

Automated Transportation Management System (ATMS) Configuration Management Plan

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Automated Transportation Management System (ATMS) Configuration Management Plan

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**AUTOMATED TRANSPORTATION MANAGEMENT SYSTEM
SOFTWARE CONFIGURATION MANAGEMENT PLAN**

1.0 INTRODUCTION

1.1 PURPOSE

This document describes the Software Configuration Management (SCM) approach and procedures to be utilized in ensuring and controlling the development process and maintenance of the Automated Transportation Management System (ATMS V1.0 and ATMS V2.0). The sponsor has identified ATMS and its components as unclassified and non-sensitive. The configuration management procedures are necessary to ensure that any changes made to software and related documentation are consistent with ATMS goals and objectives and contained securely in a central library. The objectives of the Plan are to:

- Establish product baselines that support the change process
- Ensure that all system changes support ATMS goals and objectives
- Ensure that the potential impacts of system changes are adequately evaluated prior to implementation
- Ensure that the latest approved versions of all software are being used in all environments (current production, development and future production)
- Establish a configuration status reporting standard that informs pertinent individuals of ATMS system status
- Ensure that the baselines always remain current with the production software and documentation
- Ensure that configuration management is integrated with other management plans designed to meet the overall objectives and goals of ATMS
- Ensure that the configuration library function of maintaining all master copies of documentation and software for each product is supported.

1.2 SCOPE

This plan applies to all software and associated documentation used in the production of the ATMS V1.0 and ATMS V2.0 system. Software configuration items to be controlled by this plan include both procured software and applications software to be developed during the project. No distinction is made between phases of implementation of the project.

The software products to be produced are applications software for the ATMS V1.0 and ATMS V2.0. Host software products, (e.g., a relational database management system) and peripheral host products, (e.g., forms generator software to aid the programmer in building data entry screens and a report generator to aid in building reports) will be provided for systems developers.

This SCM Plan specifically covers the configuration management for:

1. Development of system software, ATMS V2.0
2. Development of system documentation, ATMS V2.0
3. Continued system support following implementation, for ATMS V1.0 and ATMS V2.0.

In addition, this plan discusses the following subjects:

1. Configuration Identification - Description of the hardware, software, required documentation, project responsibilities, and limitations of approvals with respect to specific control, and the review and delivery schedule.
2. Configuration Control - Description of software configuration change procedures, hardware configuration change procedures, software interface control, and organization interfaces.
3. Configuration Accounting - Description of procedures and forms used to record configuration changes.
4. Reviews and Audits - Description of audit and review plans, method for handling deviations, change procedures, and relationships between reviews and the development cycle.

1.3 OVERVIEW

This SCM Plan covers the development and maintenance of all ATMS software and associated documentation for both the PC version (V1.0) and ATMS (V2.0). The software and documentation are being developed by the ATMS Development Team, with guidance from the Technical Project Manager, the Integrated Program Coordinator, the ATMS Users Group, the ATMS Change Control Board (CCB), and the Transportation Automation Program Manager.

1.4 DEFINITIONS AND ACRONYMS

Definitions and acronyms used in this document will follow American National Standards Institute (ANSI)/ Institute of Electrical and Electronics Engineers (IEEE) 610.12-1990, Glossary of Software Engineering Technology (ANSI/IEEE 1990).

1.4.1 Definitions

The following terms are used throughout this document.

Configuration Identification — (1) The process of designating the configuration items in a system and recording their characteristics; (2) The approved documentation that defines a configuration item; and (3) The current approved or conditionally approved technical documentation for a configuration item as set forth in specifications, drawings and associated lists, and documents referenced therein.

Configuration Item — (1) A collection of hardware or software elements treated as a unit for the purpose of configuration management; and (2) An aggregation of hardware/software, or any of its discrete portions, that satisfies an end use function and is designated for configuration management. Configuration items may vary widely in complexity, size, and type from an aircraft, electronic, or ship system to a test meter or round of ammunition. During development and initial production, configuration items are only those specification items that are referenced directly in a contract (or an equivalent in-house agreement). During the operation and maintenance period, any repairable item designated for separate procurement is a configuration item.

Configuration Management — The process of identifying, controlling, accounting for, and auditing an information system. The configuration of a system is measured at discrete points in time to identify and control changes and to maintain the integrity and traceability of the configuration. Configuration management is also a management control mechanism to ensure system changes are within the scope of the system design and to keep track of system change status.

Configuration Accounting — The recording and reporting of the information that is needed to manage a configuration effectively, including a listing of the approved configuration identification, the status of proposed changes to the configuration, and the implementation status of approved changes.

Production Library — A software library containing formally released versions of software and documentation.

Product — The hardware and software that are required for an application to operate.

Product Baseline — The state of hardware and software for an application and its associated documentation as it exists in the current production environment.

Release Package — A package containing all the components required to deliver a complete product release to the field, including release notification, release notes, installation notes, documentation, and software.

System/Software Change Request (SCR) — The form that is used to report a software or hardware problem or to request ADP support from computer operations.

Software Library — A controlled collection of software and related documentation designed to aid in software development, use, or maintenance. Types include software development library, master library, production library, program library, and software repository.

1.4.2 Acronyms and Glossary

The following abbreviations and acronyms are used throughout this document.

ANSI	American National Standards Institute
ATMS	Automated Transportation Management System
IEEE	Institute of Electrical and Electronics Engineers
CCB	Change Control Board
CMP	Configuration Management Plan
IRM	Information Resource Management (Division of Westinghouse Hanford Company)
RCR	Review Comment Record
SCM	Software Configuration Management
SCR	System/Software Change Request
SDD	Software Design Description
SRS	Software Requirements Specification
V&V	Verification and Validation

1.5 REFERENCES

- WHC, 1988, Standard Engineering Practices WHC-CM-6-1, Engineering Change Notice, Section EP-2.2: Engineering Document Change Control.
- WHC, 1989, IRM Project Management, WHC-CM-3-2, Project Change Management, procedure 2.0100.07, and Change Control Guidelines for Production On-Line Applications, procedure 2.2015.
- WHC, 1993, Software Practices, WHC-CM-3-10, Configuration Control, Section 6.0, Westinghouse Hanford Company, Richland, Washington.

2.0 MANAGEMENT

2.1 RESPONSIBILITIES

The Technical Project Manager is responsible for administering ATMS configuration management. ATMS configuration management is divided into two phases:

- 1) Development phase: Software is controlled through release to the ATMS development library for acceptance testing. The Technical Project Manager acts as the software librarian controlling the release of the software during this phase. Hardware configuration is controlled through release memo to the development sites. The Technical Project Manager acts as the focal point to coordinate similar configuration on all development platforms.
- 2) Production phase: ATMS software configuration management is controlled by the ATMS change control board (CCB) and IRM operations production procedures. The ATMS CCB controls the approval of modifications to the ATMS software when the software will be transferred to production. An assigned Project Librarian will control the physical release and coordination of the release. ATMS hardware configuration management will be addressed in a later release of this document.

The general responsibilities of the Technical Project Manager during the development phase of configuration management are to ensure the Software Requirement Specification (SRS) are developed in the software system as it is written, and to capture the as-built documentation, test data, reports, and code for the system.

Specific organizational responsibilities of the SCM coordinators are as follows:

- Maintain a stable development environment.
- Establish naming conventions
- Approve change requests and plans
- Prepare necessary status reports and monitor project status
- Conduct regular reviews.

2.2 INTERFACE CONTROL

This SCM plan interfaces with the following plans:

- Test Plan WHC-SD-TP-TP-004
- Implementation Plan WHC-SD-TP-SWD-003
- Documentation Plan WHC-SD-TP-PLN-007

2.3 IMPLEMENTATION

This SCM plan has the following implementation schedule for when items first become configuration items:

1. December, 1992 - ATMS V2.0 Functional Requirements Document
2. January, 1993 - ATMS V2.0 Data Requirements Document
3. March, 1993 - ATMS V2.0 Implementation Plan
4. May, 1993 - ATMS V2.0 Configuration Management Plan
5. May, 1993 - ATMS V2.0 Security Plan
6. June, 1993 - ATMS V2.0 Quality Assurance Plan
7. August, 1993 - ATMS V2.0 Training Plan
8. September, 1993 - ATMS V2.0 Documentation Plan
9. September, 1993 - ATMS V2.0 Verification and Validation Plan
10. December, 1993 - ATMS V1.0 Released Software
11. December, 1993 - ATMS V1.0 Users Manual
12. April, 1994 - ATMS V2.0 Test Plan
13. April, 1994 - ATMS V2.0 Test Materials
14. Fiscal Year 1994 - ATMS released software, and the initiation of the ATMS Change Control Board

2.4 POLICIES AND PROCEDURES

The following procedures will be followed for all documents, software, etc., named in this plan as configuration items.

- Engineering Document Change Control, Section EP-2.2, Standard Engineering Practices, WHC-CM-6-1 (WHC 1988)
- Project Change Management, procedure 2.0100.07; and Change Control Guidelines for Production On-Line Applications, procedure 2.2015, IRM Project Management, WHC-CM-3-2 (WHC 1989)
- Configuration Control, Software Practices, WHC-CM-3-10 (WHC 1993) , SP-6.0; Document Control, SP-6.1; Software Control, SP-6.2; Change Requests and Problem Reports, SP-6.3; and Document Approvals, SP-6.4.

3.0 SOFTWARE CONFIGURATION MANAGEMENT ACTIVITIES

3.1 CONFIGURATION IDENTIFICATION

This section describes how ATMS documents and software will be identified.

3.1.1 Document Identification

All ATMS documents will be named in accordance with the instructions outlined in Standard Engineering Practices, WHC-CM-6-1, Section EP-1.12 or in accordance with DOE document numbering practices. The person preparing a supporting document requests an identification number from a Configuration Documentation Work Station operator. The ATMS document numbering convention for documents without a DOE document number is as follows:

WHC-SD-XXX-YYY-999 Rev. Z

- WHC - identifies the DOE contractor
- SD - identifies the document as a Supporting Document
- XXX - identifies the program indicator (e.g., WM for Waste Management, or TP for Transportation and Packaging)
- YYY - identifies the supporting document type
- 999 - identifies the unique document number
- Z - identifies the revision number of the document

3.1.2 Software Identification

All ATMS software will be named in accordance with WHC Software Practices, WHC-CM-3-10, Section SP-6.2. The ATMS naming convention is as follows:

XXYZZZZ.999

- XX - identifies the name of the module
- Y - identifies the module as
 - M - for a menu identifier
 - D - for a display identifier
 - U - for a update identifier
 - R - for a report identifier
- ZZZZ - sequential number for unique identification
- 999 - sequential version number (only used when archiving unused code in a file structure)

3.2 CONFIGURATION CONTROL

Baselines are established by the DOE headquarters program manager's approval of the document. ATMS will utilize a change control board after the system enters the production environment. The purpose of the CCB is to decide approval/disapproval and priority appointment of technical changes to ATMS. Technical changes can be requested by use of an SCR from (figure 1), or by employing the error reporting module within the ATMS software.

Software Change Request/Problem Report

SCR/PR Number: _____

1. Software/Document Identification (Name): _____

Rev: _____

2. Prepared by: _____

Date: _____

System Name: _____

TCPN, W/O: _____

3. SCR/PR Type: Change Request Problem Report

Requested Completion Date: _____

4. Description:

5. Justification if Change Request:

6. Submitter's Priority High Medium Low

7. Change Authority: _____ Accept Modify Reject Defer Until: _____

8. Assigned to: _____

Planned Release Date: _____

9. Solution Comments

Cost/Schedule Estimate: _____ / _____

10. Software/Documents Affected:

11. Approvals Indicate SCR is Complete or PR is Resolved:

Software Developer: _____

Date: _____

Cognizant Manager: _____

Date: _____

SCR or PR Preparer: _____

Date: _____

Other: _____

Date: _____

Mail to: ATMS Project Manager/ATMS CCB • BCS Richland, Inc. • P.O. Box 300 MS B5-25 • Richland WA 99352-3562

(Figure 1)

3.3 CONFIGURATION ACCOUNTING

Accounting for change is accomplished by tracking the changes to modules on the change control log located with the hard copy print out of the code. The software unit development folders will contain a copy of a change control log. As software modules are generated, a copy of the source code will be placed in the unit development folders and duly noted on the log. Modules which are changed or modified will have updated source code listings placed in the unit development folders and appropriately documented on the change control log as to version and the nature of the change. During ATMS development, the Technical Project Manager will regularly check to ensure the folders and change control logs for any modifications are being created and maintained. Once released into production the change control log will be used to formally prepare all required engineering change notices as required.

After the initial alpha release of the ATMS change requests or problems will be reported using a change request form. Change requests to the development programs will be reported to the Technical Project Manager on a weekly basis. When the software is beta released for formal release testing, the release and version number are recorded along with the current change level. In addition, the Technical Project Manager will oversee the project through regular weekly status reports from development team members.

3.4 AUDITS AND REVIEWS

To ensure proper execution of procedures in support of the configuration management function, and to identify any areas in the procedures that require modifications, the Technical Project Manager should conduct periodic informal reviews and audits.

The Audits and Reviews procedure should be conducted to measure the proper execution of activities relative to the control and processing of change requests. Included in these informal reviews should be a periodic assessment of the interfaces occurring with development team activities to ensure their adherence to sound Configuration Management procedures. This procedure also involves comparing the physical contents of the ATMS products running in the production environment (i.e., software, documentation) to the records maintained in the CM Library. This will ensure the effectiveness of library controls and the integrity of library contents.

3.5 ACCESS CONTROL

Access to ATMS software and data will be controlled through the use of passwords. Further details about the access control plan can be found in the ATMS System Security Plan. Since ATMS hardware typically consists of personal computers at the local site that are used for other purposes, access to the hardware will not be controlled.

3.6 BACKUP AND RECOVERY

Computer equipment, software, and data are susceptible to damage, loss, or destruction. To protect ATMS from such risks, a backup and recovery procedure has been established and is contained within the ATMS System Security Plan.

4.0 TOOLS, TECHNIQUES, AND METHODOLOGIES

Configuration management procedures will be used to monitor and control the release of ATMS software and documentation into production libraries. Deployment of software will be performed using similar control procedures.

5.0 SUPPLIER CONTROL

Contract-developed software will form the basis of ATMS. The subcontractor will be responsible for releasing software in accordance with this SCM Plan.

6.0 RECORDS COLLECTION AND RETENTION

Status reports will be maintained as a historical record for the ATMS project in the project notebook. All test data, test procedures, and test results will be maintained and saved for use in defining the production system, including the software unit development folders and associated change control logs. Baseline code, test data and reports will be maintained at the termination of the project for two years. All associated documentation will be maintained in the Records Holding Area for a two-year period.

7.0 HARDWARE CONFIGURATION MANAGEMENT ACTIVITIES

7.1 Hardware Configuration Identification

This section describes how ATMS V1.0 and V2.0 hardware will be configuration controlled.

7.2 ATMS V1.0 Hardware

The minimum hardware configuration to use ATMS V1.0 is as follows:

- 386-25MHz IBM compatible,
- 2MB RAM,
- 3 1/2 inch floppy drive,
- 9600 Baud modem (bits, stop/bit, XON/XOFF, Parity check, even/odd).

Software will be able to be loaded by personnel at the requesting site following simple installation procedures.

7.3 ATMS V2.0 Hardware

During the development phase of the project the initial configuration of the development platforms will be done at one site. The deployment of development hardware to remote development sites will require close communications between the operational system managers to document and test any configuration changes away from the initial configuration. This documentation will be used to and in the installation of similar hardware at other sites. Site specific configuration changes will be supported but must be approved by the ATMS Change Control board.