle of the project – this may be included in the overall project plan.

Compliance with PTS - 05-AM-PRC-00000091 "Asset Management Technical Data Requirements for Projects'

The Contactor must provide details of how compliance with the above document will be achieved for the following:

- Preliminary Asset List
- Preliminary Decommissioned Asset List
- Final Asset List
- Parts List
- Drawings
- Technical documents
- List of Third Party assets
- List of defects
- List of waivers
- Software list
- Special Tools and Equipment List
- Technical records
- Final Decommissioned Asset List

Handover Management

Describes how the contractor will manage the asset management deliverables through the handover phase

Finalisation

How the contractor will manage the asset management requirements related to defects etc post project completion

.4 The output from the integrated support planning must be the set of Asset Management Technical Data.

.5 The ISP must be submitted at the completion of the following Design Stages:

(a) Requirements Definition (notionally 15% complete)

(b) Preliminary Design (notionally 30% complete)

(c) Detailed Design (notionally 70% complete);

(d) Final Design; and (notionally 100% complete)

(e) Engineering Completion (at the completion of the construction of the Works but prior to commissioning of the Works).

.6 The provision of the ISP shall constitute a **HOLD POINT**.

5. ASSET MANAGEMENT

Format And Standard Of Asset Management Technical Data

.1 In general, unless another standard is specified and endorsed by the Principal's Authorised Person, the format and standard of AMTD must conform to Australian Standards or international equivalents, DPTI Standards and Procedures, including:

(a) AS 1100 for technical drawings;

(b) PTS 364 for AutoCAD Drawings;

(c) PTS90 for the identification and numbering of technical documents and drawings; and

(d) PTS 91.

.2 The Contractor propose other standards, which will be subject to the Principal's Authorised Person's prior approval..

.3 In general, unless another electronic format is specified and endorsed by the Principal's Authorised Person, the AMTD must be in Microsoft Office 97-2003 format. File name format must be in a format agreed with the Principal's Authorised Person.

.4 In the case of specialist analysis or design applications, an output report must be provided in MS Office readable format and a copy of the operating model provided in the native format from the application.

Traceability

.5 During the design, procurement, manufacturing, installation, testing and maintenance phases of the Project, it is imperative that all documentation and equipment are adequately tracked.

.6 The levels to which traceability will be applied will be based on the smallest component replaceable under normal usage during the maintenance and operating phases and will be identified by individual item, batch or manufacturer as appropriate. These levels, together with the format of the data itself, must be defined by the Contractor and agreed by the Principal's Authorised Person except where they are already defined by the Contract.

.7 In the case of specialist analysis or design applications, an output report must be provided in Microsoft Office™ readable format and a copy of the operating model provided in the native format from the pplication.

.8 The Contractor must submit the AMTD prior to System Operable Completion for each Stage to enable the Principal's Authorised Person to operate and maintain the System.

Labelling and Identification Marking

.9 The Contractor must provide and affix suitable labelling for both the assets and for the locations.

.10 Labels must be clearly legible, durable, of a size commensurate with their use, consist of materials which present no harmful effects to the asset to which they are attached or to any other in the immediate vicinity

and securely attached. Depending on the individual item, labels may be stamped, engraved, etched or painted.

.11 Assets must have two labels, one label indicating the operational number of the asset, (such as a signal number) and another label displaying the actual asset number along with a bar-code representation of the asset number.

.12 The method of labeling and its nomenclature must be agreed between the Contractor and the Principal's Authorised Person prior to manufacturing, except where it is already defined by the Contract.

.13 Where a number of interchangeable items could be located at one of several locations, the labelling procedure must be such as to facilitate the tracking of a specific asset from its initial installation, through a number of removals, repairs, refurbishments, storage and subsequent relocations.

6. ASSET MANAGEMENT TECHNICAL DATA DELIVERABLES

General

.1 The Contractor must deliver the AMTD required for the Principal to operate and maintain the Works including the following deliverables:

(a) Existing Asset List;

(b) Asset List of Physical Assets;

(c) Technical Data Pack of Works As Executed;

(d) Maintenance Manuals;

(e) Operators Handbooks;

(f) Training Management Package;

(g) Repair Parts Lists (Recommended Spares List, Insurance Items List, Consumable Items List, Hazardous Items List, Recommended Tools and Test Equipment); and

(h) System Engineering & Safety Assurance records

Technical Data Pack – As Built

.2 The Technical Data Pack – As Built must be prepared from the digital model used for the final design approved for construction with details updated to incorporate the works as executed condition. The digital model must be updated in all respects prior to the update of the As Built drawings.

.3 Drawings must enable operations and maintenance personnel to quickly and effectively locate and identify equipment, diagnose faults, trace circuits and allow for design alterations over the life of the assets. The traction power drawings must have a clear hierarchy, show equipment in a clear and concise method of linking circuits across drawings. Fonts used must be clear and readable in A3 size prints. Cable block diagrams and interlock block diagrams are required. It is desirable that critical circuits such as substation interlocking, closing, tripping and protection circuits especially clear to understand and apply.

.4 The Contractor must:

(a) Submit sample As Built Drawings for different system and types for review by the Principal prior to production of actual drawings;

(b) Show on As Built Drawings the Works as completed;

(c) Ensure the content, accuracy and level of detail of As Built Drawings are equivalent to those in the detail design drawings used for construction and are sufficient to describe, and sufficient to enable and ensure the efficient operation of the assets created under this Contract and the Principal's Asset Management System;

(d) Include in As Built Drawings final survey drawings indicating the positioning of the Works relative to the primary survey grid;

(e) Certify each As Built Drawings as to its accuracy, completeness and correctness

(f) Certify survey aspects of the drawings using a registered surveyor;

(g) Where needed to describe the Works, or where directed by the Principal, include digital photographs of specific aspects of the Works in As Built Drawings; and

(h) Identify and cross reference assets on As Built Drawings with the information in the Asset List.

Maintenance Manuals

.5 The Maintenance Manuals must provide comprehensive instructions for the performance of preventive and corrective maintenance of the assets as an operating system.

.6 The Maintenance Manuals must be computer based with the capability to print relevant and concise uncontrolled hard copies for transient use only. Maintenance and inspection requirements should be aligned to best practice rail engineering for each asset. If necessary, the Contractor must reconcile differences between suppliers' maintenance requirements where these differ for similar equipment.

.7 The Contractor must apply a "value for money" assessment on the maintenance practices to optimise the whole of life costs of the assets.

.8 The Contractor must prepare the Maintenance Manuals as follows or propose an alternative for consideration by the Principal:

(a) A logical contents structure that facilitates location of, or navigation to, the appropriate section, task or asset or component;

(b) A location plan with introductory text to identify and locate all the elements of the assets covered by the Manual;

(c) Descriptions of the operating principles of the asset systems and subsystems with basic working descriptions;

(d) Detailed description of each of the elements of the assets covered by the Manual (all equipment, components, systems and items);

(e) Tabulation of dimensions and performance ratings;

(f) Diagrams of the various utilities and services such as communication services;

(g) Safety and hazardous materials warnings;

(h) Fault finding guides and diagnostic logical flows;

(i) Instructions for use of built in test, fault codes or other embedded maintenance assistance tools;

(j) Maintenance schedules for inspection and servicing (eg daily, weekly, monthly, annually and similar);

(k) Illustrated assembly and parts catalogues or embedded links;

(l) Maintenance task descriptions, step by step, including necessary resources such as trade qualifications, tools, repair parts, consumables including quantities, estimated task duration for all maintenance tasks including inspection, adjustment, preventive maintenance, corrective maintenance and rebuilds expanded to the level of the lowest repairable unit;

(m) For software orientated systems, functional specifications (hardware and software), systems programs, interface specifications, installation instructions, test specifications, test results, individual program modules, including flow charts and source codes and similar;

(n) Procedures for equipment energisation or other startup, operations and shutdown;

(o) Procedures for emergency shutdown and abnormal operations;

(p) Information on alarm and trip settings;

(q) Parameters for operation such as temperature, humidity, wind speed or other limits;

(r) Any special requirements for the packaging, handling, storage or transportation of any of the assets; and

(s) Any other information needed by maintenance staff to ensure the safe and efficient maintenance and operation of the equipment.

.9 The parts and assemblies used in the repair and maintenance must be integrated into the asset management system where store stock items are held for critical and commonly used items and supply agreements are maintained for other items. The store stocking philosophy must be documented in the AMP and AMTD plans.

.10 The manuals must be a comprehensive set of documents, based on the design, installation, test, commissioning and training information, detailing all such technical data required to enable the Principal's Authorised Person to effectively operate and maintain the System.

.11 At the Preliminary Design Stage the Contractor must propose for the Principal's Authorised Person's review a format that allows the integration of the detailed maintenance tasks into the PTSOM Maximo Asset Management System.

.12 This submission shall constitute a **HOLD POINT**.

.13 Where safety requirements are to be implemented through operational or maintenance instructions or important safety related application constraints are to be applied by operators or maintainers then the Contractor must clearly identify these within the manuals.

.14 The Contractor must provide the following manuals and asset information:

(a) Test Equipment Manuals - instructions for the use of each type of Test Equipment provided under the system to which the manual refers;

(b) Troubleshooting Guides - a comprehensive fault finding guide and rectification information and processes;

(c) Operating Manuals – manuals for both Train Operators and OCC Operation Controllers for equipment relating to the System; and

(d) Maintenance Manuals - for all System equipment, including equipment located at the OCC, trackside and equipment to be fitted to trains.

.15 The manuals must:

(a) be designed for continuous long-term use in a field or maintenance workshop environment;

(b) lie flat when opened;

(c) have A4 standard pages and A3 drawings;

(d) be supplied and must be original printed documents;

(e) be presented in language free of vague and ambiguous terms;

(f) have thorough, clear and complete content;

(g) have short and concise sentences;

(h) use punctuation that aids reading;

(i) be designed for use by technicians with varied skill levels;

(j) only use technical words when no other words can convey the intended meaning; and

(k) describe the maintenance tasks in a form acceptable to the Principal's Authorised Person and be ready to use without any further development by Principal's Authorised Person.

.16 The Contractor must consult with the Principal's Authorised Person on the format, hierarchy and delivery of manuals and comply with the Principal's Authorised Person's requirements.

.17 All manuals must be submitted to the Principal's Authorised Person for review, each submission shall constitute a **HOLD POINT**.

.18 The Contractor must provide the numbers of manuals as follows:

Manual Type	**Number to be delivered**
Test Equipment Manuals	10 sets for each type of test equipment
Troubleshooting Guides	One per SER plus 30 sets
Operating Manuals	25 sets
Maintenance Manuals	25 sets

.19 The Contractor must supply the final version of all manuals in an open source electronic format approved by the Principal's Authorised Person that allows the source material to be modified including extracts for integration into the PTSOM Maximo Asset Management System.

.20 The Contractor must deliver all final versions of all manuals to the locations as directed by the Principal's Authorised Person.

Operator's Handbooks

.21 The Operator's Handbooks must provide comprehensive instructions for the operation of the Works as an operating system that underpins the Adelaide Rail System. The Operator's Handbooks are expected to be computer based with the capability to print relevant and concise uncontrolled hard copies for transient use

only. The Contractor must prepare the Operator's Handbooks as follows or propose an alternative to be considered by the Principal:

(a) A introductory section that describes the basic outline, purpose, layout and other general characteristics of the Works and the major assets within;

(b) A section providing comprehensive information about safety and hazardous materials or situations that may or do exist in the Works;

(c) A section describing the operating principles of the Works and the states under which it may operate;

(d) A section describing the limitations to the operation of the Works such as temperatures, wind, power, voltage;

(e) Comprehensive step by step descriptions to enable operators to achieve any of the states under which the system is authorised to operate, including but not limited to shut down, emergency shutdown, normal operations, redundant or fault condition or partial system operations, planned alternative operations, and emergency operations;

(f) Operation of any control systems, hardware and software, including instructions for recovery from software failures;

(g) Descriptions of any operator maintenance (inspection, daily servicing, adjustment, tuning) tasks; and

(h) Any other information needed by operators to ensure the safe and efficient operation of the Works.

.22 The Contractor must deliver the Operator's Handbooks in an open source electronic format that allows the Principal to modify the source material including extracts for integration into the Principal's asset management system Maximo.

Training Management Package

.23 As Detailed in Part 308 "Training," training support materials that allows DPTI to train its Operators and Maintainers in the operation, inspection and maintenance of the equipment supplied and installed by the Contractor.

Repair Parts Lists

.24 The Contractor must provide for the Principal's Authorised Person's review the recommended spare part holding as a part of the ISP.

.25 The spare part holding must be sufficient for the Contractor to meet the System RAMS requirements.. The Contractor must recommend a spares distribution around the AMPRN that reflects the System architecture, resupply times and RAMS requirements.

.26 The Repair Parts Lists must record the output of the Contractor's integrated support planning and spares assessment analysis. The lists must be proposed to the Principal for procurement, which may occur at the Principal's sole discretion through the issue of a variation to the Contract. The Repair Parts Lists must include any repair kits that may be relevant to the Works and any special tools and test equipment.

.27 The Repair Parts Lists must define the recommended range and quantity of rotable and repairable items, insurance spares, consumables and tools and test equipment. Each list must provide relevant information about the repair parts in accordance with PTS 90.

Delivery of Initial Spares

.28 Subject to the Principal's Authorised Person's review of the recommended spares, the Contractor must deliver to the Principal's Authorised Person the initial spares for each Operable Stage 12 weeks prior to the completion of that Operable Stage.

Spares Part Numbering

.29 Every component, subassembly, and assembly must be assigned a unique part number. The unique part number must coincide with the markings on the equipment itself (barcode or equivalent) and must be used in documentation whenever the part is referenced. Where standard components are used, standard part numbers or the component supplier's identification number must be shown in addition to the part numbering described above.

Special Tools and Test Equipment

.30 The Contractor must provide for the Principal's Authorised Person's review the recommended special tools and equipment as a part of the ISP.

.31 The Contractor must propose the list of portable and workshop test equipment for the approval of the Principal's Authorised Person no less than six months prior to the completion of each Operable Stage.

.32 Special Tools and Test Equipment must include workshop test and portable test equipment.

Post Commissioning Support

.33 Immediately after commissioning of any aspect of the Works the Contractor must maintain technical support on site for a period of 24 hours to attend to any issues that may arise.

.34 The Contractor must maintain a contact number (manned 24 hours per day 7 days per week) during the contract and through the Defects Liability Period where the Principal's Authorised Person or Principal's Authorised Person's staff can receive technical advice or call out technical support from the Contractor.

.35 When called to attend to a fault at site the Contractor must be available at the site location within 1 hour of the call being placed and must remain in attendance until advised by the Principal's Authorised Person.

.36 When called to attend a fault post commissioning the Contractor must complete a report advising:

(a) details of call-out (Time, Date, Location);

(b) equipment attended (Asset No and description);

(c) action taken;

(d) material replaced; and

(e) other relevant information.

.37 The report must provide enough information to determine the root cause of the issue and must be provided to the Principal's Authorised Person within 24 hours of the call-out.

.38 The Contractor must maintain this information in a FRACAS (Failure Reporting, Analysis and Corrective Action System) such that the data can be made available to support system RAM analysis.

7. INTEGRATED SUPPORT PLANNING AND DESIGN COORDINATION AND REPORTING

Detailed Design Stage

.1 The Contractor must prepare and provide at Detailed Design Stage:

(a) Proposed updates to the Principal's Template for the Asset List of Physical Assets Attribute Data;

(b) Updated volume "book plan" for the Operators Handbook;

(c) Updated volume "book plan" for the Maintenance Manuals;

(d) Updated Training Management Package; and

(e) Samples of each type of engineering drawing that will be delivered in the Technical Data Pack – Works As Executed.

Final Design Stage

.2 The Contractor must prepare and provide at Final Design Stage:

(a) Proposed updates to the Principal's Template for the Asset List of Physical Assets Attribute Data;

(b) Draft Operators Handbook;

(c) Draft Maintenance Manuals;

(d) Draft Training Management Package;

(e) Draft Index for the Technical Data Pack of Works As Executed; and

(f) Draft Repair Parts Lists (Recommended Spares List, Insurance Items List, Consumable Items List, Hazardous Items List, Recommended Tools and Test Equipment).

Engineering Completion Stage

.3 The Contractor must prepare and provide at Engineering Completion Stage an updated Asset List electronically in the curent version of Microsoft Excel:

(a) Final Asset List of Physical Assets Attribute Data;

(b) Final Operators Handbook;

(c) Final Maintenance Manuals;

(d) Final Training Management Package;

(e) Technical Data Pack of Works As Executed; and

(f) Final Repair Parts Lists (Recommended Spares List, Insurance Items List, Consumable Items List, Hazardous Items List, Recommended Tools and Test Equipment).

Engineering Close Down Stage

.4 The Contractor must at Engineering Completion Stage updates arising from defects corrected during the defects liability period to the:

(a) Asset List of Physical Assets Attribute Data;

(b) Operators Handbook;

(c) Maintenance Manuals;

(d) Training Management Package;

(e) Technical Data Pack of Works As Executed; and

(f) Repair Parts Lists (Recommended Spares List, Insurance Items List, Consumable Items List, Hazardous Items List, Recommended Tools and Test Equipment).

8. HOLD POINTS

.1 The following is a summary of Hold Points referenced in this Part:

CLAUSE REF.	HOLD POINT	RESPONSE TIME
4.6	Provision of Integrated Support Plan (ISP)	20 working days
6.12	Integration with Maximo submission	20 working days